	PROF. SAMBHAJIRAO KADAM COLLEGE, DEUR (Satara)
	Criterion 1: Curricular Aspects
	Clarifications for deviation/s along with attached document/s for DVV
	1.3.2
	Document showing the experimental learning through project work/field work/internship as prescribed by the affiliating university curriculum

Sr. No.	Course-wise curriculum
1	Marathi- B.A. 3- Sem. 5&6
2	English- B.A. 3-Sem. 5&6
3	Hindi- B.A. 3-Sem. 5&6
4	Economics- B.A. 3-Sem. 5&6
5	History- B.A. 3-Sem. 5&6
6	B.Com 3 All-Sem. 5&6
7	Botany- B. Sc. 2- Sem. 3&4 CBCS
8	Botany- B. Sc. 3- Sem. 5&6 CBCS
9	Chemistry- B. Sc. 2- Sem. 3&4 CBCS
10	Chemistry- B. Sc. 3- Sem. 5&6 CBCS
11	English Comp- B. Sc. 3- Sem. 5&6 CBCS
12	Environment Science- B.Sc. 2- Sem.
13	Physics- B. Sc. 2- Sem. 3&4 CBCS
14	Physics- B. Sc. 3- Sem. 5&6 CBCS
15	Statistics- B. Sc. 3- Sem. 5&6 CBCS
16	Zoology- B. Sc. 3- Sem. 5&6 CBCS
17	Food Processing Preservation- Certificate
18	Beauty Wellness Certificate & Diploma
19	Food Processing & Preservation

SHIVAJI UNIVERSITY, KOLHAPUR

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Accredided by NAAC 'A' Grade

Revised Syllabus for

Bachelor of Arts

B.A. Part-III - MARATHI

CHOICE BASED CREDIT SYSTEM

(Syllabus will be implemented from June, 2020)

शिवाजी विद्यापीठ, कोल्हापूर
SHIVAJI UNIVERSITY, KOLHAPUR
मराठी अभ्यास मंडळ
Board of Studies in Marathi
पसंतीवर आधारित श्रेयांक पद्धती
Choice Based Credit System
बी.ए. भाग-३ (मराठी) : B.A. Part-III (Marathi)
अभ्यासक्रम : Syllabus
Introduced from June 2020 onwards

समकक्षता / Equivalence

सत्र क्र. Sem.	अभ्यास–पत्रिका क्र. Paper No.	जुना अभ्यासक्रम अभ्यासपत्रिकेचे नाव	अभ्यास–पत्रिका क्र. Paper No.	नवा अभ्यासक्रम अभ्यासपत्रिकेचे नाव
V	VII	काव्यशास्त्र	VII	साहित्यविचार
V	VIII	भाषाविज्ञान आणि मराठी भाषा	VIII	मराठी भाषा व भाषाविज्ञान
V	IX	मराठी वाङ्मयाचा इतिहास	IX	मध्ययुगीन मराठी वाङ्मयाचा इतिहास (प्रारंभ ते इ.स.१५००)
V	X	मराठी भाषा : उपयोजन आणि सर्जन	X	मराठी भाषा व अर्थार्जनाच्या संधी
V	XI	वाङ्मयप्रवाहांचे अध्ययन (ग्रामीण साहित्य)	XI	वाङ्मयप्रवाहाचे अध्ययन : मध्ययुगीन
VI	XII	काव्यशास्त्र	XII	साहित्यविचार
VI	XIII	भाषाविज्ञान आणि मराठी भाषा	XIII	मराठी भाषा व भाषाविज्ञान
VI	XIV	मराठी वाङ्मयाचा इतिहास	XIV	मध्ययुगीन मराठी वाङ्मयाचा इतिहास (इ.स.१५०० ते १८००)
VI	XV	मराठी भाषा : उपयोजन आणि सर्जन	XV	मराठी भाषा व अर्थार्जनाच्या संधी
VI	XVI	वाङ्मयप्रवाहांचे अध्ययन (दलित साहित्य)	XVI	वाङ्मयप्रकाराचे अध्ययन : ललित गद्य (व्यक्तिचित्रे)

सूचना : १. सत्र पाच (V) साठी विद्यापीठाने प्रत्येक अभ्यासपत्रिकेनुरूप अंतर्गत मूल्यमापनासाठी १० गुणांसाठी सेमिनार सुचविला आहे. सदर सेमिनारसाठी त्या त्या अभ्यासपत्रिकेच्या अभ्यासक्रमानंतर सेमिनार विषय दिले आहेत. त्यापैकी एका विषयावर प्रत्येक विद्यार्थ्याने सादरीकरण करणे आवश्यक आहे. त्यामध्ये विषयानुसार उद्दिष्टे, प्रास्ताविक, विषयविवेचन, निष्कर्ष आणि संदर्भ या सूत्रानुरूप सादरीकरण गरजेचे आहे. ज्या विषयावर सेमिनार दिला आहे त्याची टिपणे विद्यार्थी व संबंधित विषय शिकविणाऱ्या शिक्षकाच्या स्वाक्षरीसह महाविद्यालयाच्या विभागात जतन करून ठेवणे आवश्यक आहे.

२. सत्र सहा (VI) साठी विद्यापीठाने प्रत्येक अभ्यासपत्रिकेनुरूप अंतर्गत मूल्यमापनासाठी १० गुणांचा गटप्रकल्प (Group Project) सूचविला आहे. सदर गटप्रकल्पासाठी त्या त्या अभ्यासपत्रिकेच्या अभ्यासक्रमानंतर गटप्रकल्प विषय सुचविले आहेत. त्यापैकी एका विषयावर गटप्रकल्प सादर करणे आवश्यक. गटप्रकल्प तयार करताना शीर्षक, उद्दिष्टे, प्रास्ताविक, गहीतके, विषयाचे महत्त्व, विषयविवेचन, निष्कर्ष आणि संदर्भ या क्रमाने गटप्रकल्प तयार करावा. एका गटप्रकल्पासाठी कमाल ५ विद्यार्थी मर्यादा असावी. ज्या विषयावर गटप्रकल्प तयार केला आहे; त्यावर गटप्रकल्पकांची व संबंधित विषय शिकविणाऱ्या शिक्षकांची स्वाक्षरी घेऊन सदर प्रकल्प विभागात जतन करून ठेवावेत.

३. सेमिनार व गटप्रकल्पसंदर्भात विषयाची निवड करताना विद्यापीठाने सूचित केलेल्या विषयाबरोबर त्या त्या अभ्यासपत्रिकेनुरूप आणखी काही नावीन्यपूर्ण विषयांची निवड करण्यास स्वातंत्र्य दिले आहे.

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Choice Based Credit System

Structure of Programme

Revised syllabus B. A. Part III (MARATHI)

Introduced from June 2020 onwards

Sr.No.	सत्र क्र. Sem.	अभ्यासपत्रिकेचे नाव	अभ्यास–पत्रिका क्र. Paper No.	Worklaod	Credits	Total Credits	Theory Marks	Term work/ Seminar
1	V	साहित्यविचार	VII	4 lectures/ week	4		40	10
2	V	मराठी भाषा व भाषाविज्ञान	VIII	4 lectures/ week	4		40	10
3	V	मध्ययुगीन मराठी वाङ्मयाचा इतिहास (प्रारंभ ते इ.स.१५००)	IX	4 lectures/ week	4	20	40	10
4	V	मराठी भाषा व अर्थार्जनाच्या संधी	X	4 lectures/ week	4		40	10
5	V	वाङ्मयप्रवाहाचे अध्ययन : मध्ययुगीन	XI	4 lectures/ week	4		40	10

Sr.No.	सत्र क्र. Sem.	अभ्यासपत्रिकेचे नाव	अभ्यास–पत्रिका क्र. Paper No.	Worklaod	Credits	Total Credits	Theory Marks	Term work/ Group project
6	VI	साहित्यविचार	XII	4 lectures/ week	4		40	10
7	VI	मराठी भाषा व भाषाविज्ञान	XIII	4 lectures/ week	4		40	10
8	VI	मध्ययुगीन मराठी वाङ्मयाचा इतिहास (इ.स.१५०० ते १८००)	XIV	4 lectures/ week	4	20	40	10
9	VI	मराठी भाषा व अर्थार्जनाच्या संधी	XV	4 lectures/ week	4		40	10
10	VI	वाङ्मयप्रकाराचे अध्ययन : ललितगद्य (व्यक्तिचित्रे)	XVI	4 lectures/ week	4		40	10

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पसंतीवर आधारित श्रेयांक पद्धती

Choice Based Credit System

बी.ए. भाग-३ : B.A. Part-III

अभ्यासक्रम : Syllabus

June, 2020 onward

सत्र-५ : Semister No. V : अभ्यासपत्रिका क्र. VII

Discipline Specific Elective (DSE-E1)

विद्याशाखीय विशेष निवड (DSE-E1)

साहित्यविचार

उद्दिष्टे :

१. पौर्वात्य, पाश्चात्य व आधुनिक भारतीय साहित्यशास्त्राचे स्वरूप समजून घेणे.

२. ललित व ललितेतर साहित्याचे स्वरूप समजून घेणे.

३. साहित्य प्रयोजनांचे आकलन करून घेणे.

४. साहित्याची निर्मितिप्रक्रिया आणि त्याचे स्वरूप आकलन करून घेणे.

५. भाषेतील अलंकार समजून घेणे.

अभ्यासक्रम

अ. क्र. Sr. No.	घटक Topic	अध्यापन तासिका Teaching Hours	श्रेयांक Credit
विभाग १ Module I	**साहित्याचे स्वरूप** ■ साहित्याच्या व्याख्या ● **पौर्वात्य** – भामह, मम्मट, आनंदवर्धन, विश्वनाथ **पाश्चात्य** – वर्डस्वर्थ, कोट्हॉप, मॅथ्यू अर्नोल्ड, कार्लाइल ● **आधुनिक** – विनोबा भावे, अ. वा. कुलकर्णी, गंगाधर गाडगीळ, वि. ना. ढवळे, ■ ललित व ललितेतर साहित्य ■ ललित साहित्यातून व्यक्त होणाऱ्या अनुभवांचे विशेष– संवेदनात्मकता, भावनात्मकता, वैचारिकता, सेंद्रियता, सूचकता, विशिष्टता, विश्वात्मकता	१५	१

विभाग २ Module 2	**साहित्याचे प्रयोजन** ● प्रयोजन म्हणजे काय ? ● प्रयोजन आणि परिणाम यातील फरक ■ साहित्याची प्रयोजने : १) यश किंवा कीर्ती २) व्यवहारज्ञान ३) आनंद ४) उद्बोधन ५) आत्माविष्कार ६) जिज्ञासापूर्ती ७) जीवनानुभूती ८) इच्छापूर्ती अथवा स्वप्नरंजन ९) पलायनवाद (Escapism)	१५	१
घटक ३ Module 3	**साहित्यनिर्मितीची कारणे** ● साहित्यनिर्मितीचे स्वरूप ● साहित्यनिर्मितीची कारणे १) प्रतिभा – स्वरूप व वैशिष्ट्ये (प्रतिभाव्यापार, प्रतिभेचे अलौकिकत्व, अपूर्वनिर्मितिक्षम प्रतिभा, प्रतिभा ही वेडाची बहीण) २) बहुश्रुतता ३) अभ्यास ४) भावनात्मकता ५) संवेदनशीलता ६) उत्प्रेक्षा ७) चमत्कृती ८) स्वास्थ्य (शारीरिक, मानसिक) ९) साहित्यिकाचा जीवनविषयक दृष्टिकोण	१५	१
घटक ४ Module 4	**अलंकार** १) अतिशयोक्ती २) स्वभावोक्ती ३) दृष्टान्त ४) उपमा ५) अनुप्रास ६) रूपक (व्याख्या, स्वरूप आणि उदाहरणे अपेक्षित)	१५	१

❊ प्रशनपत्रिकेचे स्वरूप व गुणविभागणी ❊

Pattern of Question Paper

एकूण गुण – ४० : Total Marks-40

प्रश्न १	योग्य पर्याय निवडा	०५ गुण
प्रश्न २	अंतर्गत विकल्पासह दीर्घोत्तरी प्रश्न	१५ गुण
प्रश्न ३	अंतर्गत विकल्पासह लघूत्तरी प्रश्न (तीन पैकी दोन)	१० गुण
प्रश्न ४	अलंकार (चार पैकी दोन)	१० गुण

सूचना :

१. विभाग चार वर वस्तुनिष्ठ प्रश्न असणार नाहीत.

२. अंतर्गत मूल्यमापनाकरिता सेमिनारसाठी दहा गुण आहेत.

सेमिनार विषय :

- विविध साहित्य प्रवाहातील कोणत्याही एका साहित्यकृतीचे किंवा अनुवादित साहित्यकृतीचे परीक्षण करून सादरीकरण करणे.
- कोणत्याही भाषेतील एका चित्रपट वा नाटकाचे परीक्षण करून सादरीकरण करणे.

मूलभूत वाचन :

१. जोग, रा. श्री.   *अभिनव काव्यप्रकाश, व्हीनस प्रकाशन, पुणे, आवृत्ती ७ वी, १९७५*

२. गाडगीळ, स. रा.   *काव्यशास्त्रप्रदीप, व्हीनस प्रकाशन, पुणे, आवृत्ती ४ थी, जानेवारी, १९९३*

३. गोविलकर, लीला   *भारतीय साहित्यविचार, स्नेहवर्धन, पुणे, २००३*

४. वाळंबे, मो. रा.   *सुगम मराठी व्याकरण, नितीन प्रकाशन, पुणे*

५. देशपांडे, अ. ना. (संपा.)   *विनोबांची साहित्यदृष्टी, परमधाम प्रकाशन, पवनार, वर्धा, १९७५*

६. कुलकर्णी, अ. वा.   *साहित्यविचार, प्रतिमा प्रकाशन, पुणे, आ.दु. १९९७*

७. गाडगीळ, गंगाधर   *खडक आणि पाणी, पॉप्युलर प्रकाशन, मुंबई, १९६०.*

८. ढवळे, वि. ना.   *साहित्याचे तत्त्वज्ञान, कॉन्टिनेन्टल प्रकाशन, पुणे*

पूरक वाचन :

१. उपासे, शिवशंकर   *काव्यशास्त्र परिचय, फडके प्रकाशन, कोल्हापूर, २०१३*

२. कंगले, र. पं.   *प्राचीन काव्यशास्त्र, मौज प्रकाशन, मुंबई, १९७४*

३. देशमुख, मा. गो.   *मराठीचे साहित्यशास्त्र, (ज्ञानेश्वर ते रामदास)*

४. डॉ. नगेंद्र   *भारतीय काव्यशास्त्राचे मूळ प्रश्न, सुविचार, नागपूर, पुणे, १९६७*
   (अनुवादक : शैलजा करंदीकर)

संदर्भ ग्रंथ :

१. जाधव, उदय   *काव्यशास्त्र : आकलन आणि आस्वाद, लोकपाल पब्लिकेशन, औरंगाबाद प्रथमावृत्ती, ५ सप्टेंबर, २०१३*

२. पुंडे, दत्तात्रय व   *साहित्य विचार, स्नेहवर्धन प्रकाशन, पुणे, प्रथमावृत्ती, फेब्रुवारी, १९९५*
   तावरे, स्नेहल (संपा.)

३. पाटील, म. सु.   *भारतीयांचा साहित्यविचार, चेतश्री प्रकाशन, अमळनेर*

४. वासमकर, वि. दा.   *मराठीतील कलावादी समीक्षा, अक्षरदीप प्रकाशन, कोल्हापूर, आ. प. २०१८*

५. करंदीकर, गो. वि.   *ऑरिस्टॉटलचे काव्यशास्त्र, पॉप्युलर प्रकाशन, मुंबई*

६. जाधव, मा. मा.   *अक्षरगाथा (मराठी साहित्यविचार विशेषांक) मासिक, नांदेड, एप्रिल, २०१४*

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Board of Studies in Marathi
पसंतीवर आधारित श्रेयांक पद्धती
Choice Based Credit System
बी.ए. भाग-३ : B.A. Part-III
अभ्यासक्रम : Syllabus
June, 2020 onward
सत्र-५ : Semister No. 5 : अभ्यासपत्रिका क्र. VIII
Discipline Specific Elective (DSE-E2)
विद्याशाखीय विशेष निवड (DSE-E2)

मराठी भाषा व भाषाविज्ञान

उद्दिष्टे :

१. भाषोत्पत्तीचा अभ्यास करणे.

२. भाषाविज्ञानाचा परिचय करून घेणे.

३. भाषाविज्ञान आणि मराठी भाषा यांचा सहसंबंध जाणून घेणे.

४. स्वनविचार, रूपविचार व वाक्यविचारांचा परिचय करून घेणे.

५. मराठी भाषेविषयी विद्यार्थ्यांची आवड विकसित करणे.

अभ्यासक्रम

अ. क्र. Sr. No.	घटक Topic	अध्यापन तासिका Teaching Hours	श्रेयांक Credit

विभाग १
 Module I
	भाषोत्पत्ती विचार
	 ● भाषेची उत्पत्ती – ईश्वरनिर्मित, राजनिर्मित, समाजनिर्मित
	 ● भाषेच्या उत्पत्तीच्या उपपत्ती/सिद्धांत
	     १. इंगित (Gesture)
	     २. मुखाभिनय (Oral Gesture)
	     ३. अनुकरण (Bow-Bow)
	     ४. रणन (Ding Dong)
	     ५. भावनाभिव्यक्ती (Pooh-Pooh)
	     ६. श्रमपरिहार (Yo-he-Yo)
	     ७. प्रेमगानमूलक (Sing-Song)
	     ८. संपर्क (Contact)
	     ९. क्रीडासक्ती (Play-Way)
	     १०. समन्वय उपपत्ती/सिद्धांत
		१५	१

विभाग २ Module II	भाषेचे स्वरूप, व्याख्या आणि वैशिष्ट्ये ● भाषा म्हणजे काय ? ● भाषेच्या व्याख्या : कृ. पां. कुलकर्णी, ना. गो. कालेलकर, श्री. न. गजेंद्रगडकर ● भाषेचे स्वरूप : समाजव्यवहाराचे साधन, ध्वनिमाध्यमता, प्रतीकात्मकता, संकेतबद्धता, भाषा – एक पद्धती, भाषा मानवी आहे. ● सी. एफ. हॉकेटने सांगितलेली भाषेची सात वैशिष्ट्ये दुहेरीपण, निर्मितिक्षमता, कार्यकारण संबंधाचा अभाव, यादृच्छिकता, अदलाबदलीची शक्यता, विशिष्टीकरण, स्थलकालातीतता, सांस्कृतिक संक्रमण या शिवाय – सामाजिक संस्था, अर्जित भाषा, परिवर्तनशीलता, रैखिकता इ. वैशिष्ट्यांचा विचार	१५	१

विभाग ३ Module III	स्वनिम व रूपिम विचार (स्थूल परिचय) अ. स्वनिम विचार १. स्वन २. स्वनिम ३. स्वनांतर (संकल्पना,स्वरूप,प्रकार) ब. रूपिम विचार १. रूप २. रूपिम ३. रूपिकांतर (संकल्पना,स्वरूप,प्रकार)	१५	१
विभाग ४ Module IV	वाक्यविचार ● पदबंध व वाक्याचे स्वरूप ● वाक्याचे प्रकार केवलवाक्य व त्याचे प्रकार, मिश्रवाक्य व त्याचे प्रकार, संयुक्त वाक्य व त्याचे प्रकार, वाक्याचे पृथक्करण	१५	१

एकूण गुण – ४० : Total Marks-40

प्रश्न १	योग्य पर्याय निवडा	०५ गुण
प्रश्न २	अंतर्गत विकल्पासह दीर्घोत्तरी प्रश्न	१५ गुण
प्रश्न ३	अंतर्गत विकल्पासह लघूत्तरी प्रश्न (तीन पैकी दोन)	१० गुण
प्रश्न ४	टिपा लिहा (चार पैकी दोन)	१० गुण

सूचना :

१. अंतर्गत मूल्यमापनाकरिता सेमिनारसाठी दहा गुण आहेत.

सेमिनार विषय :

१. स्वन–स्वनिम, रूप–रूपिम पैकी कोणत्याही एका घटकाच्या अनुषंगाने प्रात्यक्षिकांसह सादरीकरण अपेक्षित.

२. कोणत्याही एका साहित्यकृतीच्या निवडक भागातील वाक्यांचे प्रकार, पृथक्करण, विश्लेषणासह सादरीकरण अपेक्षित.

मूलभूत वाचन :

१. जोशी, प्र. न.   *सुबोध भाषाशास्त्र, स्नेहवर्धन प्रकाशन, पुणे*

२. गवळी, अनिल   *भाषाविज्ञान आणि मराठी भाषा, हिरण्यकेशी प्रकाशन, कोल्हापूर*

३. धोंगडे, रमेश   *भाषा आणि भाषाविज्ञान, दिलीपराज प्रकाशन, पुणे*

४. कानडे, मु. श्री. (संपा.) *मराठीचा भाषिक अभ्यास, स्नेहवर्धन प्रकाशन, पुणे*

५. गजेंद्रगडकर, श्री. न.   *भाषा आणि भाषाशास्त्र, व्हीनस प्रकाशन, पुणे*

६. हिरेमठ, राजशेखर   *मराठी व्याकरण परिचय, मेहता पब्लिशिंग हाऊस, पुणे*

७. Hocket C.F.   A course in Modern Linguistics, Oxford, New York, 1958

पूरक वाचन :

१. कुलकर्णी, कृ. पां.   *मराठी भाषा : उद्गम आणि विकास, मेहता पब्लिशिंग हाऊस, पुणे*

२. मालशे, मिलिंद   *आधुनिक भाषाविज्ञान : सिद्धांत आणि उपयोजन, लोकवाङ्मयगृह,मुंबई*

३. कुलकर्णी, सुलक्षणा व   *भाषाविज्ञान परिचय, फडके प्रकाशन, कोल्हापूर*
    कुबेर, वसंत

४. दामले, मो. के.   *शास्त्रीय मराठी व्याकरण, दामोदर सावळाराम आणि मंडळी, पुणे*

संदर्भ ग्रंथ :

१. मालशे, पुंडे, सोमण (संपा.)   *भाषाविज्ञानपरिचय, पद्मगंधा प्रकाशन, पुणे*

२. पुंडे, द. दि.   *सुलभ भाषाविज्ञान, स्नेहवर्धन प्रकाशन, पुणे*

३. कदम, महेंद्र   *मराठीचे वर्णनात्मक भाषाविज्ञान, स्नेहवर्धन प्रकाशन, पुणे*

४. काळे, कल्याण/सोमण, अंजली (संपा.) *आधुनिक भाषाविज्ञान, प्रतिमा प्रकाशन, पुणे*

५. पाटील, व्ही. एन.   *सुलभ भाषाविज्ञान व मराठी व्याकरण, प्रशांत पब्लिकेशन्स, जळगाव,*
                                   आ.दु. २, २०१६

६. भांड, बाबा व मगर, राजेंद्र   *भाषा आणि साहित्य, माझी भूमिका : सयाजीराव गायकवाड, महाराजा*
                             सयाजीराव गायकवाड संशोधन व प्रशिक्षण संस्था, औरंगाबाद,२०२०

७. लामतुरे, प्रज्ञा   *ग्रामीण बोलीभाषेचे वैभव, संस्कृती प्रकाशन, पुणे, २०१२*

८. जाधव, मा. मा. (संपा.)   *अक्षरगाथा (मराठी भाषा विशेषांक), मासिक, नांदेड, ऑक्टोबर, २०१३*

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मराठी अभ्यास मंडळ
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अभ्यासक्रम : Syllabus
June, 2020 onward
सत्र-५ : Semister No. 5 : अभ्यासपत्रिका क्र. IX
Discipline Specific Elective (DSE-E3)
विद्याशाखीय विशेष निवड (DSE-E3)
मध्ययुगीन मराठी वाङ्मयाचा इतिहास (प्रारंभ ते इ.स.१५००)

उद्दिष्टे :

१. मध्ययुगीन मराठी वाङ्मयाचा कालिक अभ्यास करणे.

२. मध्ययुगीन मराठी वाङ्मयाचा स्थूल परिचय करून घेणे.

३. मध्ययुगीन मराठी वाङ्मयाचे स्वरूप, वैशिष्ट्ये अभ्यासणे.

४. मध्ययुगीन मराठी वाङ्मयातील महत्त्वाचे ग्रंथकार आणि ग्रंथ यांचा स्थूल परिचय करून घेणे.

५. मध्ययुगीन मराठी वाङ्मयाच्या गद्य, पद्य रचनेचे विशेष अभ्यासणे.

अभ्यासक्रम

अ. क्र. Sr. No.	घटक Topic	अध्यापन तासिका Teaching Hours	श्रेयांक Credit
विभाग १ Module I	■ मराठी वाङ्मयाचा प्रारंभकाळ ते इ.स. १२०० पर्यंत अ) विवेकसिंधूपूर्वकालीन रचना कुवलयमाला, मानसोल्लास, राजमतिप्रबोध, अमरनाथ संवाद, गोरक्षगीता इ. ब) मराठीतील आद्य ग्रंथकार मुकुंदराज यांची रचना विवेकसिंधू, पवनविजय, परमामृत क) मराठीतील आद्य कवयित्री महदंबा यांची रचना धवळे (पूर्वार्ध व उत्तरार्ध), मातृकी रुक्मिणीस्वयंवर	१५	१
विभाग २ Module II	■ इ. स. १२०० ते १३०० (स्थूल कालखंड) अ) महानुभावीय गद्य वाङ्मय म्हाइंभट – लीळाचरित्र, श्री. गोविंदप्रभूचरित्र व इतर रचना केसोबास – सूत्रपाठ, दृष्टांतपाठ, स्मृतिस्थळ	१५	१

अ. क्र. Sr. No.	घटक Topic	अध्यापन तासिका Teaching Hours	श्रेयांक Credit
विभाग २ Module II	ब) महानुभावीय पद्य वाङ्मय सातीग्रंथ (ग्रंथ व ग्रंथकार स्थूल परिचय) नरेंद्र – रुक्मिणी स्वयंवर भास्करभट्ट बोरीकर – शिशुपालवध, उद्भवगीता किंवा एकादशस्कंध दामोदर पंडित – वछाहरण पंडित विश्वनाथ – ज्ञानप्रबोध रवळोव्यास – सह्याद्रिवर्णन नारायणपंडित – श्री ऋद्धिपूरवर्णन	१५	१
विभाग ३ Module III	इ. स. १३०० ते १४०० (स्थूल कालखंड) अ) ज्ञानेश्वरांचे वाङ्मयीन कार्य ज्ञानेश्वरी, अमृतानुभव, चांगदेवपासष्टी, हरिपाठाचे अभंग व इतर रचना ब) नामदेवांची अभंगरचना क) सावता माळी, गोरोबा कुंभार, मुक्ताबाई, सेना महाराज, नरहरी सोनार, चोखामेळा, जनाबाई, कान्होपात्रा यांच्या रचना	१५	१
विभाग ४ Module IV	इ. स. १४०० ते १५०० (स्थूल कालखंड) अ) अन्य संप्रदायातील प्रमुख ग्रंथकार आणि त्यांची ग्रंथरचना सत्यमालनाथ, चोंभा (नाथ संप्रदाय) शांतलिंग आणि मन्मथशिवलिंग (लिंगायत संप्रदाय) गुणकीर्ती व जिनदासनामा (जैन मराठी कवी) नृसिंह सरस्वती आणि दासोपंत (दत्त संप्रदाय) अज्ञानसिद्ध व बहिराजातवेद (नागेश संप्रदाय) शेख महंमद आणि हुसेन अंबरखान (मुस्लीम मराठी कवी) फादर स्टिफन्स, फादर क्रुवा (ख्रिस्ती मराठी कवी)	१५	१

❊ प्रश्नपत्रिकेचे स्वरूप व गुणविभागणी ❊

Pattern of Question Paper

एकूण गुण – ४० : Total Marks-40

प्रश्न १	योग्य पर्याय निवडा	०५ गुण
प्रश्न २	अंतर्गत विकल्पासह दीर्घोत्तरी प्रश्न	१५ गुण
प्रश्न ३	अंतर्गत विकल्पासह लघूतरी प्रश्न (तीन पैकी दोन)	१० गुण
प्रश्न ४	टिपा लिहा (चार पैकी दोन)	१० गुण

सूचना :

१. अंतर्गत मूल्यमापनाकरिता सेमिनारसाठी दहा गुण आहेत.

सेमिनार विषय :

१) मध्ययुगीन मराठी वाङ्मयातील कोणत्याही एका ग्रंथकाराच्या रचना विशेषावर सादरीकरण.

२) कोणत्याही एका संत कवीच्या काव्यातील सामाजिकतेवर सादरीकरण.

३) कोणत्याही एका संत कवयित्रीच्या कवितेतील आत्मनिष्ठा यावर आधारित सादरीकरण.

मूलभूत वाचन :

१. नसिराबादकर, ल. रा.   *प्राचीन मराठी वाङ्मयाचा इतिहास, फडके प्रकाशन, कोल्हापूर*

२. पठाण, यू. म.   *महानुभाव साहित्य संशोधन खंड १, मराठवाडा विद्यापीठ प्रकाशन, औरंगाबाद*

३. देशपांडे, अ. ना.   *प्राचीन मराठी वाङ्मयाचा इतिहास खंड १ ते ४*

४. पांगारकर, ल. रा.   *प्राचीन मराठी वाङ्मयाचा इतिहास खंड १ ते ३, महाराष्ट्र साहित्य परिषद प्रकाशन, पुणे*

५. पसारकर, शे. दे.   *वेलू गेला गगनावरी, सुविद्या प्रकाशन, सोलापूर*

पूरक वाचन :

१. शेणोलीकर, ह. श्री.   *प्राचीन मराठी वाङ्मयाचे स्वरूप, व्हीनस प्रकाशन, पुणे*

२. पांगारकर, ल. रा.   *मराठी वाङ्मयाचा इतिहास खंड १ व २,*

३. तुलपुळे, शं. गो.   *मराठी वाङ्मयाचा इतिहास, महाराष्ट्र साहित्य परिषद, पुणे*

४. मांडवकर, भाऊ   *संत नामदेव दर्शन, सेवा प्रकाशन, अमरावती*

५. इनामदार, हे. वि. (संपा.)   *संत नामदेव काव्यसंभार आणि संत परिवार*

६. उपासे, शिवशंकर   *महाराष्ट्र भूषण सहा संत साहित्यिक, फडके प्रकाशन, कोल्हापूर, २०१२*

७. उपासे, शिवशंकर (संपा.)   *शांतलिंगकृत कर्णहंस, प्रका. शरण संस्कृती अध्ययन केंद्र, सिद्ध संस्थान मठ, निडसोसी, ता. हुक्केरी, जि. बेळगाव*

८. पसारकर, शे. दे. (संपा.)   *श्री मन्मथशिवलिंगकृत परमरहस्य, शैवभारती शोध प्रतिष्ठान, वाराणसी, २००१*

९. केलुसकर, कृष्णराव   *संत तुकाराम, साकेत प्रकाशन, औरंगाबाद*

१०. फाटक, न. र.   *श्री एकनाथ : वाङ्मय आणि कार्य, मौज प्रकाशन गृह, मुंबई*

११. परमार्ग सेवक श्री बाळकृष्णशास्त्री महानुभाव   *महानुभावपंथ, प. पू. मधुकरशास्त्री कवीश्वर, पंचकमिटी संस्थान, श्री देवदेवेश्वर, माहूर, आ. आठवी, २०१४*

संदर्भ ग्रंथ :

१. देऊळगावकर, चंद्रकांत (संपा.)   *मन्मथस्वामी व्यक्ती आणि वाङ्मय, प्रका. शैवभारती शोध प्रतिष्ठान, जंगमवाडी मठ, वाराणसी*

१. पाटील, तानाजी   *संत साहित्यातील सामाजिकता, विश्वकर्मा पब्लिकेशन, पुणे*

२. सुंठणकर, बा. र.   *महाराष्ट्रीय संतमंडळीचे ऐतिहासिक कार्य, बेळगाव*

३. सरदार, गं. बा.   *संत वाङ्मयाची सामाजिक फलश्रुती, म. सा. प. पुणे*

४. जाधव, रा. ग.   *आनंदाचा डोह, प्राज्ञ पाठशाळा मंडळ, वाई*

५. जाधव, रा. ग.   *वागर्थ, प्रतिमा प्रकाशन, पुणे*

६. कामत, अशोक व बडवे, सतीश (संपा.)   *संत नामदेवविषयक अभ्यास, आळंदी*

७. देशमुख, उषा   *मांदियाळी, माया प्रकाशन, नागपूर*

८. पाटील, सदाशिव   *तुकाराम आणि कबीर, दर्या प्रकाशन, पुणे*

९. घोणसे, शामा   *वीरशैवांचे मराठी–हिंदी वाङ्मय : एक अभ्यास, शैवभारती शोध प्रतिष्ठान, जंगमवाडी मठ, वाराणसी*

१०. प्रियोळकर, अ. का.   *मुसलमानांची जुनी मराठी कविता*

११. ढेरे, रा. चिं.   *मुसलमान मराठी संतकवी, पद्मगंधा प्रकाशन, पुणे*

१२. पठाण, यू. म.   *मुसलमान (सुफी) संतांचे मराठी साहित्य*

१३. मोरजे, गंगाधर   *मराठी ख्रिस्ती वाङ्मय, फादर स्टिफन्स ते १९६०, अहमदनगर*

१४. उपाध्ये, बाबुराव   *संत गोरा कुंभार : वाङ्मय दर्शन, स्नेहवर्धन प्रकाशन, पुणे*

१५. इर्लेकर, सुहासिनी   *संत कवी आणि कवयित्री : एक अनुबंध, स्नेहवर्धन प्रकाशन, पुणे*

१६. अक्कोळे, सुभाषचंद्र   *प्राचीन मराठी जैन साहित्य, सुविचार प्रकाशन, नागपूर*

१७. पाटंगणकर, विद्यासागर   *मराठी संत कवयित्रींचा इतिहास, साहित्य अकादमी, नवी दिल्ली*

१८. होनमाने, धनजय   *तंजावरची मराठी कीर्तनपरंपरा, स्नेहवर्धन, पुणे, २०१७*

शिवाजी विद्यापीठ, कोल्हापूर
SHIVAJI UNIVERSITY, KOLHAPUR
मराठी अभ्यास मंडळ
Board of Studies in Marathi

पसंतीवर आधारित श्रेयांक पद्धती

Choice Based Credit System

बी.ए. भाग-३ : B.A. Part-III

अभ्यासक्रम : Syllabus

June, 2020 onward

सत्र-५ : Semister No. V : अभ्यासपत्रिका क्र. X

Discipline Specific Elective (DSE-E4)

विद्याशाखीय विशेष निवड (DSE-E4)

मराठी भाषा व अर्थार्जनाच्या संधी

पाठ्यपुस्तक : मराठी भाषा व अर्थार्जनाच्या संधी (संपादन)

शिवाजी विद्यापीठ प्रकाशन, कोल्हापूर

उद्दिष्टे :

१. सर्जनशील लेखनप्रक्रिया समजून घेणे.

२. वैचारिक लेखनाचे स्वरूप अभ्यासणे.

३. शोधनिबंध व प्रकल्पलेखन कौशल्य समजून घेणे.

४. आंतरजालावरील मराठी लेखनपद्धती अभ्यासणे.

अभ्यासक्रम

अ. क्र. Sr. No.	घटक Topic	अध्यापन तासिका Teaching Hours	श्रेयांक Credit
विभाग १ Module I	सर्जनशील लेखन ■ सर्जनशील लेखन – संकल्पना व स्वरूप ● कथा – संकल्पना, स्वरूप ● कथेचे घटक ● प्रात्यक्षिकासह कथालेखन	१५	१
विभाग २ Module II	वैचारिक लेखन ● वैचारिक लेखन : संकल्पना व स्वरूप ● वैचारिक लेखनाची पद्धत ● वैचारिक लेखनाचे प्रकार ● प्रात्यक्षिकासह वैचारिक लेखन	१५	१

अ. क्र. Sr. No.	घटक Topic	अध्यापन तासिका Teaching Hours	श्रेयांक Credit

विभाग ३
Module III
	शोधनिबंध व प्रकल्पलेखन (स्थूल परिचय)
	● संशोधन : संकल्पना, स्वरूप, महत्त्व
	● संशोधनपर लेखनप्रकार परिचय
	  १. शोधनिबंध – स्वरूप व पद्धती
	  २. संशोधन प्रकल्प – स्वरूप व पद्धती
	  ३. प्रबंधिका
	  ४. प्रबंध
	● संशोधनपर लेखनाची पथ्ये व भाषा
		१५	१

विभाग ४
Module IV
	आंतरजालावरील (Internet) मराठी
	● आंतरजालावरील मराठीविषयक लेखनाचे स्वरूप
	● नोंदी लेखन, विश्वकोश, विकिपीडिया इ.
	● आंतरजालावरील मराठी संकेतस्थळांचा परिचय
	  १. राज्य मराठी विकास संस्था
	  २. महाराष्ट्र राज्य साहित्य आणि संस्कृती मंडळ
	  ३. भाषा संचालनालय
	  ४. मराठी भाषा विभाग, महाराष्ट्र शासन
	  ५. मराठी साहित्य परिषद, पुणे
	  ६. विश्वकोश मंडळ
	  ७. इतर संकेतस्थळे – साहित्य अकादमी, नॅशनल बुक ट्रस्ट, भारतीय भाषा संस्थान, म्हैसूर इ.
	● प्रात्यक्षिकासह आंतरजालावर मराठीविषयक लेखन
		१५	१

❈ प्रश्नपत्रिकेचे स्वरूप व गुणविभागणी ❈

Pattern of Question Paper

एकूण गुण – ४० : Total Marks-40

प्रश्न १	योग्य पर्याय निवडा	०५ गुण
प्रश्न २	अंतर्गत विकल्पासह दीर्घोत्तरी प्रश्न	१५ गुण
प्रश्न ३	अंतर्गत विकल्पासह लघूत्तरी प्रश्न (तीन पैकी दोन)	१० गुण
प्रश्न ४	टिपा लिहा (चार पैकी दोन)	१० गुण

सूचना : १. प्रश्न क्र. ४ मध्ये ४ पैकी २ प्रश्न उपयोजनावर आधारित असतील.

२. अंतर्गत मूल्यमापनाकरिता सेमिनारसाठी दहा गुण आहेत.

सेमिनार विषय :

१. भाषा, साहित्य, संस्कृती व माध्यमविषयक कोणत्याही एका विषयावर शोधनिबंधाचे सादरीकरण करणे.

मूलभूत वाचन :

१. जोशी, सुधा — *कथा संकल्पना आणि समीक्षा, मौज प्रकाशन, मुंबई, २००२*

२. सारंग, विलास — *सर्जनशोध आणि लिहिता लेखक, मौज प्रकाशन, मुंबई*

३. मालशे, मिलिंद (संपा.) — *शोधनिबंधाची लेखनपद्धती (सुधारित आवृत्ती) लोकवाङ्मय गृह, मुंबई*

४. पाटील, आनंद — *सृजनात्मक लेखन, पद्मगंधा प्रकाशन, पुणे, २००९*

५. काळे, कल्याण, पुंडे, द. दि. — *व्यावहारिक मराठी, निराली प्रकाशन, पुणे, २००७*

६. वेलणकर, जयंत — *प्रबंध कसा लिहावा, साहित्य प्रसारक केंद्र, नागपूर*

७. कऱ्हाडे, सदा — *संशोधन : सिद्धांत आणि पद्धती, लोकवाङ्मय गृह, मुंबई*

८. चुनेकर, सु. रा. व
   पठारे, रंगनाथ (संपा.) — *संशोधन स्वरूप आणि पद्धती, शि. प्र. संस्था, संगमनेर*

९. वरखेडे, रमेश नारायण व
   वरखेडे, मंगला रमेश — *संशोधनाचे पद्धतिशास्त्र, ऊँग्रामण्ये इन्स्टिट्यूट ऑफ एज्युकेशन, एक्सलन्स, पुणे*

१०.रोकडे, सुहास — *संगणक व माहिती तंत्रज्ञान, नाथे प्रकाशन, पुणे*

पूरक वाचन :

१. नसिराबादकर, ल. रा. — *व्यावहारिक मराठी, फडके प्रकाशन, कोल्हापूर*

२. रेगे, मे. पुं. (संपा.) — *नवभारत (मासिक), व्यावहारिक मराठी विशेषांक, प्राज्ञ पाठशाळा मंडळ, वाई, ऑगस्ट–सप्टेंबर, १९८१*

३. गवस, राजन; शिंदे, अरुण व
   पाटील, गोमटेश्वर — *भाषिक सर्जन आणि उपयोजन, दर्या प्रकाशन, पुणे, २०१२*

४. गोविलकर, लीला
   पाटणकर, जयश्री — *व्यावहारिक मराठी, स्नेहवर्धन पब्लिशिंग हाऊस, पुणे, २००७*

५. शेख, यास्मिन — *मराठी लेखन मार्गदर्शिका, राज्य मराठी विकास संस्था व शुभदा सारस्वत प्रकाशन, पुणे, १९९९/सुधारित तिसरी आवृत्ती, राज्य मराठी विकास संस्था, मुंबई, डिसें.२०१७*

६. शिकारपूरकर, दीपक — *दिव्यांगमित्र संगणक, उत्कर्ष प्रकाशन, पुणे*

७. शेख, यास्मिन — मराठी हस्तलेखन कोश, दुसरी आवृत्ती, हर्मिस प्रकाशन, पुणे, २०१५

संदर्भ ग्रंथ :

१. तौर, पृथ्वीराज — *मराठी भाषिक कौशल्ये विकास, अथर्व पब्लिकेशन्स, धुळे, २०१८*

२. जोशी, प्रभाकर व
   वले, वासुदेव — *उपयोजित मराठी भाग १, प्रशांत पब्लिकेशन्स, जळगाव, २०१७*

३. सारंग, विलास — *सर्जनशोध आणि लिहिता लेखक, मौज प्रकाशन, मुंबई*

४. पाटील, आनंद — *सृजनात्मक लेखन, पद्मगंधा प्रकाशन, पुणे*

५. लोखंडे, शशिकांत — *नवी जाणीव, लोकवाङ्मय गृह, मुंबई, २०१२*

६. गवळी, अनिल — *मराठी भाषा : आज आणि उद्या, दर्या प्रकाशन, पुणे, २०१८*

७. गवळी, अनिल व मोरे, नंदकुमार — *भाषासंवाद, सायन पब्लिकेशन, पुणे, २०१३*

८. कांबळे, विनोद — *सर्जननोंदी, वाचनकट्टा प्रकाशन, प्रा. लि., कोल्हापूर, २०१९*

९. वरखेडे, मंगला — प्रकल्प अभ्यास, नाशिक

वाङ्मय प्रवाहाचे अध्ययन : मध्ययुगीन

पाठ्यपुस्तक : दृष्टांतपाठ-निवडक दृष्टांत (संपादन)

शिवाजी विद्यापीठ प्रकाशन, कोल्हापूर

उद्दिष्टे :

१. मध्ययुगीन महाराष्ट्र व महानुभाव पंथ यांचा परिचय करून घेणे.

२. महानुभाव वाङ्मयाच्या प्रेरणा व स्वरूप समजून घेणे.

३. महानुभावीय ग्रंथकार केसोबास यांचा परिचय करून घेणे.

४. दृष्टांतपाठातील आशयस्वरूप व अभिव्यक्ती विशेष अभ्यासणे.

५. दृष्टांतपाठातील भाषिक वैभवाचा परिचय करून घेणे.

अभ्यासक्रम

अ. क्र. Sr. No.	घटक Topic	अध्यापन तासिका Teaching Hours	श्रेयांक Credit
विभाग १ Module I	● मध्ययुगीन महाराष्ट्र आणि महानुभावीय गद्याच्या प्रेरणा व स्वरूप ● महानुभाव गद्य ग्रंथकार केसोबास यांचा परिचय ● दृष्टांतपाठाचे स्वरूप	१५	१
विभाग २ Module II	■ दृष्टांतपाठातील आशयसूत्रे ● सामाजिकता ● सांस्कृतिकता ● प्रादेशिकता ● पंथीय निष्ठा ● तत्त्वज्ञान व मूल्यविचार	१५	१
विभाग ३ Module III	■ दृष्टांतपाठातील अभिव्यक्ती विशेष ● निवेदन/कथनशैली ● व्यक्तिचित्रणे ● घटना, प्रसंगवर्णने ● प्रतिमा व प्रतीके ● रचनाविशेष	१५	१
विभाग ४ Module IV	■ दृष्टांतपाठातील भाषावैभव ● शब्दसौष्ठव ● अल्पाक्षरत्व ● सुलभ रचनाविशेष ● म्हणी,वाक्प्रचार,उखाणे ● अलंकार वैभव ● व्याकरणिक विशेष	१५	१

Pattern of Question Paper

एकूण गुण – ४० : Total Marks-40

प्रश्न १	योग्य पर्याय निवडा	०५ गुण
प्रश्न २	अंतर्गत विकल्पासह दीर्घोत्तरी प्रश्न	१५ गुण
प्रश्न ३	अंतर्गत विकल्पासह लघूत्तरी प्रश्न (तीन पैकी दोन)	१० गुण
प्रश्न ४	टिपा लिहा (चार पैकी दोन)	१० गुण

सूचना : १. विभाग एकवर वस्तुनिष्ठ प्रश्न असणार नाहीत.

२. अंतर्गत मूल्यमापनाकरिता सेमिनारसाठी दहा गुण आहेत.

सेमिनार विषय :

मध्ययुगीन मराठी वाङ्मयातील कोणत्याही एका साहित्यकृतिआधारे सामाजिक, सांस्कृतिक, मूल्यविचार, भाषाविशेष इत्यादींपैकी कोणत्याही एका विषयानुषंगाने सादरीकरण करणे.

मूलभूत वाचन :

१. तुळपुळे, शं. गो. (संपा.) *दृष्टांतपाठ, केशिराज संकलित, व्हीनस प्रकाशन, पुणे*

२. कोलते, वि. भि. *महानुभाव तत्त्वज्ञान, अरुण प्रकाशन, मलकापूर*

३. कोलते, वि. भि. *महानुभाव आचारधर्म, अरुण प्रकाशन, मलकापूर*

४. राजनकर, सुहास *दृष्टांतपाठ : अन्वय आणि चिकित्सा, ऋचा प्रकाशन, नागपूर*

५. कुंदप, कोमल कन्हैया *चक्रधर निरुपन दृष्टांतपाठ विवेचन, सातारा*

पूरक वाचन :

१. पठाण, यू. म. *महानुभाव साहित्य संशोधन खंड १, मराठवाडा विद्यापीठ प्रकाशन, औरंगाबाद*

२. पंजाबी, माधव (संपा.) *श्री. च. पाणी व्यासकृत दृष्टांत अन्वय व्याख्यान*

३. आवलगावकर, रमेश *महानुभावांची अन्वयस्थळे, चंद्रकांत प्रकाशन, पुणे*

४. ढेरे, रा. चिं. *प्राचीन मराठीच्या नवधारा, मोघे प्रकाशन, कोल्हापूर*

संदर्भ ग्रंथ :

१. पानसे, मु. ग. *यादवकालीन महाराष्ट्र, मुंबई मराठी ग्रंथ संग्रहालय, मुंबई*

२. बोरगांवकर, वसंत *प्राचीन मराठी चरित्रलेखन, कॉन्टिनेन्टल प्रकाशन, पुणे*

३. तुळपुळे, शं. गो. *यादवकालीन मराठी भाषा, व्हीनस प्रकाशन, पुणे*

४. देशमुख, उषा *मराठी साहित्याचे आदिबंध, लोकवाङ्मयगृह, मुंबई*

५. ढेरे, रा. चिं. *महाराष्ट्राचा देव्हारा, विश्वकर्मा साहित्यालय, पुणे*

६. पाठक, अरुणचंद्र *स्थानपोथी : एक पुरातत्वीय अभ्यास, म.रा.साहित्य संस्कृती मंडळ, मुंबई*

शिवाजी विद्यापीठ, कोल्हापूर
SHIVAJI UNIVERSITY, KOLHAPUR

मराठी अभ्यास मंडळ

Board of Studies in Marathi

पसंतीवर आधारित श्रेयांक पद्धती

Choice Based Credit System

बी.ए. भाग-३ : B.A. Part-III

अभ्यासक्रम : Syllabus

June, 2020 onward

सत्र-६ : Semister No. 6 : अभ्यासपत्रिका क्र. XII

Discipline Specific Elective (DSE-E126)

विद्याशाखीय विशेष निवड (DSE-E126)

साहित्यविचार

उद्दिष्टे :

१. शब्दशक्तींचे आकलन करून घेणे.

२. साहित्यातील रसाचे स्वरूप व रसप्रक्रिया समजून घेणे.

३. निर्मितीच्या आनंदाची मीमांसा करणे.

४. व्यवहार भाषा, शास्त्रभाषा आणि साहित्यभाषा यांतील भेद समजून घेणे.

५. साहित्यभाषेचे आकलन करून घेणे.

६. भाषेतील छंद व वृत्ते यांचा अभ्यास करणे.

अभ्यासक्रम

अ. क्र. Sr. No.	घटक Topic	अध्यापन तासिका Teaching Hours	श्रेयांक Credit
विभाग १ Module I	**शब्दशक्ती** ■ शब्दशक्ती म्हणजे काय ? १) **अभिधा**–व्याखा, स्वरूप व प्रकार (योग, रूढी, योगरूढी) २) **लक्षणा** – व्याख्या, स्वरूप ● लक्षणेस आवश्यक गोष्टी अ) मुख्यार्थबाध ब) मुख्यार्थ–लक्ष्यार्थ संबंध क) रूढी व प्रयोजन ● लक्षणेचे महत्त्व ३) **व्यंजना** – व्याख्या, स्वरूप ● व्यंजनेचे मुख्य दोन प्रकार अ) शाब्दी व्यंजना ब) आर्थी व्यंजना ● व्यंजनेचे साहित्यातील महत्त्व	१५	१

विभाग २ Module 2	**अ) रसविचार** ● रस म्हणजे काय ? ● स्थायिभाव व रस ● भरताचे रससूत्र **ब) काव्यानंदमीमांसा** ● काव्यानंदमीमांसा म्हणजे काय ? ● कवीचा आनंद १) क्रीडानंद २) निर्मितीचा आनंद ३) आत्माविष्कारानंद ● रसिकाचा आनंद १) ज्ञानानंद २) जिज्ञासापूर्ती ३) पुनःप्रत्ययाचा आनंद ● करुणरसानंद १) केवलानंदवाद २) विरेचन (कॅथार्सिस)	१५	१
घटक ३ Module 3	**साहित्याची भाषा** १) व्यवहारभाषा, शास्त्रभाषा व साहित्यभाषा : साम्यभेद २) साहित्याचे माध्यम भाषा ३) साहित्य भाषेचे सौंदर्य ४) साहित्य भाषेची विविधता	१५	१
घटक ४ Module IV	**छंद व वृत्ते** अ) छंद – १) ओवी २) अभंग ३) मुक्तच्छंद ब) वृत्ते – १) भुजंगप्रयात २) वसंततिलका ३) दिंडी (व्याख्या, स्वरूप व उदाहरणे अपेक्षित)	१५	१

❋ प्रश्नपत्रिकेचे स्वरूप व गुणविभागणी ❋

Pattern of Question Paper

एकूण गुण – ४० : Total Marks-40

प्रश्न १	योग्य पर्याय निवडा	०५ गुण
प्रश्न २	अंतर्गत विकल्पासह दीर्घोत्तरी प्रश्न	१५ गुण
प्रश्न ३	अंतर्गत विकल्पासह लघूत्तरी प्रश्न (तीन पैकी दोन)	१० गुण
प्रश्न ४	छंद व वृत्ते (चार पैकी दोन)	१० गुण

सूचना :

१. विभाग चार वर वस्तुनिष्ठ प्रश्न असणार नाहीत.

२. गटप्रकल्पासाठी अंतर्गत मूल्यमापनाकरिता प्रती विद्यार्थ्यास दहा गुण आहेत.

गटप्रकल्प विषय : साहित्यनिर्मितिप्रक्रिया संदर्भात कोणत्याही एका साहित्यिकाची मुलाखत घेणे.

मूलभूत वाचन :

१. जोग, रा. श्री.   *अभिनव काव्यप्रकाश*, व्हीनस प्रकाशन, पुणे, आवृत्ती ७ वी, जानेवारी, १९७५

२. गाडगीळ, स. रा.   *काव्यशास्त्रप्रदीप*, व्हीनस प्रकाशन, पुणे, आवृत्ती ४ थी, जानेवारी, १९९३

३. वाटवे, के. ना.   *रसविमर्श*, नवीन किताबखाना, पुणे, १९४२

४. वाळंबे, मो. रा.   *सुगम मराठी व्याकरण लेखन*, नितीन प्रकाशन, पुणे

५. नेमाडे, भालचंद्र   *साहित्याची भाषा*, साकेत प्रकाशन, औरंगाबाद, आ. दु. १९९८

पूरक वाचन :

१. जोशी, पं. महादेवशास्त्री   *सुलभ काव्याशास्त्र*, एस. जगन्नाथ आणि कं., पुणे

२. उपासे, शिवशंकर   *काव्यशास्त्र परिचय*, फडके प्रकाशन, कोल्हापूर, २०१३

३. जाधव, उदय   *काव्यशास्त्र : आकलन आणि आस्वाद*, लोकपाल पब्लिकेशन, औरंगाबाद, प्रथमावृत्ती, ५ सप्टेंबर २०१३

४. शिरवाडकर, के. रं.   *साहित्यवेध*, मेहता पब्लिशिंग हाऊस, पुणे, प्रथमावृत्ती, जानेवारी, १९९८

संदर्भ ग्रंथ :

१. कुरुंदकर, नरहर   *रससूत्र*, इंद्रायणी साहित्य, पुणे.

२. सोनार, ब. लु.   *भारतीय साहित्य विचार*, प्रज्ञा, अमळनेर, १९८८

३. मोरे, मोरेश्वर सखाराम   *मराठी व्याकरण*, चित्रशाळा, पुणे, १९७०

४. वासमकर, वि. दा.   *मराठीतील कलावादी समीक्षा*, अक्षरदीप प्रकाशन, कोल्हापूर, आ. प. २०१८

५. तुकदेव, रोहिणी   *ओवी छंद : रूप आणि आविष्कार*, प्रतिमा प्रकाशन, पुणे

६. हिरेमठ, राजशेखर   *मराठी व्याकरण परिचय*, मेहता पब्लिशिंग हाऊस, पुणे, १९८८

७. जाधव, मा. मा.   *अक्षरगाथा (मराठी साहित्यविचार विशेषांक)*, मासिक, नांदडे, एप्रिल, २०१४

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SHIVAJI UNIVERSITY, KOLHAPUR
मराठी अभ्यास मंडळ
Board of Studies in Marathi
पसंतीवर आधारित श्रेयांक पद्धती
Choice Based Credit System
बी.ए. भाग-३ : B.A. Part-III
अभ्यासक्रम : Syllabus
June, 2020 onward
सत्र-६ : Semister No. 6 : अभ्यासपत्रिका क्र. XIII
Discipline Specific Elective (DSE-E127)
विद्याशाखीय विशेष निवड (DSE-E127)
मराठी भाषा व भाषाविज्ञान

उद्दिष्टे :

१. मराठी भाषेची वर्णव्यवस्था समजून घेणे.

२. ध्वनी व अर्थपरिवर्तनाची कारणे व प्रकार यांची माहिती करून घेणे.

३. प्रमाणभाषेचे स्वरूप व विशेष अभ्यासणे.

४. बोलींचे स्वरूप व विशेष समजून घेणे.

५. मराठी भाषेबद्दलची विद्यार्थ्यांची आवड विकसित करणे.

अभ्यासक्रम

अ. क्र. Sr. No.	घटक Topic	अध्यापन तासिका Teaching Hours	श्रेयांक Credit
विभाग १ Module I	मराठीची वर्णमाला ● ध्वनी व वर्ण, मराठीची वर्णमाला, पारंपरिक स्वर व त्यांचे वर्गीकरण ● स्वरांचे ध्वनिशास्त्रदृष्टच्या व उच्चारण स्थानानुसार विश्लेषण ● स्वरांचे प्रकार हस्व, दीर्घ, सिद्ध, साधित, सजातीय, विजातीय ● मराठीची स्वर संख्या (पारंपरिक व नवीन) ● मराठीतील व्यंजन विचार ● व्यंजनांचे प्रकार १. स्पर्श व्यंजने २. कठोर व मृदू व्यंजने ३. अल्पप्राण व महाप्राण ४. अनुनासिके ५. तालव्य व्यंजने ६. अंतःस्थ व्यंजने ७. उष्म व्यंजने ८. संयुक्त व्यंजने ९. मूर्धन्य ● मराठीची व्यंजन संख्या (पारंपरिक व नवीन) ● मराठीची वर्ण संख्या निश्चितीकरण	१५	१

विभाग २
Module II
	मराठीचे ध्वनिपरिवर्तन
	● भाषेची उच्चारप्रक्रिया
	● ध्वनिपरिवर्तन म्हणजे काय?
	● व्याख्या आणि विशेष
	   निरपवाद, नियमित, अज्ञेय, सार्वत्रिक ध्वनिपरिवर्तन
	● कारणे
	   जित – जेते संबंध, भिन्न भाषिक संबंध, आळस, अनुकरणाची अपूर्णता, वागेंद्रियातील दोष, श्रवणेंद्रियातील दोष, उच्चारशीघ्रता, अज्ञान, आघात, उच्चारसौकर्य, आहार, भौगोलिकता, वर्गसिद्धान्त, लोकभ्रम, सादृश्यता
	● प्रकार
	   अंत्यस्वनलोप, एकस्वनीकरण, आद्यस्वनागम, मध्यस्वनागम, अंत्यस्वनागम, सान्निध परिणाम, समानस्वनलोप, विसदृशीकरण, घोषीकरण, अघोषीकरण, मात्राभेद, सदृशता, अतिशुद्धी, दुष्प्रयोग, स्वनविपर्यय
	● ध्वनिपरिवर्तनाचा मराठी भाषेवरील परिणाम
		१५	१

विभाग ३
Module III
	मराठीचे अर्थपरिवर्तन
	● अर्थपरिवर्तन म्हणजे काय ?
	● व्याख्या आणि स्वरूप
	   अर्थ म्हणजे निर्देश, प्रतिमा, संकल्पना व विचार
	● अर्थपरिवर्तनाची कारणे
	   साम्यतत्त्व, रूपक – लक्षणाजन्य शब्द, बदलते समाजजीवन, अशुभतापरिहार, ग्राम्यतापरिहार, अतिशयोक्ती, शब्दसिद्धी, अतिपरिचयातून सभ्यता, अत्यादरदर्शन, सांस्कृतिक आदान
	● अर्थपरिवर्तनाचे प्रकार –
	   अर्थविस्तार, अर्थसंकोच, अर्थप्रशस्ती, अर्थच्युती, अर्थापकर्ष, अर्थान्तर, अर्थभ्रंश, अर्थादेश, अर्थभेद, अर्थसार
	● अर्थपरिवर्तनाचा मराठी भाषेवरील परिणाम
		१५	१

विभाग ४ **Module IV**	प्रमाण मराठी भाषा आणि तिच्या बोली ● प्रमाण मराठी : संकल्पना, स्वरूप, विशेष ● बोली : संकल्पना, स्वरूप, विशेष ● मराठीच्या बोली : अहिराणी, वऱ्हाडी, चंदगडी, मालवणी या निवडक बोलींचे स्वरूप व विशेष	१५	१

एकूण गुण – ४० : Total Marks-40

प्रश्न १	योग्य पर्याय निवडा	०५ गुण
प्रश्न २	अंतर्गत विकल्पासह दीर्घोत्तरी प्रश्न	१५ गुण
प्रश्न ३	अंतर्गत विकल्पासह लघूत्तरी प्रश्न (तीन पैकी दोन)	१० गुण
प्रश्न ४	टिपा लिहा (चार पैकी दोन)	१० गुण

सूचना : १. विभाग एकवर वस्तुनिष्ठ प्रश्न असणार नाही.

२. अंतर्गत मूल्यमापनाकरिता सेमिनारसाठी दहा गुण आहेत.

गटप्रकल्प विषय :

१. आपल्या परिसरातील कौटुंबिक, सांस्कृतिक, कृषिविषयक, औद्योगिक क्षेत्रात जी बोलीभाषा बोलली जाते त्या बोलीभाषेतील शब्द, वाक्य, वाक्प्रचार, म्हणी, उखाणे यांचे संकलन आणि विश्लेषणासह गटप्रकल्प अपेक्षित.

२. आपल्या परिसरातील लोककथा, लोकगीते यांचे संकलन करून त्यातील भाषिक विशेषांच्या विश्लेषणावर आधारित गटप्रकल्प अपेक्षित.

मूलभूत वाचन :

१. कुलकर्णी, कृ. पां.	मराठी भाषा : उद्गम आणि विकास, मेहता पब्लिशिंग हाऊस, पुणे
२. कानडे, मु. श्री. (संपा.)	मराठीचा भाषिक अभ्यास, स्नेहवर्धन प्रकाशन, पुणे
३. गजेंद्रगडकर श्री. न.	भाषा आणि भाषाशास्त्र, व्हीनस प्रकाशन, पुणे
४. कुलकर्णी कृ. पां.	शब्द : उद्गम आणि विकास
५. जोगळेकर गं. ना.	अभिनव भाषाविज्ञान, सुविचार प्रकाशन, पुणे
६. जोशी, प्र. न.	सुबोध भाषाशास्त्र, स्नेहवर्धन प्रकाशन, पुणे
७. दामले, मो. के.	शास्त्रीय मराठी व्याकरण, दामोदर सावळाराम आणि मंडळी, पुणे
८. कालेलकर, ना. गो.	ध्वनिविचार, मौज प्रकाशन, मुंबई
९. पोतदार, अनुराधा	मराठीचा अर्थविचार, पुणे विद्यापीठ प्रकाशन, पुणे
१०. कालेलकर, ना. गो.	भाषा आणि संस्कृती, मौज प्रकाशनगृह, मुंबई
११. देवी, गणेश व जाखडे, अरुण (संपा.)	भारतीय भाषेचे लोकसर्वेक्षण, पद्मगंधा प्रकाशन, पुणे

पूरक वाचन :

१. हिरेमठ, राजशेखर	मराठी व्याकरण परिचय, मेहता पब्लिशिंग हाऊस, पुणे
२. गवळी, अनिल	भाषाविज्ञान आणि मराठी भाषा, हिरण्यकेशी प्रकाशन, कोल्हापूर
३. कुलकर्णी, सुलक्षणा व कुबेर, वसंत	भाषाविज्ञान परिचय, फडके प्रकाशन, कोल्हापूर

संदर्भ ग्रंथ :

१. पुंडे, द. दि.	सुलभ भाषाविज्ञान, स्नेहवर्धन प्रकाशन, पुणे
२. कदम, महेंद्र	मराठीचे वर्णनात्मक भाषाविज्ञान, स्नेहवर्धन प्रकाशन, पुणे
३. कालेलकर, ना. गो.	भाषा, इतिहास आणि भूगोल, मौज मुंबई
४. शेख, यास्मिन	मराठी लेखन मार्गदर्शिका, राज्य मराठी विकास संस्था, मुंबई
५. हिरेमठ, राजशेखर	मराठी व्याकरण परिचय, मेहता पब्लिशिंग हाऊस, पुणे
६. लामतुरे, प्रज्ञा	ग्रामीण बोलीभाषेचे वैभव, संस्कृती प्रकाशन, पुणे
७. जंबाले, विठ्ठल	ग्रामीण कादंबरी : मराठवाडी बोलीचे स्वरूप, चिन्मय प्रकाशन, औरंगाबाद
८. पाटील, व्ही. एन.	सुलभ भाषाविज्ञान, प्रशांत पब्लिकेशन्स, जळगाव, २०१६
९. भांड, बाबा व मगर, राजेंद्र	भाषा आणि साहित्य : माझी भूमिका : सयाजीराव गायकवाड, महाराजा सयाजीराव गायकवाड संशोधन व प्रशिक्षण संस्था, औरंगाबाद
१०. केळकर, तन्मय (अनु.)	पंजाबच्या भाषा आणि लिपीची समस्या : शहीद भगतसिंग, प्रका. भाषाविकास संशोधन संस्था, कोल्हापूर

शिवाजी विद्यापीठ, कोल्हापूर
SHIVAJI UNIVERSITY, KOLHAPUR
मराठी अभ्यास मंडळ

Board of Studies in Marathi

पसंतीवर आधारित श्रेयांक पद्धती

Choice Based Credit System

बी.ए. भाग-३ : B.A. Part-III

अभ्यासक्रम : Syllabus

June, 2020 onward

सत्र-६ : Semister No. 6 : अभ्यासपत्रिका क्र. XIV

Discipline Specific Elective (DSE-E128)

विद्याशाखीय विशेष निवड (DSE-E128)

मध्ययुगीन मराठी वाङ्मयाचा इतिहास (इ.स.१५०० ते इ.स.१८००)

उद्दिष्टे :

१. मध्ययुगीन मराठी वाङ्मयाचा कालिक अभ्यास करणे.

२. मध्ययुगीन मराठी वाङ्मयाचा स्थूल परिचय करून घेणे.

३. पंडित कवी व त्यांची रचना यांचा परिचय करून घेणे.

४. बखर वाङ्मय आणि शाहिरी वाङ्मय यांचे स्वरूप, विशेष अभ्यासणे.

५. मध्ययुगीन मराठी गद्य, पद्य रचनेचे विशेष अभ्यासणे.

अभ्यासक्रम

अ. क्र. Sr. No.	घटक Topic	अध्यापन तासिका Teaching Hours	श्रेयांक Credit
विभाग १ Module I	इ. स. १५०० ते इ.स. १६०० एकनाथांची साहित्य संपदा चतु:श्लोकी भागवत, एकनाथी भागवत, भावार्थ रामायण, गवळणी, भारुडे इत्यादी रचना	१५	१
विभाग २ Module II	इ. स. १६०० ते इ. स. १७०० (स्थूल कालखंड) अ) तुकारामांची अभंगरचना ब) रामदासांची ग्रंथरचना करुणाष्टके, रामायणे, मनाचे श्लोक, दासबोध, स्फुट प्रकरणे	१५	१
विभाग ३ Module III	इ. स. १६०० ते इ. स. १८०० (स्थूल कालखंड) निवडक पंडित कवींच्या काव्याचा अभ्यास १) मुक्तेश्वर २) वामन पंडित ३) रघुनाथ पंडित ४) श्रीधर ५) मोरोपंत	१५	१
विभाग ४ Module IV	इ. स. १५०० ते इ.स. १८०० (स्थूल कालखंड) अ) बखर वाङ्मय शिवपूर्वकालीन बखरी, शिवकालीन बखरी, पेशवेकालीन बखरी–स्वरूप, विशेष ब) शाहिरी वाङ्मय (लावणी व पोवाडा) १) अनंत फंदी २) परशराम ३) राम जोशी ४) प्रभाकर ५) होनाजी बाळा	१५	१

Pattern of Question Paper

एकूण गुण – ४० : Total Marks-40

प्रश्न १	योग्य पर्याय निवडा	०५ गुण
प्रश्न २	अंतर्गत विकल्पासह दीर्घोत्तरी प्रश्न	१५ गुण
प्रश्न ३	अंतर्गत विकल्पासह लघूत्तरी प्रश्न (तीन पैकी दोन)	१० गुण
प्रश्न ४	टिपा लिहा (चार पैकी दोन)	१० गुण

सूचना :   १. गटप्रकल्पासाठी अंतर्गत मूल्यमापनाकरिता प्रती विद्यार्थ्यास दहा गुण आहेत.

गटप्रकल्प विषय :

❋ आपल्या परिसरातील कोणत्याही ग्रंथालयातील किंवा ग्रंथालयाबाहेरील मध्ययुगीन मराठी ग्रंथकार आणि ग्रंथ यांची सूची तयार करावी.

❋ मध्ययुगीन मराठी वाङ्मयातील निवडक शब्दांचा शब्दसंग्रह करणे आणि त्यांचे वर्गीकरण व विश्लेषण करणे.

मूलभूत वाचन :

१. नसिराबादकर, ल. रा.   *प्राचीन मराठी वाङ्मयाचा इतिहास, फडके प्रकाशन, कोल्हापूर*

२. देशपांडे, अ. ना.   *प्राचीन मराठी वाङ्मयाचा इतिहास खंड १ ते ४, व्हीनस प्रकाशन, पुणे*

३. पांगारकर, ल. रा.   *प्राचीन मराठी वाङ्मयाचा इतिहास खंड १ ते ३,महाराष्ट्र साहित्य परिषद,पुणे*

४. मंचरकर, र. बा.   *धर्म संप्रदाय आणि मध्ययुगीन मराठी वाङ्मय, प्रतिमा प्रकाशन, पुणे*

५. गवळी, अनिल   *सर्वात्मभावी तुकाराम, सायन पब्लिकेशन प्रा. लि. पुणे*

६. सपकाळे, प्रकाश   *संत तुकाराम, प्रशांत पब्लिकेशन्स, जळगाव*

७. वाटवे, के. ना. (संपा.)   *प्राचीन मराठी पंडिती काव्य.*

८. फाटक, न. र.   *श्री एकनाथ वाङ्मय दर्शन आणि कार्य, मौज प्रकाशन गृह, मुंबई*

९. सरदेशमुख, त्र्यं. वि.   *रामदास : प्रतिमा आणि बोध, अस्मिता प्रकाशन, पुणे*

१०. हेरवाडकर, र. वि.   *मराठी बखर, व्हीनस प्रकाशन, पुणे*

११. अदवंत, म. ना.   *पैंजण, साहित्य प्रसार केंद्र, नागपूर*

१२. सहस्रबुद्धे, म. ना.   *मराठी शाहिरी वाङ्मय, ठोकळ प्रकाशन, पुणे*

१३. खरात, महेश (संपा.)   *लोकसाहित्य : जीवन आणि संस्कृती,(प्रा.विश्वनाथ शिंदे गौरवग्रंथ), सायन पब्लिकेशन, पुणे*

पूरक वाचन :

१. तुलपुळे, शं. गो. (संपा.)   *मध्ययुगीन मराठी वाङ्मयाचा इतिहास, म. सा. प., पुणे*

२. तुलपुळे , शं. गो. (संपा.)   *मराठी वाङ्मयाचा इतिहास, महाराष्ट्र साहित्य परिषद, पुणे*

३. उपासे, शिवशंकर   *मराठी काव्यातील शिवदैवत दर्शन, आख्यानकाव्य व स्फुटकाव्य : १३ ते १८ वे शतक, शैवभारती शोध प्रतिष्ठान, जंगमवाडी मठ, वाराणसी*

४. पाटील, तानाजी   *संत साहित्यातील सामाजिकता, विश्वकर्मा प्रकाशन, पुणे*

५. हेरवाडकर, र. वि.   *मराठी बखर*

संदर्भ ग्रंथ :

१. बडवे, सतीश   *मध्ययुगीन साहित्याविषयी, मीरा, औरंगाबाद*

२. फाटक, न. र.   *श्री. रामदास, वाङ्मय आणि कार्य*

३. माटे, श्री. म.   *संत, पंत आणि तंत, ठोकळ प्रकाशन, पुणे*

४. होनमाने, धनंजय   *तंजावरची मराठी कीर्तनपरंपरा, स्नेहवर्धन, पुणे*

५. होनमाने, धनंजय   *पंत प्रतिनिधींची कीर्तनाख्याने, दर्या प्रकाशन, पुणे*

६. ग्रामोपाध्ये, गं. ब.   *मराठी बखर गद्य, व्हीनस बुक स्टॉल, पुणे*

७. शिंदे, विश्वनाथ   *शाहिरी वाङ्मयाच्या धारा, प्रतिमा प्रकाशन, पुणे*

७. केळकर, य. न.   *मराठी शाहीर आणि शाहिरी वाङ्मय, पुणे विद्यापीठ, पुणे*

९. मोरजे, गंगाधर   *म-हाटी लावणी वाङ्मय, मोघे प्रकाशन, कोल्हापूर*

१०. वर्दे, श्री. म.   *मराठी कवितेचा उषःकाल किंवा मराठी शाहीर,मुंबई मराठी साहित्य संघ,मुंबई*

उद्दिष्टे :

१. प्रसारमाध्यमांतील अर्थार्जनाच्या संधी आणि भाषिक कौशल्ये यांचा परिचय करून घेणे.

२. स्पर्धा परीक्षांमध्ये मराठी भाषा विषयाचे महत्त्व समजून घेणे.

३. उद्योग व सेवा क्षेत्रात मराठी भाषेद्वारे अर्थार्जनप्राप्ती संदर्भात ज्ञान संपादन करणे.

४. मुद्रित शोधनाची पद्धत अभ्यासणे.

अभ्यासक्रम

अ. क्र. Sr. No.	घटक Topic	अध्यापन तासिका Teaching Hours	श्रेयांक Credit
विभाग १ Module I	प्रसारमाध्यमांतील अर्थार्जनाच्या संधी व भाषिक कौशल्ये ■ मुद्रित माध्यमे (Print Media) 　　१. संपादन २. स्तंभलेखन ३. जाहिरात लेखन 　　४. शब्दांकन (नावीण्यपूर्ण उपक्रम, व्यक्तींचे अनुभव व मानपत्र) ■ आकाशवाणी 　　१. निवेदन २. संहिता लेखन (कृषी, महिला व शैक्षणिक विषयक) 　　३. बातमी लेखन ■ चित्रवाणी 　　१. निवेदन २. संहिता लेखन (साहित्य, युवा व मनोरंजन विषयक) 　　३. बातमी लेखन	१५	१

विभाग २ Module II	उद्योग व सेवाक्षेत्रातील अर्थार्जनाच्या संधी व भाषिक कौशल्ये ■ उद्योग व सेवाक्षेत्र आणि मराठी भाषा ■ उद्योग व सेवाक्षेत्रातील अर्थार्जन संधी – १. विपणन (Marketing) साठी संवाद कौशल्ये २. ग्राहक सेवा केंद्र (Call Centers) ३. अनुवाद ४. मराठी टंकलेखन, युनिकोड व पीपीटी (Power Point Presentation) परिचय	१५	१
विभाग ३ Module III	मुद्रितशोधन १. मुद्रितशोधन : संकल्पना, स्वरूप, प्रकार व महत्त्व २. महाराष्ट्र शासनाचे प्रमाणलेखनविषयक १८ नियम, अपवाद, उदाहरणे, विरामचिन्हे ३. मुद्रित शोधनाची पद्धत : सांकेतिक खुणा, त्याचे स्पष्टीकरण, पहिले वाचन व पुढील मुद्रितशोधन, संगणकीय मुद्रितशोधन ४. मुद्रितशोधनाचे प्रात्यक्षिक कार्य :वर्तमानपत्र, नियतकालिक, ग्रंथ, छापील मजकूर, लेख इ.	१५	१
विभाग ४ Module IV	स्पर्धा परीक्षांसाठी मराठी १. स्पर्धा परीक्षांचे स्वरूप : सरळसेवा, कम्बाईन, राज्यसेवा, संघ लोकसेवा आयोग २. स्पर्धा परीक्षांमधील मराठीचे स्वरूप : अभ्यासक्रम परिचय ३. स्पर्धा परीक्षेसाठी कौशल्ये : वाचन, नोट्स (टिपणे), लेखन, हस्ताक्षर, वेळेचे व्यवस्थापन, गटचर्चा,संदर्भ साहित्य ४. मुलाखतीची पूर्वतयारी व तंत्रे (मुलाखत कशी द्यावी)	१५	१

❈ प्रश्नपत्रिकेचे स्वरूप व गुणविभागणी ❈

Pattern of Question Paper

एकूण गुण – ४० : Total Marks-40

प्रश्न १	योग्य पर्याय निवडा	०५ गुण
प्रश्न २	अंतर्गत विकल्पासह दीर्घोत्तरी प्रश्न	१५ गुण
प्रश्न ३	अंतर्गत विकल्पासह लघूत्तरी प्रश्न (तीन पैकी दोन)	१० गुण
प्रश्न ४	टिपा लिहा (चार पैकी दोन)	१० गुण

सूचना : १. गटप्रकल्पासाठी अंतर्गत मूल्यमापनाकरिता प्रती विद्यार्थ्यास दहा गुण आहेत.

गटप्रकल्प विषय :

१. राष्ट्रीय, शैक्षणिक, सांस्कृतिक, सामाजिक, कृषी, आरोग्य, भाषा व साहित्य क्षेत्रातील ताज्या घडामोडी यापैकी एका विषयावर आकाशवाणी किंवा चित्रवाणीसाठी संहितालेखन.

२. उद्योग व सेवाक्षेत्रे आणि प्रसारमाध्यमे यांना भेटी देऊन तेथील भाषिक उपयोजनावर आधारित प्रकल्प तयार करणे.

मूलभूत वाचन :

१. काणे, पुष्पा	*नभोवाणी कार्यक्रम : तंत्र आणि मंत्र*, इंडिया बुक कंपनी, पुणे
२. भागवत, यशोदा	*बोलका कॅमेरा*, मौज प्रकाशन, पुणे
३. राजाध्यक्ष, विजया (संपा.)	*मराठी वाङ्मय कोश*, साहित्य आणि संस्कृती मंडळ, मुंबई
४. मोरे, सदानंद व लिंबाळे, शरणकुमार	*प्रबोधनपर वैचारिक वाङ्मय*, य. च. म. मु. विद्यापीठ, नाशिक
५. रेगे, मे. पुं. व इतर	*मराठी विचारवंत आणि आपण*, मौज प्रकाशन गृह, मुंबई
६. शेख, यास्मिन	*मराठी लेखन मार्गदर्शिका*, राज्य मराठी विकास संस्था, मुंबई
७. फडके, अरुण	*मराठी लेखन–कोश*, अंकुर प्रकाशन, ठाणे
८. धायगुडे, य. ए.	*मुद्रितशोधन*, दि पूना प्रेस ओनर्स असो. लि. पुणे
९. खोपकर, अरुण	*चित्रव्यूह*, लोकवाङ्मय गृह, प्रकाशन, मुंबई
१०. वरखेडे, रमेश	*सायबर संस्कृती*, इन्स्टिट्यूट ऑफ नॉलेज इंजिनिअरिंग, नाशिक
११. कांबळे, अमर	*स्पर्धा परीक्षेला सामोरे जाताना*, निर्मिती संवाद प्रकाशन, कोल्हापूर
१२. कांबळे, अमर	*मुलाखत कौशल्य*, निर्मिती संवाद प्रकाशन, कोल्हापूर

पूरक वाचन :

१. कुंभार, प्रकाश	*उपयोजित भाषाविज्ञान आणि प्रसारमाध्यमे*, अक्षरदालन, कोल्हापूर
२. जोशी, प्रभाकर	*उपयोजित मराठी*, प्रशांत पब्लिकेशन्स, जळगाव
३. तौर, पृथ्वीराज	*मराठी भाषिक कौशल्ये विकास*, अथर्व पब्लिकेशन्स, धुळे
४. फडके, अरुण	*शुद्धलेखन मार्गप्रदीप*, अंकुर प्रकाशन, ठाणे
५. दीक्षित, विजय	*चित्रपट : एक कला*, रेणुका प्रकाशन, नाशिक
६. इनामदार, एस. डी.	*माध्यम*, एस. डी. प्रकाशन, पुणे

संदर्भ ग्रंथ :

१. देशपांडे, वि. भा. व जोगळेकर, सुषमा (संपा.)	*मराठी कलाभिरुची*, कॉन्टिनेन्टल प्रकाशन, पुणे
२. पर्चिंद्रे, श्रीराम	*मुलाखत आणि शब्दांकन*, अनुबंध प्रकाशन, पुणे
३. ढोले, विश्राम	*प्रसारमाध्यमे आणि प्रयोगकला*, लोकवाङ्मय गृह, मुंबई
४. शिंदे, अरुण	*सत्यशोधकीय नियतकालिके*, कृष्णा संशोधन व विकास अकादमी, मंगळवेढा
५. जोशी, प्रभाकर व वले, वासुदेव	*उपयोजित मराठी*, प्रशांत पब्लिकेशन्स, जळगाव
६. रेगे, मे. पुं. (संपा.)	*नवभारत (मासिक)*, व्यावहारिक मराठी विशेषांक, प्राज्ञ पाठशाळा मंडळ, वाई (ऑगस्ट–सप्टेंबर १९८१)
७. भालके, रामचंद्र व इतर	*प्रबोधनपर साहित्य : स्वरूप आणि संकल्पना*, य.च.म.मु. विद्यापीठ, नाशिक
८. चपळगावकर, नरेंद्र	*मराठीतील वैचारिक साहित्य : लेखक आणि समाज*, नवभारत, जून २०१६ वर्ष २९, अंक ९
९. चौसाळकर, अशोक	*विचारवंत आणि समाज*, युनिक अॅकॅडमी, पुणे
१०. गावडे, गोपाळ	*मामा वरेरकर : प्रयोगाची नांदी*, मनोकामना प्रकाशन, इस्लामपूर, २०१७
११. कांबळे, विनोद	*सर्जननोंदी*, वाचनकट्टा प्रकाशन, प्रा. लि., कोल्हापूर, २०१९

मराठी अभ्यास मंडळ

Board of Studies in Marathi

पसंतीवर आधारित श्रेयांक पद्धती

Choice Based Credit System

बी.ए. भाग-३ : B.A. Part-III

अभ्यासक्रम : Syllabus

June, 2020 onward

सत्र-६ : Semister No. 6 : अभ्यासपत्रिका क्र. XVI

Discipline Specific Elective (DSE-E-130)

विद्याशाखीय विशेष निवड (DSE-E-130)

वाङ्मय प्रकाराचे अध्ययन : ललित गद्य (व्यक्तिचित्रे)

पाठ्यपुस्तक : मुलखावेगळी माणसं (संपादन)

शिवाजी विद्यापीठ प्रकाशन, कोल्हापूर

उद्दिष्टे :

१. ललित गद्य वाङ्मयप्रकाराचे स्वरूप अभ्यासणे.

२. व्यक्तिचित्र संकल्पना व स्वरूप समजून घेणे.

३. प्रवाहानुरूप मराठीतील व्यक्तिचित्रांचे स्वरूप अभ्यासणे.

४. 'मुलखावेगळी माणसं'मधील व्यक्तिविशेषांचे आकलन करून घेणे.

५. 'मुलखावेगळी माणसं'मधील शैक्षणिक,सामाजिक,सांस्कृतिक,राजकीय पर्यावरण आणि कौटुंबिक भावविश्व अभ्यासणे.

६. 'मुलखावेगळी माणसं'मधील ग्रामीण व उपेक्षितांच्या जीवनाचे आकलन करून घेणे.

७. 'मुलखावेगळी माणसं'मधील अभिव्यक्ती, निवेदनशैली व भाषाविशेष अभ्यासणे.

अभ्यासक्रम

अ. क्र. Sr. No.	घटक Topic	अध्यापन तासिका Teaching Hours	श्रेयांक Credit
विभाग १ Module I	ललित गद्य : संकल्पना व स्वरूप व्यक्तिचित्रे : संकल्पना, स्वरूप/वैशिष्ट्ये आणि वाटचाल व्यक्तिचित्र लेखनासाठी आवश्यक गुण	१५	१
विभाग २ Module II	१. रामा मैलकुली – व्यंकटेश माडगूळकर २. मृत्यूचे चुंबन घेणारा महाकवी – प्र. के. अत्रे ३. निळू मांग – अण्णाभाऊ साठे ४. मोरणी – विभावरी शिरूरकर	१५	१
विभाग ३ Module III	५. जमीला जावद – हमीद दलवाई ६. यंकटअण्णा – व. वा. बोधे ७. दगडूमामा – उत्तम कांबळे ८. मुंबईचा चित्रकार – अरुण खोपकर	१५	१
विभाग ४ Module IV	९. हीरा – इंद्रजित भालेराव १०. बाबा मास्तर – दि. बा. पाटील ११. दादासाहेब वस्ताद – सयाजीराजे मोकाशी १२. डोकेवाला संशोधक : दादाजी रामजी खोब्रागडे – व्ही.एन.शिंदे	१५	१

Pattern of Question Paper

एकूण गुण – ४० : Total Marks-40

प्रश्न १	योग्य पर्याय निवडा	०५ गुण
प्रश्न २	अंतर्गत विकल्पासह दीर्घोत्तरी प्रश्न	१५ गुण
प्रश्न ३	अंतर्गत विकल्पासह लघूत्तरी प्रश्न (तीन पैकी दोन)	१० गुण
प्रश्न ४	टिपा लिहा (चार पैकी दोन)	१० गुण

सूचना :

१. विभाग एक वर वस्तुनिष्ठ प्रश्न असणार नाहीत.

२. गटप्रकल्पासाठी अंतर्गत मूल्यमापनाकरिता प्रती विद्यार्थ्यांस दहा गुण आहेत.

गटप्रकल्प विषय :

आपल्या परिसरातील शैक्षणिक, सामाजिक, सांस्कृतिक, कला, क्रीडा, आरोग्य, राजकीय इत्यादी समाजजीवनाच्या कोणत्याही क्षेत्रातील व्यक्तींची व्यक्तिचित्रे लिखित स्वरूपात प्रती प्रकल्पनुरूप ५ (किमान एका प्रकल्पकास एक नुसार) तयार करून ती एकत्रित जमा करावीत.

मूलभूत वाचन :

१. वास्कर, आनंद (संपा.)	*वाङ्मयप्रकार संकल्पना (डॉ.विजय निंबाळकर गौरवग्रंथ), अन्वय प्रकाशन,पुणे*
२. चौघुले, वि. शं.	*मुक्तगद्य : संकल्पना आणि उपयोजन, मॅजेस्टिक प्रकाशन, मुंबई, २००८*
३. शिंदे, रणधीर	*ललित गद्य ते मुक्तगद्य (लेख), दै. महाराष्ट्र टाईम्स, २९–१२–२०१३*
४. मालशे, मिलिंद	*साहित्य प्रकाराची संकल्पना (लेख), साहित्य : अध्यापन आणि प्रकार, (संपा.) श्री. पु. भागवत, सुधीर रसाळ, मौज प्रकाशन, मुंबई, १९८७*
५. हातकणंगलेकर, जहागीरदार, पवार, गो. मा.	*मराठी साहित्य : प्रेरणा आणि स्वरूप, पॉप्युलर प्रकाशन, मुंबई, १९८६*
६. पुरोहित, के. ज.	*लघुनिबंध, साहित्य अकादमी, नवी दिल्ली*

पूरक वाचन :

१. माडगूळकर, व्यंकटेश	*माणदेशी माणसं, मेहता पब्लिशिंग हाऊस, पुणे, पुनर्मुद्रण, २०१८*
२. अत्रे, प्र. के.	*मृत्यूचे चुंबन घेणारा महाकवी : साने गुरूजी, पार्थ पब्लिकेशन, कोल्हापूर,१९६२*
३. साठे, अण्णाभाऊ	*बरबाढ्या कंजारी, श्रमिक प्रतिष्ठान, कोल्हापूर, लोकावृत्ती, २०१०*
४. शिरूरकर, विभावरी	*दोघांचे विश्व आणि इतर काही कथा, कॉन्टिनेन्टल प्रकाशन, पुणे, १९५७*
५. दलवाई, हमीद	*जमीला जावद आणि इतर कथा, साधना प्रकाशन, पुणे, २०१६*
६. बोधे, व. वा.	*गावाकडची माणसं, अक्षरबंध प्रकाशन, पुणे, २००७*
७. कांबळे, उत्तम	*कावळे आणि माणसं, मनोविकास प्रकाशन, पुणे, आ.दु., २०१०*
८. खोपकर, अरुण	*चित्रव्यूह, लोकवाङ्मय गृह, मुंबई*
९. भालेराव, इंद्रजित	*गाई घरा आल्या, प्रतिभास प्रकाशन, परभणी*
१०. पाटील, दि. बा.	*भली माणसं, मनोकामना प्रकाशन, इस्लामपूर, २०१३*
११. मोकाशी, सयाजीराजे	*पंधरा ऑगस्ट, मुक्तरंग प्रकाशन, लातूर, २०१६*
१२. शिंदे, व्ही. एन.	*हिरव्या बोटांचे किमयागार, तेजस प्रकाशन, कोल्हापूर, २०१९*

संदर्भ ग्रंथ :

१. जोशी, प्र. न.	*मराठी वाङ्मयाचा विवेचक इतिहास, अर्वाचीन काळ (१८०० ते १९८०), स्नेहवर्धन प्रकाशन, पुणे*
२. भागवत, श्री. पु.	*साहित्य अध्यापन आणि प्रकार (प्रा. वा. ल. कुलकर्णी गौरवग्रंथ), मौज प्रकाशन गृह, मुंबई*

SHIVAJI UNIVERSITY, KOLHAPUR.

Accredited By NAAC with 'A' Grade

Revised Syllabus For

B.A. Part-III

English

Syllabus to be implemented from

June, 2020 onwards.

Shivaji University, Kolhapur
B. A.III
Compulsory English
Ability Enhancement Compulsory Course (CBCS)
ENGLISH FOR COMMUNICATION
From June 2020 Onwards

Course Objectives:
➢ To enhance students' communication skills
➢ To impart employability skills to students
➢ To prepare students for competitive examinations
➢ To enable students to acquire professional skills such as media writing
➢ To enable students to learn manners and etiquettes required at workplace
➢ To enhance students' reading comprehension skills
➢ To create interest in English literature among students
➢ To inculcate human values and ethics in order to enable students' to become good citizens of the country

Course Outcomes: After the completion of the course, the students will be able to:
➢ Communicate in English, in oral and written modes, in their day-to-day lives as well as at workplaces.
➢ Face job interviews confidently and efficiently.
➢ Acquire soft skills required at workplaces and in real life.
➢ Learn group behavior and team work.
➢ Learn to value and respect others' opinions and views and develop democratic attitude.
➢ Face competitive examinations confidently and efficiently with adequate linguistic confidence.
➢ Acquire professional skills required in media writing such as writing editorials.
➢ Learn to appreciate and enjoy reading poetry and prose passages.
➢ Acquire human values and develop cultured outlook.

SEMESTER V   AECC 5

MODULE I
    A. Interview Skills
    B. The Interview -V.V. John

MODULE II
    A. Grammar for Competitive Examinations
    B. The Lottery - Shirley Jackson

MODULE III
    A. Writing Skills for Competitive Examinations
    B. After Twenty Years - O' Henry

MODULE IV
    A. I Shall Return To This Bengal - Jibananda Das
    B.(i) Song of Youth - A. P. J. Abdul Kalam
      (ii) The Orphan Girl - Henry Derezio

SEMESTER VI   AECC 6

MODULE V
     A. Group Discussion
     B. The Lighthouse Keeper of Aspinwall - Henry Sienkiewicz
MODULE VI
     A. Note Making and Note Taking
     B. Three Questions - Leo Tolstoy
MODULE VII
     A. Media Writing
     B. Eight Rupees - Murli Das Melwani
 MODULE VII
     A. The Mystic Drum - Gabriel Okara
     B. (i) Two Dead Soldiers- Jean Arasanayagam
       (ii) Bora Ring - Judith Wright

*Note: Semester VI: 10 Marks for Internal Evaluation: STUDENTS' GROUP PROJECT

Division of Teaching Hours 8 Modules x 15 Hours = 120 Hours

Shivaji University, Kolhapur
B. A.III
Compulsory English
Ability Enhancement Compulsory Course (CBCS)
ENGLISH FOR COMMUNICATION

PATTERN OF QUESTION PAPER (June 2020 Onwards)

Semester V (Paper E)   **Total Marks: 40**

Q. No	Sub Q.	Type of Question	Based on	Marks
Q. 1	A.	Four multiple choice questions with four alternatives to be set	Prose and Poetry	03
	B.	Answer in one word/phrase/sentence each.	Prose and Poetry	03
	C.	Two different **Vocabulary Exercises** to be set for 1 mark each	Prose and Poetry	02
Q.2	A.	Answer the following questions in 3-4 sentences each. (2 out of 3)	2 on Prose and 1 on Poetry	04
	B.	Write **Short Note** on the following in about 7-8 sentences each. (1 out of 2)	1 on Prose and 1 on Poetry	04
Q.3	--	Questions to be set on **Interview Skills (A or B)**	Module I A	08
Q.4	--	Question to be set on **Grammar for Competitive Examinations (A or B)**	Module II A	08
Q.5	--	Question to set on **Writing Skills for Competitive Examinations(A or B)**	Module III A	08

Semester VI (Paper F)   **Total Marks: 40**

Q. No	Sub Q.	Type of Question	Based on	Marks
Q. 1	A.	Four multiple choice questions with four alternatives to be set	Prose and Poetry	03
	B.	Answer in one word/phrase/sentence each.	Prose and Poetry	03
	C.	Two different **Vocabulary Exercises** to be set for 1 mark each.	Prose and Poetry	02
Q.2	A.	Answer the following questions in 3-4 sentences each. (2 out of 3)	2 on Prose and 1 on Poetry	04
	B.	Write **Short Note** on the following in about 7-8 sentences each. (1 out of 2)	1 on Prose and 1 on Poetry	04
Q.3	--	Question to be set on **Group Discussion(A or B)**	Module V A	08
Q.4	--	Question to be set on **Note Making and Note Taking(A or B)**	Module VI A	08
Q.5	--	Question to set on **Media Writing(A or B)**	Module VII A	08

Shivaji University, Kolhapur
B. A. Part III
Special English
INTRODUCTION TO LITERARY CRITICISM (CBCS)
Discipline Specific Elective
Semester V (Paper VII) (DSE- E11) & Semester VI (Paper XII) (DSE- E136)
From June 2020 onwards

Course Objectives:
- ➢ To introduce students to the major trends in literary criticism.
- ➢ To familiarize students with the major critical concepts.
- ➢ To help students to study the original contributions made in the field of literary criticism.
- ➢ To acquaint students with the various literary and critical movements.
- ➢ To train students to write critical appreciation of poetry.

Course Outcomes:
- ➢ Students are able to understand the major trends in criticism.
- ➢ Students are able to interpret critical concepts.
- ➢ Students are able to study the original contributions to literary criticism.
- ➢ Students are acquainted with literary and critical movements.
- ➢ Students are able to understand the meaning and appreciate the poems critically.

Semester V(Paper VII) (DSE- E11)	
Module I	**Introduction to Literary Criticism:** 1. Nature of Criticism 2. Function of Criticism
Module II	**Classical Criticism:** 1. The Concept of Tragedy 2. The Ideal Tragic Hero (From **Aristotle's** *Poetics*)
Module III	**Neo-classical Criticism:** Dr. Samuel Johnson's *Preface to Shakespeare* (1765)
Module IV	**Literary Terms:** 1. Symbolism 2. Realism 3. Humour 4. Paradox
Note: Semester V: 10 Marks for Internal Evaluation: STUDENTS' SEMINAR	
Semester VI (Paper XII) (DSE- E136)	
Module V	**Romantic Criticism:** William Wordsworth's Theory of Poetic Diction (From **William Wordsworth's** *Preface to Lyrical Ballads*)
Module VI	**Victorian Criticism:** Matthew Arnold's Touchstone Method (From **Matthew Arnold's** *The Study of Poetry*)
Module VII	**Modern Criticism:**

	T S Eliot's *Tradition and Individual Talent* (1919)
Module VIII	**Practical Criticism:**
	Poetry

Note: Semester VI: 10 Marks for Internal Evaluation: STUDENTS' GROUP PROJECT

Division of Teaching Hours 8 Modules x 15 Hours = 120 Hours

Recommended Reading: Semester V and Semester VI

Abrams, M. H. *A Glossary of Literary Terms* (8th Edition). New Delhi: Akash Press, 2007.

Alexander, L. G. *Prose and Poetry Appreciation for Overseas Students*. London: Longman Green and Comp. Ltd., 1966.

Allex,Latter & Rachel, Teubner. *William Wordsworth's Preface to the Lyrical Ballads*. London: Macat Library, 2018.

Bliss, Perry. *A Study of Poetry*. Kindle Edition, 22 Feb., 2018.

Butcher, S. C. *Poetics*. New Delhi: Kalyani Publishers, 1978.

Bywater, Ingram. *Aristotle's Poetics*. Oxford: Atthe Clarendon Press, 1976.

Cuddon, J. A. *The Penguin Dictionary of Literary Terms and Literary Theory* (4th Edition). London and New York: Penguin, 2000.

Davis, Joseph, K. Pathea, R Broughton and Michael Wood. *Literature*. Illinois: Scott, Foresman and Comp. Glenviews, 1977.

Eliot, T.S. *The Sacred Wood – Essays on Poetry and Criticism*. (Seventh edition),1950.

Enright, D.J. & Ernst De Chickera. *English Critical Texts: 16th Century to 20th Century*.OUP, 1968.

Fyfe, Hamilton. *Aristotle's Art of Poetry*. London: OUP, 1940.

Gray, Martin. *A Dictionary of Literary Terms* (York Handbooks), Pearson Education, 2009.

Hudson, W. H. *An Introduction to the Study of Literature*. New Delhi: Atlantic, 2007.

Richards, I. A. *Practical Criticism: A Study of Literary Judgment.* New Delhi: UBS Publishers, 2002.

Scott James, R. A. *The Making of Literature*. Mumbai: Allied Publishers Pvt. Ltd., 1963.

Sherbo, Arthur(ed.). *The Yale edition of the works of Samuel Johnson*.Vol.7. New haven: Yale University Press,1968.

S. Ramaswami & V. S. Seturaman (ed.) *The English Critical Tradition: An Anthology of English Literary Criticism*, Volume 1,. New Delhi: Macmillan Publishers India Ltd. 1977/2009.

Seturaman, V. S., C. T. Indra and T. Siraman. *Practical Criticism*. Madras: Macmillan India Ltd., 1995.

Waugh, Patricia (ed.) *Literary Theory and Criticism: An Oxford Guide*. New York: Oxford University Press, 2006.

Wimsatt, W. K. and Cleanth Brooks. *Literary Criticism: A Short History*. New Delhi: Oxford and IBH Publishing Company Pvt. Ltd., 1957.

Wellek, Rene and Austin Warren. *Theory of Literature.* London: Jonathan Cape, 1949.

Shivaji University, Kolhapur
B. A. Part III
Special English
INTRODUCTION TO LITERARY CRITICISM (CBCS)
Discipline Specific Elective
Semester V (Paper VII) (DSE- E11)
PATTERN OF QUESTION PAPER
From June 2020 onwards

Total Marks: 40

Q1. Objective type Question
    A) Multiple choice questions with four alternatives.   4
    B) Answer the following questions in one word/phrase/sentence each.   4
    (Q1 A and B to be set on topics covering **Module I to IV**)
        (At least one item to be set on each Module)
Q2. Answer the questions in about 250-300 words each.
    (A or B to be set on **Module I, II, and III**)   10
Q3. Answer the questions in about 250-300 words each.
    (A or B to be set on **Module I, II, and III**)   10
Q3 A. Write short notes on the following: (Any 3 out of 5)   12
(3 to be set on **Module IV** and 2 on **Module I, II, III** not covered in question 2 and 3)

INTRODUCTION TO LITERARY CRITICISM (CBCS)
Semester VI (Paper XII) (DSE- E136)
PATTERN OF QUESTION PAPER
From June 2020 onwards

Total Marks: 40

Q1. Objective type Question
    A) Multiple choice questions with four alternatives.   4
    B) Answer the following questions in one word/phrase/sentence each.   4
    (Q1. A and B to be set on topics covering **Module V to VII**)
        (At least one item to be set on each Module)
. Q2. Answer in the questions 250-300 words each.   10
    (A or B to be set on **Module V, VI, and VII**)
Q3. Answer the questions in about 250-300 words each.   10
    (A or B to be set on **Module V, VI, and VII**)
Q4. Write critical appreciation of the given poem.   12
(with the help of points such as title, theme, content, devices, message, style, rhyme-scheme, diction, type of poem, tone, stanza-pattern, metre, etc. (**Based on Module VIII**)

EQUIVALENCE

Old Title	New Title
LITERARY CRITICISM AND LITERARY APPRECIATION	**INTRODUCTION TO LITERARY CRITICISM**

Shivaji University, Kolhapur
B. A.III
English Special
ENGLISH POETRY (CBCS)
Discipline Specific Elective
Semester V (Paper VIII) (DSE – E12) and Semester VI (Paper XIII) (DSE – E137)
(From June 2020 Onwards)

Course Objectives:
- ➢ To make students engaged and curious readers of poetry
- ➢ To introduce students to poetry from various cultures and traditions
- ➢ To make students understand that poetry gives intellectual, moral and linguistic pleasures
- ➢ To make students hear and read poems aloud and to memorize lines

Course Outcomes:
- ➢ Students will be able to trace the development of the poetry in English from the days of Shakespeare to the contemporary India.
- ➢ Students will be able to appreciate and analyze the poems properly.
- ➢ Students will have a fairly comprehensive view of the Western and Eastern poetic tradition and they will be able to relate it to various literary movements.
- ➢ Students will have an insight into poetry and they will be able to make a lively and interesting reading.

SEMESTER V (Paper VIII) (DSE – E12)		
MODULE NO.	**TITLE OF THE MODULE**	**NAME OF THE POET**
I.	**Topics For Background Readings:**	
1.	Elizabethan Poetry	
2.	Metaphysical Poetry	
3.	Romantic Poetry	
II. Selections from Elizabethan Poetry:		
1.	Sweet Warrior (Sonnet 57)	Edmund Spenser
2.	Sonnet To The Moon	Sir Philip Sydney
3.	Full Many A Glorious Morning… (Sonnet 33)	William Shakespeare
III. Selections from Metaphysical Poetry:		
1.	The Sun Rising	John Donne
2.	The Retreat	Henry Vaugham
3.	The Collar	George Herbert
IV. Selections from Romantic Poetry:		
1.	My Heart Leaps Up	William Wordsworth
2.	The Rime of the Ancient Mariner	S. T. Coleridge
3.	Ozymandias	P. B. Shelley
4.	When We Two Parted	Lord Byron
*Note: Semester V: 10 Marks for Internal Evaluation: STUDENTS' SEMINAR		

SEMESTER VI (Paper XIII) (DSE – E137)		
MODULE NO.	TITLE OF THE MODULE	NAME OF THE POET
V.	**Topics For Background Readings:**	
	1. Victorian Poetry	
	2. Modern English Poetry	
	3. Modern Indian English Poetry	
VI. Selections from Victorian Poetry:		
	1. The Lady Of Shallot	Alfred Lord Tennyson
	2. My Last Duchess	Robert Browning
	3. Love Came Down At Christmas	Christiana Rossetti
VII. Selections from Modern English Poetry:		
	1. No Second Troy	W. B. Yeats
	2. The Hollow Men	T. S. Eliot
	3. Tonight I Can Write	Pablo Neruda
VIII. Selections from Modern Indian English Poetry:		
	1. The Professor	Nissim Ezekiel
	2. A Hot Noon in Malabar	Kamala Das
	3. A River	A. K. Ramanujan
	4. A Kind of Happiness	Jayanta Mahapatra
*Note: Semester VI: 10 Marks for internal Evaluation: STUDENTS' GROUP PROJECT		

Division of Teaching Hours: 8 Modules x 15 Hours each= 120 Hours

Recommended Reading: Semester V and Semester VI
Appelbaum, Stanley. *English Romantic Poetry: An anthology*. Dover Publications Inc. 1996.
Burrow, Colin. *Metaphysical Poetry*. Penguin Classics. 2006.
Chaudhuri, Roshinka. *A History of Indian Poetry in English*. Cambridge University press. 2016.
Chaudhuri, Sukanta. *Modern Indian Literature*, New Delhi: OUP, 2004.
Courthope, W.J. *A History of English Poetry*. Vol.I Macmillan, 1995.
Craig, W.J. (ed.). *The Complete works of William Shakespeare*. Oxford: OUP., 1905.
Fenton,James. *An Introduction to English Poetry*. New York: Farrar, Strauss and Giroux, 2004.
Gardner, Martin, *The Annotated Ancient Mariner,* New York:Clarkson Potter,1965.
Harold Bloom and Lionel Trilling. (ed.) *Romantic Prose and Poetry,* New York: OUP, 1973.
Mitra, Zinia(ed.). Indian *Poetry in English:Critical Essays*. New Delhi: PHI Learning Pvt
      Ltd.,2012.
Naik, M.K. *A History of Indian English Literature*. Delhi, 1982.
Narasimhaiah, C.D., (ed.) *An Anthology of Commonwealth Poetry,*Delhi: Macmillan, 1990.
Negri,Paul. *English Victorian poetry*. Dover Publications Inc. 1998
Ramanan, M.G. *Modern English Poetry: A Selection*. New Delhi:Orient Blackswan,2013.
Samuel Taylor Coleridge, *Biographia Literaria,* ed. George Watson. London: Everyman, 1993.

Shivaji University, Kolhapur
B. A.III
English Special
ENGLISH POETRY (CBCS)
Discipline Specific Elective
Semester V (Paper VIII) (DSE – E12)

PATTERN OF QUESTION PAPER **From June 2020 Onwards**

Marks: 40

Q1. A) Four multiple choice questions with four alternatives   (4)

   B) Answer the following questions in one word/ phrase/sentence each.   (4)

   (Q. 1 A and B to be set on **Module II, III and IV**)

Q.2. Answer the following questions in about 250-300 words.   (10)

   (A or B to be set on **Module I**)

Q.3. Answer the following questions in about 250-300 words.   (10)

   (A or B to be set on **Module II, III or IV**)

Q.4. Write Short Notes in about 100-150 words each (3out of 4)   (12)

   (Two be set on **Module I** and two be on **Module II, III or IV**)

ENGLISH POETRY (CBCS)
Discipline Specific Elective
Semester VI (Paper XIII) (DSE – E137)

Marks: 40

Q1. A) Four multiple choice questions with four alternatives   (4)

   B) Answer the following questions in one word/ phrase/sentence each.   (4)

   (Q. 1 A and B to be set on **Module VI, VII and VIII**)

Q.2. Answer the following questions in about 250-300 words.   (10)

   (A or B to be set on **Module V**)

Q.3. Answer the following questions in about 250-300 words.   (10)

   (A or B to be set on **VI, VII or VIII**)

Q.4. Write Short Notes in about 100-150 words each (3out of 4)   (12)

   (Two be set on **Module V** and two be on **Module VI, VII or VIII**)

EQUIVALENCE

Old Title	New Title
Understanding Poetry	**English Poetry**

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Shivaji University, Kolhapur
B. A. Part III
Special English
ENGLISH DRAMA (CBCS)
Discipline Specific Elective
Semester V (Paper IX) ((DSE – E13) & Semester VI (Paper XIV) (DSE – E138)
From June 2020 onwards

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Course Objectives:
- ➢ To make students understand different forms of drama
- ➢ To enable students to relate drama to their ideological or socio-political contexts
- ➢ To help students improve their creative and imaginative faculties through the reading of drama
- ➢ To enable students to know about various aspects of the drama

Course Outcomes:
- ➢ Students are able to understand different forms of drama.
- ➢ Students are able to relate drama to their ideological or socio-political contexts.
- ➢ Students are able to improve their creative and imaginative faculties through the reading of drama.
- ➢ Students are able to know about various aspects of the drama.

<div align="center">

Semester V (Paper IX) ((DSE – E13)

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MODULE I
    Definition and Elements of Drama
MODULE II
    Tragedy as a Form
MODULE III
    The Importance of Being Earnest - Oscar Wilde
MODULE IV
    Hamlet – William Shakespeare

Division of Teaching Hours: 4 Modules X 15 Periods = 60 Periods
Prescribed Texts:
Wilde, Oscar. *The Importance of Being Earnest.* New Delhi: General Press, 2018.
Shakespeare, William. *Hamlet*. Penguin Books, 1980.

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*Note: Semester V: 10 Marks for Internal Evaluation: STUDENTS' SEMINAR

<div align="center">

Semester VI (Paper XIV) (DSE – E138)

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MODULE V
    Types of Drama
MODULE VI
    Comedy as a Form
MODULE VII
    Nagmandala – Girish Karnad
MODULE VIII
    Harvest – Manjula Padmanabhan

Division of Teaching Hours: 4 Modules X 15 Periods = 60 Periods
Prescribed Texts:
Karnad, Girish. *Nagmandala.* Oxford University Press, 1990.
Padmanabhan, Manjula. *Harvest.* Delhi: Penguin, 1997.

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*Note: Semester VI: 10 Marks for Internal Evaluation: STUDENTS' GROUP PROJECT

Recommended Reading: Semester V and Semester VI

Aasand, Hardin L. *Stage Directions in Hamlet: New Essays and New Directions*. NJ: Fairleigh
        Dickinson University Press, 2003.
Babu, Munchi Sarat. *Indian Drama.* New delhi: Prestige Books, 1997.
Bhatt, S.K. *Indian English Drama: A Critical Study.* New Delhi: Sterling Publishers Pvt. Ltd.,
        1987.
Bloom, Harold. *The Importance of Being Earnest: Modern Critical Interpretations.* Chelsea
        House Pub., 1988.
Driver, T.F. *Drama and History*. New York: Columbia University Press, 1967.
Ddiya, Jaydipsinh. (ed.) *The Plays of Girish Karnad: Critical Perspectives*. New Delhi: Prestige
        Books, 1999.
Gargy, Balwant. *Folk Theatre of India*. Culcutta: Rupa & Co., 1991.
Gillespie, Michael Patrick. *The Importance of Being Earnest.*(Norton Critical Editions).
        W.W.Norton and Co., 2006.
Hibbard, G.R. (ed.) *Hamlet*. OUP: 1988.
Hirsh, James. Shakespeare and the History of Soliloquies. NJ: Farleigh Dickinson University
        Press, 2003.
Joshi, R.G. *Myth in Indian Drama.* Delhi: B.R. Publishing Corporation, 1984.
Kumar, Nand. *Indian English Drama: A Study in Myths*. New Delhi: Sarup and sons, 2003.
MacCary, Thomas. *Hamlet: A Guide to the Play*. London: Greenwood Press, 1988.
Martin, James. *The Meaning of the 21st Century*. New York: Riverhead Penguin, 2007.
Priestley, J.B. *The Art of the Dramatist*. London: Heinemann, 1957.
Rajkumar, K. *Socio-Political Realities in Harvest*. Purna:RHI,Mahmul, 2012.
Robertson, Ronald. *Globalization: Social Theory and Global Culture*. London: Sage, 1992.
Sen,B. *The Importance of Being Earnest.* Unique Publishers,2015.
Styan, J.L. *The Elements of Drama*. Cambridge: Cambridge University Press, 1967.
Vaidyanathan, G. *The Importance of Being Earnest.* New Delhi: Narain Publications, 2018.
Worthen, W.B. (ed.). *Anthology of Drama* (Fourth edition). London: Cengage Learning
        EMEA, 2004.

B. A. Part III
Special English
ENGLISH DRAMA (CBCS)
Discipline Specific Elective
Semester V (Paper IX) ((DSE – E13)
PATTERN OF QUESTION PAPER   **(From June 2020 onwards)**

Marks: 40

Q1. A) Four multiple choice questions with four alternatives   (4)

     B) Answer the following questions in one word/ phrase/sentence each.   (4)

         (Q. 1 A and B to be set on **Module III and IV**)

Q.2. Answer the following questions in about 250-300 words.   (10)

         (A or B to be set on **Module I and II**)

Q.3. Answer the following questions in about 250-300 words.   (10)

         (A or B to be set on **Module III and IV**)

Q.4. Write Short Notes in about 100-150 words each (3out of 4)   (12)

         (Two be set on **Module I and II** and two be on **Module III and IV**)

ENGLISH DRAMA (CBCS)
Discipline Specific Elective
Semester VI (Paper XIV) (DSE – E138)
PATTERN OF QUESTION PAPER   **(From June 2020 onwards)**

Marks: 40

Q1. A) Four multiple choice questions with four alternatives   (4)

     B) Answer the following questions in one word/ phrase/sentence each.   (4)

         (Q. 1 A and B to be set on **Module VII and VIII**)

Q.2. Answer the following questions in about 250-300 words.   (10)

         (A or B to be set on **Module V and VI**)

Q.3. Answer the following questions in about 250-300 words.   (10)

         (A or B to be set on **VII and VIII**)

Q.4. Write Short Notes in about 100-150 words each (3out of 4)   (12)

         (Two be set on **Module V and VI** and two be on **Module VII and VIII**)

EQUIVALENCE

Old Title	New Title
Understanding Drama	**English Drama**

Shivaji University, Kolhapur
B. A. Part III Special English
ENGLISH NOVEL (CBCS)
Discipline Specific Elective
Semester V (Paper X) ((DSE – E14) & Semester VI (Paper XV) (DSE – E139)
From June 2020 onwards

Course Objectives:
- ➢ To make students understand different forms of novel.
- ➢ To enable students to relate novels to their ideological or socio-political contexts.
- ➢ To help students to improve their creative and imaginative faculties through the reading of novels.
- ➢ To enable students to know about various aspects of the novel.

Course Outcomes:
- ➢ Students are able to understand different forms of novel.
- ➢ Students are able to relate novels to their ideological or socio-political contexts.
- ➢ Students are able to improve their creative and imaginative faculties through the reading of novels.
- ➢ Students are able to know about various aspects of the novel.

SEMESTER V (Paper X) (DSE – E14)

MODULE I
    Rise and Development of the Novel
MODULE II
    Aspects of the Novel
MODULE III
    The Old Man and the Sea – Ernest Hemingway
MODULE IV
    The Power and the Glory – Graham Greene

Division of Teaching Hours: 4 Modules X 15 Periods = 60 Periods

Prescribed Texts:
Hemingway, Ernest. *The Old Man and the Sea.* New York: Simon & Schuster, 1952.
Greene, Graham. *The Power and the Glory.* New York: Time Reading Special Edition. 1940, 1962.

*Note: Semester V: 10 Marks for Internal Evaluation: STUDENTS' SEMINAR

SEMESTER VI (Paper XV) (DSE – E139)

MODULE V
    Historical and Psychological Novel
MODULE VI
    Satirical Novel and Epistolary novel
MODULE VII
    Animal Farm: A Fairy Tale - George Orwell
MODULE VIII
    The Guide - R. K. Narayan
Division of Teaching Hours: 4 Modules X 15 Periods = 60 Periods

Prescribed Texts:
Orwell, George. *Animal Farm: A Fairy Tale*. New York: Signet Classic, 1996.
Narayan, R. K. *The Guide*. US: Viking Press, 1958.

*Note: Semester VI: 10 Marks for internal Evaluation: STUDENTS' GROUP PROJECT

Suggested Reading: for Semester V and Semester VI

Auden,W.H. *The Enchafed Flood: The Romantic Econography of the Sea*. New York: Random,
          1950.
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Lewis,R.w.B. & Conn, Petr J.ed. *Graham Greene: The Power and the Glory: Text and Criticism*.
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Rees, R. J. *Introduction to English Literature*. London: Macmillan, 1966/1968.
Singh, P.K. *The Novels of R. K. Narayan :A Critical Study*. New Delhi: Atlantic Publishers.
Stade, George, ed. *Six Contemporary British Novelists*. New York: Colombia University Press,
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Subramaniam, K.S. *Graham Greene: A Study of Graham Greene's Works*. Bareilly: Prakash
          Book Depot, 1978.
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Watt, Ian.. *Rise of the Novel*. London: Penguin, 1957.
Woodcock, George. *20th Century Fiction*. London: The Macmillan Press Ltd., 1983.

ENGLISH NOVEL (CBCS)
From June 2020 onwards
PATTERN OF QUESTION PAPER FOR
(Semester V Paper X DSE – E14)

Marks: 40

Q1. A) Four multiple choice questions with four alternatives (4)

   B) Answer the following questions in one word/ phrase/sentence each. (4)

     (Q. 1 A and B to be set on **Module III and IV**)

Q.2. Answer the following questions in about 250-300 words. (10)

     (A or B to be set on **Module I and II**)

Q.3. Answer the following questions in about 250-300 words. (10)

     (A or B to be set on **Module III and IV**)

Q.4. Write Short Notes in about 100-150 words each (3out of 4) (12)

     (Two be set on **Module I and II** and two be on **Module III and IV**)

PATTERN OF QUESTION PAPER FOR
(Semester VI Paper XV DSE – E139)

Marks: 40

Q1. A) Four multiple choice questions with four alternatives (4)

   B) Answer the following questions in one word/ phrase/sentence each. (4)

     (Q. 1 A and B to be set on **Module VII and VIII**)

Q.2. Answer the following questions in about 250-300 words. (10)

     (A or B to be set on **Module V and VI**)

Q.3. Answer the following questions in about 250-300 words. (10)

     (A or B to be set on **VII and VIII**)

Q.4. Write Short Notes in about 100-150 words each (3out of 4) (12)

     (Two be set on **Module V and VI** and two be on **Module VII and VIII**)

EQUIVALENCE

Old Title	New Title
Understanding Novel	**English Novel**

Shivaji University, Kolhapur
B.A. III
English Special
LANGUAGE AND LINGUISTICS (CBCS)
Discipline Specific Elective
Semester V –Paper XI (DSE - E15) & Semester VI – Paper XVI (DSE - E140)
From June 2020 onwards

LANGUAGE AND LINGUISTICS
Semester V –Paper XI (DSE -E 15)

Course Objectives:
- ➢ To orient students to the concept of communication.
- ➢ To make the students familiar with varieties of the English language.
- ➢ To acquaint students with different levels of the study of language.
- ➢ To study the basic units of grammar.

Course Outcomes:
- ➢ Students know the concept of communication.
- ➢ Students are familiar with varieties of the English language.
- ➢ Students know different levels of study of the English language.
- ➢ Students know basic units of grammar.

Semester V –Paper XI   DSE - E 15

MODULE I
Language and Communication
 i. Definitions and characteristics of language
ii. Human and Animal communication systems (Special reference to
        Hockett's 7 characteristics of language)
MODULE II
Phonology
MODULE III
Morphology
MODULE IV
Words

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*Note: Semester V: 10 Marks for Internal Evaluation: STUDENTS' SEMINAR

Division of Teaching Hours: 4 Modules X 15 Periods = 60 Periods

Reference Books :

Balasubramaniam, T. *A Textbook of English Phonetics for Indian Students*, Delhi: McMillan, 1981.

Bansal, R.K. & Harrison, J.B., *Spoken English,* Hyderabad: Orient Longman, 2000.

Hockett, C.F., *A Course in Modern Linguistics*, MacMillan, . 1963.

Hudson, Richard, *Sociolinguistics,* Cambridge: Cambridge University Press, 1996.

Jones, Daniel, *English Pronouncing Dictionary,* ELBS Edition.

Leech et al, *English Grammar Today: a New Introduction*, Hyderabad: McMillan, 2010.

Lyons, John, *Language and Linguistics: An Introduction,* Cambridge: Cambridge University Press, 1981.

Quirk, R., Greenbaum, S., Leech, G. &Svartvik, J., *A Comprehensive Grammar of English*, New Delhi: Pearson, 2010.

Quirk, Randolph &Greenbaum, Sidney, *A University Grammar of English*, New Delhi: Pearson, 2015.

Radford, A., Atkinson, M., Britain, D., Clahsen, H. & Spencer, A., *Linguistics: An Introduction*, Cambridge: Cambridge University Press, 1999.

Trask, R. L, *Key Concepts in Language and Linguistics*, London: Routledge, 1999.

Verma, S.K. &Krishnaswamy, N., *Modern Linguistics,* Hyderabad: Oxford University Press, 1989.

Velayudhan, S. &Mohanan, K. P., *An Introduction to the Phonetics and Structure of English*, New Delhi: Somaiya Pub. Pvt. Ltd., 1977

QUESTION PAPER PATTERN   **From June 2020 onwards**

LANGUAGE AND LINGUISTICS (CBCS)
Discipline Specific Elective
Semester V –Paper XI (DSE - E15)

Q. 1	Objective type	
	a) Three term labels	(3)
	b) Transcription of words with primary stress	(3)
	c) Conversion of the given transcriptions into the conventional spellings	(2)
Q.2	a) Write short notes (2/3) (to be set on **Module I**)	(10)
	b) Morphological Analysis giving labels (2/4)	(4)
Q.3	a) Identification of word formation/morphological processes	(4)
	d) Identification of word classes	(4)
Q.4.	Write short notes (2/4) (2 each to be set on **Module II & IV)**	(10)

Shivaji University, Kolhapur
B.A. III
English Special
LANGUAGE AND LINGUISTICS (CBCS)
Discipline Specific Elective
Semester VI – Paper XVI (DSE - E140)
From June 2020 onwards

Course Objectives:
➢ To acquaint students with structures and functions of words and phrases.
➢ To enable students to know and identify elements and types of clauses.
➢ To study Subordination and Coordination.
➢ To study different ways of structuring clauses.

Course Outcomes:
➢ Students know words and phrases.
➢ Students know and identify elements and types of clauses.
➢ Students know types of sentences.
➢ Students know the different ways of structuring clauses
.

Semester VI – Paper XVI (DSE - E140)

MODULE V
   Phrases
MODULE VI
   Clauses
MODULE VII
   Subordination and Coordination
MODULE VIII
    Basic and Derived Structures
   i)   Inversion / Fronting
      ii. Negation
      iii. Interrogation
      iv. Exclamation
      v. Omission of Certain Elements
         (Relative Pronouns, Comparative Clauses, Tag Questions)
      vi. Passivisation
      vii. Subject Raising
      viii. Style Transformation

Note: Semester VI: 10 Marks for Internal Evaluation: STUDENTS' GROUP PROJECT

Division of Teaching Hours: 4 Modules X 15 Periods = 60 Periods

Reference Books :

Crystal, David, *Linguistics*, London: Penguin Books Ltd., 1974.

Hockett, C.F., *A Course in Modern Linguistics*, MacMillan, 1963.

Hudson, Richard, *Sociolinguistics,*Cambridge: Cambridge University Press, 1996.

Leech et al, *English Grammar Today: A New Introduction*, Hyderabad: McMillan, 2010.

Lyons, John, *Language and Linguistics: An Introduction,* Cambridge: Cambridge University Press, 1981.

Palmer, F. G., *Grammar*, London: Penguin Books Ltd., 1973.

Quirk, R., Greenbaum, S., Leech, G. &Svartvik, J., *A Comprehensive Grammar of English*, New Delhi: Pearson, 2010.

Quirk, Randolph &Greenbaum, Sidney, *A University Grammar of English*, New Delhi: Pearson, 2015.

Radford, A., Atkinson, M., Britain, D., Clahsen, H. & Spencer, A., *Linguistics: An Introduction*, Cambridge: Cambridge University Press,1999.

Verma, S.K. &Krishnaswamy, N., *Modern Linguistics,* Hyderabad: Oxford University Press, 1989.

QUESTION PAPER PATTERN   **From June 2020 onwards**

LANGUAGE AND LINGUISTICS (CBCS)
Discipline Specific Elective
Semester VI – Paper XVI (DSE - E140)

Q. 1	a) Identify elements of clause (S, P, O, C, A)	(4/6)	(4)
	b)Transformation of sentence (to be set on **Module VIII**)	(4/6)	(4)
Q.2	a) Write short notes. (2 each to be set on **Module V & VI**)	(2/4)	(10)
	b) Give form and function labels to the underlined phrases.	(4/6)	(4)
Q.3	a) Write short notes (To be set on **Module VII**)	(2/3)	(10)
	b) Identify the subordinate clauses and state their form and function.	(4/6)	(4)
Q. 4.	Do as directed. (to be set on **Module VIII**)	(4/6)	(4)

EQUIVALENCE

OLD TITLE	NEW TITLE
THE STRUCTURE AND FUNCTION OF MODERN ENGLISH	LANGUAGE AND LINGUISTICS

SHIVAJI UNIVERSITY, KOLHAPUR.

Accredited By NAAC with 'A' Grade

Revised Syllabus For

B.A. Part-III

Hindi.

Syllabus to be implemented from

June, 2020 onwards.

शिवाजी विश्वविद्यालय, कोल्हापुर

हिंदी अध्ययन मंडल

जून 2020 से लागू

हिंदी स्पेशल बी.ए.–3 (कला)

सत्र–V, VI

Discipline Specific Elective

(शैक्षिक वर्ष –2020–21, 2021–22, 2022–23)

प्रस्तुत पाठ्यक्रम का निर्माण विश्वविद्यालय अनुदान आयोग, नई दिल्ली की मॉडल पाठ्यचर्या (**CBCS**) के आलोक में किया गया है।

सत्र–V
प्रश्नपत्र– VII   : विधा विशेष का अध्ययन।
प्रश्नपत्र– VIII   : साहित्यशास्त्र ।
प्रश्नपत्र– IX   : हिंदी साहित्य का इतिहास।
प्रश्नपत्र– X   : प्रयोजनमूलक हिंदी ।
प्रश्नपत्र– XI   : भाषा विज्ञान और हिंदी भाषा ।
सत्र–VI
प्रश्नपत्र– XII   : विधा विशेष का अध्ययन।
प्रश्नपत्र– XIII   : साहित्यशास्त्र और हिंदी आलोचना।
प्रश्नपत्र– XIV   : हिंदी साहित्य का इतिहास।
प्रश्नपत्र– XV   : प्रयोजनमूलक हिंदी ।
प्रश्नपत्र– XVI   : भाषा विज्ञान और हिंदी भाषा ।

सत्र V और VI : परीक्षा में एक प्रश्नपत्र 50 अंकों का होगा, जिसमें 40 अंक लिखित परीक्षा के और 10 अंक अंतर्गत मूल्यांकन के लिए है। जिसमें सेमिनार, मौखिकी, परियोजना, (प्रोजेक्ट) गृहकार्य, में से एक देना अनिवार्य है।

शिवाजी विश्वविद्यालय, कोल्हापुर

हिंदी अध्ययन मंडल

जून 2020 से लागू

हिंदी स्पेशल बी.ए.–3 (कला)

सत्र –V प्रश्नपत्र– VII

विधा विशेष का अध्ययन

Discipline Specific Elective (D.S.E.-E6)

(शैक्षिक वर्ष –2020 –21, 2021–22, 2022–23)

प्रस्तुत पाठ्यक्रम का निर्माण विश्वविद्यालय अनुदान आयोग, नई दिल्ली की मॉडल पाठ्यचर्या (**CBCS**) के आलोक में किया गया है।

पाठ्यक्रम

उद्देश्य :

1.नाटककार कुसुम कुमार की बहुमुखी प्रतिभा से परिचित कराना।

2.नाटककार कुसुम कुमार के साहित्य से परिचित कराना।

3.नाटककार कुसुम कुमार की विचारधारा से परिचित कराना।

4.नाटककार कुसुम कुमार के निर्धारित ग्रंथ का सूक्ष्म आलोचनात्मक अध्ययन कराना।

5.लेखिका के नाटककार के रूप में साहित्यिक स्थान को निर्धारित कराना।

अध्यापन पद्धति

- स्वाध्याय .

- व्याख्यान, विवेचन तथा विश्लेषण

- संगोष्ठी तथा समूह चर्चा का आयोजन।

- अतिथियों एवं विद्वानों के व्याख्यान।

- दृक श्राव्य माध्यमों का प्रयोग।

- संगणक तथा इंटरनेट आदि साधनों का प्रयोग।

पाठ्यपुस्तक

'दिल्ली ऊँचा सुनती है' (नाटक) –कुसुम कुमार

किताबघर प्रकाशन, अन्सारी रोड, दरियागंज,

नई दिल्ली–110002

इकाई 1 कुसुम कुमार का जीवन परिचय, व्यक्तित्व, कृतित्व एवं नाटककार कुसुम कुमार का सामान्य परिचय ।

इकाई 2 'दिल्ली ऊँचा सुनती है'– कथावस्तु एवं शीर्षक की सार्थकता।

इकाई 3 'दिल्ली ऊँचा सुनती है'– पात्र एवं चरित्र –चित्रण, संवाद, देशकाल वातावरण।

इकाई 4 'दिल्ली ऊँचा सुनती है'– भाषा शैली, उद्देश्य अभिनेयता एवं समस्याएँ।

प्रश्नपत्र का स्वरूप एवं अंक विभाजन		अंक
प्रश्न 1	पूरे पाठ्यक्रम पर दस बहुविकल्पी प्रश्न	10
प्रश्न 2	'दिल्ली ऊँचा सुनती है' पर ससंदर्भ प्रश्न (3 में से 2)	10
प्रश्न 3	'दिल्ली ऊँचा सुनती है' एवं कुसुम कुमार पर लघुत्तरी प्रश्न (3 में से 2)	10
प्रश्न 4	'दिल्ली ऊँचा सुनती है' पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)	10

संदर्भ ग्रंथ सूची–

* डॉ. कुसुम कुमार एक प्रयोगधर्मी नाटककार– डॉ.दत्तात्रय मोहिते, विद्या प्रकाशन, 'सी' 449, गुजैनी, कानपुर–208022

* स्वांत्र्योत्तर हिंदी नाटक–डॉ.रंजन तिवारी, विद्या प्रकाशन, कानपुर–208022

* हिंदी महिला नाटककार–डॉ.भगवान जाधव, विद्या प्रकाशन, कानपुर–208022

* समकालीन हिंदी नाटक– डॉ. जशवंतभाई पंडया, ज्ञान प्रकाशन, कानपुर

DSE-E131

उद्देश्य :

- उपन्यास के तात्त्विक स्वरूप का परिचय देना।

- उपन्यासकार के व्यक्तित्व एवं कृतित्व से परिचित कराना।

- रचना विशेष का महत्त्व समझने एवं मूल्याकंन करने की क्षमता बढाना।

- रचना के आस्वादन एवं समीक्षा की क्षमता विकसित कराना।

- पाठ्यक्रम में निर्धारित उपन्यास की प्रासंगिकता से अवगत कराना।

पाठ्यपुस्तक –अंतिम साक्ष्य (उपन्यास)–चंद्रकांता

अमन प्रकाशन, 104 A/80 सी रामबाग, कानपुर– 12

इकाई 1. चंद्रकांता का जीवन परिचय, व्यक्तित्व, कृतित्व एवं उपन्यासकार चंद्रकांता का सामान्य परिचय ।

इकाई 2. 'अंतिम साक्ष्य'–कथावस्तु एवं शीर्षक की सार्थकता।

इकाई 3. 'अंतिम साक्ष्य'–पात्र एवं चरित्र –चित्रण तथा संवाद ।

इकाई 4. 'अंतिम साक्ष्य'–देशकाल तथा वातावरण, भाषा शैली, उद्देश्य एवं समस्याएँ ।

प्रश्नपत्र का स्वरूप एवं अंक विभाजन		अंक 40
प्रश्न 1	पूरे पाठ्यक्रम पर दस बहुविकल्पी प्रश्न	10
प्रश्न 2	'अंतिम साक्ष्य' पर ससंदर्भ प्रश्न (3 में से 2)	10
प्रश्न 3	'अंतिम साक्ष्य' एवं चंद्रकांता पर लघुत्तरी प्रश्न (3 में से 2)	10
प्रश्न 4	'अंतिम साक्ष्य' पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)	10

संदर्भ ग्रंथ सूची –

- चंद्राकांता का कथा साहित्य–समकालीन परिवेश तथा संदर्भ–डॉ.अमोल पालकर, विद्या प्रकाशन, कानपुर–208022

- चंद्राकांता का कथा साहित्य–डॉ.जगदीश चव्हाण, विद्या प्रकाशन, कानपुर–208022

शिवाजी विश्वविद्यालय, कोल्हापुर

हिंदी अध्ययन मंडल

जून 2020 से लागू

हिंदी स्पेशल बी.ए.–3 (कला)

सत्र –V प्रश्नपत्र– VIII

साहित्यशास्त्र

Discipline Specific Elective (D.S.E.-E7)

(शैक्षिक वर्ष –2020 –21, 2021–22, 2022–23)

प्रस्तुत पाठ्यक्रम का निर्माण विश्वविद्यालय अनुदान आयोग, नई दिल्ली की मॉडल पाठ्यचर्या (CBCS) के आलोक में किया गया है।

उद्देश्य :

1) साहित्य निर्मिति की प्रक्रिया का बोध कराना।

2) साहित्य /काव्य के विभिन्न अंगों, भेदों से परिचित कराना।

3) साहित्य /काव्य की नवीन विधाओं से परिचित कराना।

4) समीक्षा सिद्धांतों से परिचित कराना।

5) साहित्य /काव्य के तत्वों से परिचित कराना।

6) अलंकारों से परिचित कराना।

अध्यापन पद्धति –

- स्वाध्याय .

- व्याख्यान, विवेचन तथा विश्लेषण

- भारतीय एवं पाश्चात्य साहित्यशास्त्र का सैद्धांतिक एवं अनुप्रयोग की दृष्टि से।

- संगोष्ठी तथा समूह चर्चा का आयोजन।

- अतिथियों एवं विद्वानों के व्याख्यान।

- दृक श्राव्य माध्यमों का प्रयोग।

- संगणक तथा इंटरनेट आदि साधनों का प्रयोग।

अध्ययनार्थ विषय –

इकाई 1 काव्य / साहित्य – स्वरूप, तत्व, प्रयोजन।

इकाई 2 काव्य के प्रकार, काव्य गुण, काव्य दोष।

इकाई 3 रस – स्वरूप, रस के अंग, रस के भेद।

इकाई 4 अलंकार – शब्दालंकार –अनुप्रास, वक्रोक्ति, यमक, वीप्सा

अर्थालंकार – उपमा, रूपक, अतिशयोक्ति, विभावना।

(केवल लक्षण एवं उदाहरण अपेक्षित)

प्रश्नपत्र का स्वरूप एवं अंक विभाजन		अंक 40
प्रश्न 1	पूरे पाठ्यक्रम पर दस बहुविकल्पी प्रश्न	10
प्रश्न 2	इकाई 2 पर लघुत्तरी प्रश्न (3 में से 2)	10
प्रश्न 3	इकाई 4 पर टिप्पणियां (3 में से 2)	10
प्रश्न 4	इकाई 1 और 3 पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)	10

सत्र–VI प्रश्नपत्र–XIII

साहित्यशास्त्र और हिंदी आलोचना

DSE-E132

इकाई 1 महाकाव्य – स्वरूप, भारतीय तत्व।

प्रगीत – स्वरूप, भेद।

गजल – स्वरूप, प्रमुख अंग।

इकाई 2 एकांकी – स्वरूप एवं तत्व।

कहानी – स्वरूप एवं तत्व।

उपन्यास – स्वरूप एवं तत्व।

इकाई 3 रेखाचित्र – स्वरूप एवं विशेषताएँ ।

आत्मकथा – स्वरूप एवं विशेषताएँ ।

यात्रावृत्त – स्वरूप एवं विशेषताएँ ।

इकाई 4 आलोचना का स्वरूप।

आलोचक के गुण।

आलोचना के प्रकार –

1) व्याख्यात्मक आलोचना।

2) तुलनात्मक आलोचना।

3) मनोवैज्ञानिक आलोचना।

4) ऐतिहासिक आलोचना.

प्रश्नपत्र का स्वरूप एवं अंक विभाजन		अंक 40
प्रश्न 1	पूरे पाठ्यक्रम पर दस बहुविकल्पी प्रश्न	10
प्रश्न 2	इकाई 2 पर लघुत्तरी प्रश्न (3 में से 2)	10
प्रश्न 3	इकाई 4 पर टिप्पणियां (3 में से 2)	10
प्रश्न 4	इकाई 1 और 3 पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)	10

संदर्भ ग्रंथ सूची

1) काव्यशास्त्र – भगीरथ मिश्र।

2) शास्त्रीय समीक्षा के सिद्धांत – डॉ.गोविंद त्रिगुणायत।

3) काव्य के रूप – बाबू गुलाबराय ।

4) भारतीय काव्यशास्त्र के सिद्धांत – डॉ.कृष्णदेव झारी।

5) भारतीय काव्यशास्त्र – डॉ.मानवेंद्र पाठक।

6) भारतीय साहित्यशास्त्र – डॉ. बलदेव उपाध्याय ।

7) साहित्यशास्त्र – डॉ. चंद्रभान सोनवणे।

8) भारतीय काव्यशास्त्र –डॉ.योगेंद्र प्रताप सिंह।

9) हिंदी आलोचना के बीज शब्द – डॉ. बच्चन सिंह।

10) पाश्चात्य साहित्य सिद्धांत विवेचन – डॉ.ओमप्रकाश शर्मा, शैलजा
    प्रकाशन, यशोदानगर, कानपुर–208011 ।

11) भारतीय एवं पाश्चात्य काव्यशास्त्र – डॉ.त्रिलोकनाथ श्रीवास्तव ,डॉ.गंगासहाय
    प्रेमी, साहित्य सरोवर प्रकाशन, जयपुर हाऊस, आगरा–282010।

शिवाजी विश्वविद्यालय, कोल्हापुर

हिंदी अध्ययन मंडल

जून 2020 से लागू

हिंदी स्पेशल बी.ए.–3 (कला)

सत्र V प्रश्नपत्र IX

हिंदी साहित्य का इतिहास

Discipline Specific Elective (D.S.E.-E8)

(शैक्षिक वर्ष –2020 –21, 2021–22, 2022–23)

प्रस्तुत पाठ्यक्रम का निर्माण विश्वविद्यालय अनुदान आयोग, नई दिल्ली की मॉडल पाठ्यचर्या (CBCS) के आलोक में किया गया है।

उद्देश्य :

1. हिंदी भाषा तथा साहित्य की विकास यात्रा से अवगत कराना।

2. हिंदी साहित्य की विकास यात्रा में हिंदी भाषा के माध्यम से अलग–अलग विचारधारा और प्रवृत्तियों से अवगत कराना।

3. छात्रों में साहित्य समझने तथा उसका आस्वादन, मूल्यांकन करने की दृष्टि को बढाना।

4. छात्रों को साहित्य के संदर्भ में विभिन्न साहित्यिक विधाओं के विकास क्रम से परिचित कराना।

5. छात्रों को युगीन सामाजिक, राजनीतिक परिस्थितियों के परिप्रेक्ष्य में हिंदी से अवगत कराना।

6. इतिहासकारों द्वारा प्रस्तुत काल विभाजन और नामकरण को जानने के लिए प्रेरित करना।

7. हिंदी के प्रमुख संत कवि, उनकी रचनाएँ और उनका समाजसुधार में योगदान से परिचित कराना।

8. हिंदी साहित्य के अंतर्गत गद्य–पद्य विधा और उसके भेदों, उपभेदों से अवगत कराना।

9. आदिकाल से लेकर आधुनिक काल तक के संत, महात्मा, लेखक, कवियों की विचारधारा और उनके द्वारा निर्मित साहित्य का सामान्य परिचय कराना।

अध्यापन पद्धति

- स्वाध्याय .
- व्याख्यान, विवेचन तथा विश्लेषण ।
- संगोष्ठी तथा समूह चर्चा का आयोजन।
- अतिथियों एवं विद्वानों के व्याख्यान।
- दृक श्राव्य माध्यमों का प्रयोग।
- संगणक तथा इंटरनेट आदि साधनों का प्रयोग।

अध्ययनार्थ विषय –

इकाई – 1 आदिकाल –

1. आदिकाल का नामकरण।

2. सामाजिक और राजनीतिक परिस्थितियाँ।

3. आदिकाल की प्रतिनिधि रचनाएँः सामान्य परिचय –

अ) पृथ्वीराज रासो।

आ) बीसलदेव रासो।

इकाई – 2 . भक्तिकाल–

1. भक्तिकालीन सामाजिक परिस्थितियाँ।

2. भक्तिकालीन राजनीतिक परिस्थितियाँ।

3. भक्तिकालीन कवियों का सामान्य परिचय–

अ) संत नामदेव

आ) संत रविदास

इ) संत मीराबाई

ई) गुरू नानक

इकाई – 3 . निर्गुण भक्ति धारा–

1. निर्गुण भक्ति धारा काव्य की सामान्य विशेषताएँ।

2. कबीर : जीवन परिचय एवं कृतित्व।

3. जायसी : जीवन परिचय एवं कृतित्व।

इकाई – 4 . सगुण भक्ति धारा–

1. सगुण भक्ति धारा काव्य की विशेषताएँ ।

2. तुलसीदास : जीवन परिचय एवं कृतित्व।

3. सूरदास : जीवन परिचय एवं कृतित्व।

प्रश्नपत्र का स्वरूप एवं अंक विभाजन		अंक 40
प्रश्न 1	पुरे पाठ्यक्रम पर दस बहुविकल्पी प्रश्न।	10
प्रश्न 2	इकाई 1 पर लघुत्तरीय प्रश्न (3 में से 2)।	10
प्रश्न 3	इकाई 2 पर टिप्पणियाँ (3 मे 2) ।	10
प्रश्न 4	इकाई 3 और 4 पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)।	10

हिंदी साहित्य का इतिहास

DSE-E133

इकाई – 1 रीतिकाल –

1. रीतिकाल का नामकरण।

2. सामाजिक एवं राजनीतिक परिस्थितियाँ।

3. प्रतिनिधि कवियों का सामान्य परिचय –

अ) केशवदास

आ) बिहारी

इ) भूषण

ई) धनानंद।

इकाई – 2 आधुनिक काल –

1. प्रारंभिक हिंदी गद्य साहित्य का सामान्य परिचय ।

2. आधुनिककालीन सामाजिक एवं राजनीतिक परिस्थितियाँ।

3. युग प्रवर्तक साहित्यकार–

अ) भारतेंदु हरिश्चंद्र

आ) जयशंकर प्रसाद

इ) मोहन राकेश

इकाई – 3 आधुनिक गद्य विधाओं का विकास–

1. हिंदी उपन्यास साहित्य उद्भव और विकास।

2. हिंदी नाटक साहित्य उद्भव और विकास।

3. हिंदी यात्रा साहित्य उद्भव और विकास।

इकाई – 4 हिंदी काव्य की विभिन्न धारा और उनकी विशेषताएँ ।

1. छायावाद।

2. प्रगतिवाद

3. समकालीन कविता।

प्रश्नपत्र का स्वरूप एवं अंक विभाजन		अंक 40
प्रश्न 1	पुरे पाठ्यक्रम पर दस बहुविकल्पी प्रश्न	10
प्रश्न 2	इकाई 1 पर लघुत्तरीय प्रशन (3 में से 2)	10
प्रश्न 3	इकाई 2 पर टिप्पणियाँ (3 में 2)	10
प्रश्न 4	इकाई 3 और 4 पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)	10

संदर्भ ग्रंथ सूची –

1. हिंदी साहित्य का इतिहास– आचार्य रामचंद्र शुक्ल, जयभारती प्रकाशन, माया प्रेस रोड, इलाहाबाद।

2. हिंदी साहित्य का इतिहास– डॉ. नगेंद्र, नेशनल पब्लिशिंग हाउस, नई दिल्ली।

3. हिंदी साहित्य का दूसरा इतिहास– डॉ. बच्चन सिंह, राधाकृष्ण प्रकाशन, नई दिल्ली।

4. हिंदी साहित्य की भूमिका, डॉ. हजारीप्रसाद द्विवेदी।

5. हिंदी साहित्य का सही इतिहास– डॉ.चंद्रभानु सोनावने।

6. हिंदी साहित्यः युग और प्रवृत्तियाँ– डॉ.शिवकुमार शर्मा, अशोक प्रकाशन, दिल्ली।

7. हिंदी साहित्य का वैज्ञानिक इतिहास– गणपतिचंद्र गुप्त।

8. मध्यकालीन कवि और कविता– रतन कुमार पाण्डेय, अनभै प्रकाशन, मुंबई।

9. हिंदी साहित्य का इतिहास– डॉ.पूरनचंद टंडन, जगतराम एंड सन्स, नई दिल्ली।

10. भक्तिकाल के कालजई रचनाकार–विष्णु दास वैष्णव, कमला प्रकाशन– डीसा गुजरात।

11. हिंदी साहित्य का इतिहास : नए विचार नई दृष्टि– डॉ. सुरेशकुमार जैन, वाणी प्रकाशन, नई दिल्ली।

12. सूरदास : एक पुनरावलोकन, डॉ. ओमप्रकाश शर्मा, निराली प्रकाशन, पुणे।

13. हिंदी साहित्य का इतिहास– डॉ.गंगासहाय प्रेमी, डॉ.अशोक तिवारी, साहित्य सरोवर प्रकाशन, जयपुर हाऊस, आगरा।

14. संत कबीर व्यक्तित्व एवं रचनाएं–डॉ.मो.मजिद मिया, जीएस पब्लिशर्स डिस्टीब्यूटर्स, शाहदरा– दिल्ली।

15. षटकवि : विवेचनात्मक अध्ययन– खण्ड : 1 और 2, डॉ. ओमप्रकाश शर्मा, निराली प्रकाशन, 1312, शिवाजीनगर, जे.एम.रोड, पुणे– 05।

शिवाजी विश्वविद्यालय, कोल्हापुर

हिंदी अध्ययन मंडल

जून 2020 से लागू

हिंदी स्पेशल बी.ए.–3 (कला)

सत्र–V प्रश्नपत्र–X

प्रयोजनमूलक हिंदी

Discipline Specific Elective (D.S.E.-E9)

(शैक्षिक वर्ष –2020 –21, 2021–22, 2022–23)

प्रस्तुत पाठ्यक्रम का निर्माण विश्वविद्यालय अनुदान आयोग, नई दिल्ली की मॉडल पाठ्यचर्या (CBCS) के आलोक में किया गया है।

उद्देश्य :

1.हिंदी में कार्य करने की रूचि विकसित करना।

2.रोजगार उन्मुख शिक्षा एवं कौशल्य प्रदान करना।

3.पारिभाषिक शब्दावली से परिचित करना।

4.सरकारी पत्राचार के स्वरूप का परिचय कराना।

5.जनसंचार एवं इलेक्ट्रॉनिक माध्यमों से परिचय कराना।

6. अनुवाद स्वरूप, महत्व तथा उपयोगिता से परिचित कराना।

7. रोजगार परक हिंदी की उपयोगिता स्पष्ट कराना।

अध्यापन पद्धति

- स्वाध्याय .

- व्याख्यान, विवेचन तथा विश्लेषण

- संगोष्ठी तथा समूह चर्चा का आयोजन।

- अतिथियों एवं विद्वानों के व्याख्यान।

- दृक श्राव्य माध्यमों का प्रयोग।

- संगणक तथा इंटरनेट आदि साधनों का प्रयोग।

अध्ययनार्थ विषय –

इकाई – 1पारिभाषिक शब्दावली।

दैनिक व्यवहार में प्रयुक्त अंग्रेजी शब्दों के हिंदी पर्यायवाची रूप । (परिशिष्ट में दिए हुए 'अ' तथा 'ब' विभाग के 50 शब्द)।

इकाई –2 सरकारी कार्यालयीन पत्राचार।

1. कार्यालय ज्ञापन।

2. परिपत्र।

3. कार्यालय आदेश।

4. सूचना।

5. अनुस्मारक पत्र।

इकाई –3 हिंदी भाषा और रोजगार के अवसर।

1. रेडियो में रोजगार।

2. विज्ञापन में रोजगार।

3. अनुवाद में रोजगार।

4. पत्रकारिता में रोजगार।

5. फिल्म में रोजगार।

इकाई –4समाचार लेखन।

1. महाविद्यालयीन समारोह का समाचार लेखन।

2. सामाजिक समारोह का समाचार लेखन।

3. प्राकृतिक आपदाओं का समाचार लेखन।

4. दुर्घटनाओं का समाचार लेखन।

प्रश्नपत्र का स्वरूप एवं अंक विभाजन		अंक 40
प्रश्न 1	पारिभाषिक शब्दावली पर दस वस्तुनिष्ठ प्रश्न	10
प्रश्न 2	इकाई 2 पर लघुत्तरीय प्रशन (3 में से 2)।	10
प्रश्न 3	इकाई 3 पर टिप्पणियाँ (3 मे 2) ।	10
प्रश्न 4	इकाई 4 पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)।	10

परिशिष्ट (अ)

पारिभाषिक शब्दावली

	जनसंचार माध्यम संबंधी शब्द	
1.	Announcer	निवेदक
2.	Artistic	कलात्मक
3.	Audio-Visual	दृक–श्राव्य
4.	Banner	पताका
5.	Biographer	जीवनीकार
6.	Biweekly	अर्धसाप्ताहिक
7.	Bulletin	विज्ञप्ति
8.	Catalogue	सूची
9.	Calligraphy	सुलेखन
10.	Caption	शीर्षक /चित्र परिचय
11.	Cartoonist	व्यंग्य चित्रकार
12.	Choreography	नृत्य रचना
13.	Columnist	स्तंभलेखक
14.	Commentator	समालोचक
15.	Compositer	अक्षर योजक
16.	Communication	संचार
17.	Creation	सृजन
18.	Correspondent	संवाददाता
19.	Information Technology	सूचना तंत्रज्ञान
20.	Interview	साक्षात्कार
21.	Interruption	रूकावट
22.	Journalist	पत्रकार
23.	Magazine	पत्रिका
24.	Source Language	स्रोत भाषा
25.	Transliteration	लिप्यंतरण

परिशिष्ट (ब)

शिक्षा सभा और संमेलन संबंधी शब्द

1.	Abstract	सार संक्षेप
2.	Academic Goal	शैक्षिक ध्येय
3.	Address	अभिभाषण संबोधन
4.	Adult Education	प्रौढ शिक्षा
5.	Agenda	कार्यसूची
6.	Anniversary	जयंती वर्षगाँठ
7.	Anthology	संकलन /संग्रह
8.	Appraisal	मूल्यांकन
9.	Attestation	साक्षांकन /अनुप्रमाणन
10.	Audiance	श्रोतागण
11.	Autonomous	स्वायत्त
12.	Bibliography	संदर्भ ग्रंथ सूची
13.	Bachelor	स्नातक
14.	Closing Speech	समापन भाषण
15.	Conference Hall	सम्मेलन भवन
16.	Conclusion	समापन
17.	Document	दस्तावेज
18.	Draft	प्रारूप मसौदा
19.	Guardian	अभिभावक
20.	Humanity	मानविकी
21.	Hypothesis	परिकल्पना
22.	Inauguration	उद्घाटन
23.	Informal	अनौपचारिक
24.	Symposium	संगोष्ठी
25.	Viva-Voce	मौखिक परीक्षा

सत्र–VI प्रश्नपत्र–XV

प्रयोजनमूलक हिंदी

DSE-E134

अध्ययनार्थ विषय –

इकाई –1 पारिभाषिक शब्दावली.

दैनिक व्यवहार में प्रयुक्त अंग्रेजी शब्दों एवं पदनामों के हिंदी पर्यायवाची रूप (परिशिष्ट में दिए हुए 'क' तथा 'ड' विभाग के शब्द एवं पदनाम)

इकाई –2. संदर्भ स्त्रोतों का सामान्य परिचय :

1. इन्स्टाग्राम

2. फेसबुक

3. व्हॉटस्अप

4. ट्विटर

5. ब्लॉग

इकाई–3. जनसंचार इलेक्ट्रॉनिक माध्यमों का सामान्य परिचय :

1. दूरदर्शन

2. इंटरनेट

3. डाक्यूटमेंटरी

4. व्हिडिओ कॉफ्रेंस

5. यु टयूब

इकाई –4 अनुवाद

1. अनुवाद स्वरूप और महत्व ।

2. अनुवाद की उपयोगिता ।

3. प्रकृति के आधार पर अनुवाद के प्रकार ।

4. अनुवादक के गुण।

प्रश्नपत्र का स्वरूप एवं अंक विभाजन		अंक 40
प्रश्न 1	पारिभाषिक शब्दावली पर दस वस्तुनिष्ठ प्रश्न	10
प्रश्न 2	इकाई 2 पर लघुत्तरी प्रश्न (3 में से 2)	10
प्रश्न 3	इकाई 3 पर टिप्पणियाँ (3 में से 2)	10
प्रश्न 4	इकाई 4 पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)	10

संदर्भ ग्रंथ सूची –

1. जनसंचार और पत्रकारिता–विविध आयाम– डॉ.ओमप्रकाश शर्मा, निराली प्रकाशन, पुणे ।

2. मीडिया कालीन हिंदी स्वरूप एवं संभावनाएँ–डॉ. अर्जुन चव्हाण, राधाकृष्ण प्रकाशन नई, दिल्ली।

3. प्रयोजनमूलक हिंदी की नयी भूमिका–डॉ. कैलाशनाथ पाण्डेय, लोकभारती प्रकाशन, इलाहाबाद, नई, दिल्ली।

4. प्रयोजनमूलक हिंदी– डॉ. विनोद गोदरे, वाणी प्रकाशन, नई दिल्ली ।

5. प्रयोजनामूलक हिंदी– विविध परिदृश्य–डॉ.रमेशचंद्र त्रिपाठी, डॉ.पवन अग्रवाल, अलका प्रकाशन, कानपुर।

6. हिंदी भाषा और सूचना प्रौद्योगिकी–डॉ. दीपक रामा तुपे, अभिषेक प्रकाशन, दिल्ली।

7. हिंदी भाषा में रोजगार के अवसर–प्रा.विकास पाटील, ए.बी.एस. पब्लिकेशन वाराणसी।

8. मिडिया में कैरियर– पी.के. आर्य, ग्रंथ अकादमी, नई दिल्ली।

9. प्रयोजनमूलक हिंदी, 'साहित्य सरोवर' –डॉ.श्रीमती आशा मोहन, साहित्य सरोवर प्रकाशन, प्रभु नगर, आगरा–280101

10. मिडिया : एक अंतर्यात्रा– डॉ.स्मिता मिश्र, मंजुली प्रकाशन, नई दिल्ली–23।

परिशिष्ट (क)

	अंग्रेजी के हिंदी वाक्यांश	
1.	Above Mentioned / Said	उपर्युक्त
2.	According to	के अनुसार
3.	After discussion	विचार विवर्श के बाद
4.	Age of retirement	सेवानिवृत्ति की उम्र
5.	As directed	निर्देशानुसार
6.	Effective Control	प्रभावी नियंत्रण
7.	Examine the proposal	प्रस्ताव की जाँच करें
8.	Eligibility is certified	पात्रता प्रमाणित की जाती है
9.	Facilities are not available	सुविधाएँ उपल्बध नहीं है
10.	For Compliance	अनुपालन के लिए
11.	For perusal	अवलोकनार्थ
12.	Gain Wrongfully	अनुचित रूप से प्राप्त करना
13.	Grant of permission	अनुमति देना
14.	Gross negligence	घोर उपेक्षा
15.	Noted and returned	नोट करके वापस किया जाता है
16.	Not in vogue	प्रचलित नहीं हैं
17.	Not satisfactory	संतोषजनक नहीं हैं
18.	Objection is Not valid	आपत्ति वैद्य / मान्य नहीं हैं
19.	On probation	परिवीक्षाधीन
20.	Order was cancelled	आदेश रद्द
21.	Paper under consideration	विचाराधीन पत्र
22.	Passed for payment	भुगतान के लिए पास किया
23.	Pending Cases	प्रलंबित मामले
24.	I agree	मैं सहमत हूँ
25.	In anticipation of	की प्रतीक्षा में

परिशिष्ट (ङ)

	पदनाम संबंधी शब्द	
1.	Adviser	सलाहकार
2.	Accountant	लेखाकार
3.	Advocate	अधिवक्ता
4.	Cashier	रोकडिया / खजाँची
5.	Custodian	अभिरक्षक

6.	Councillor	पार्षद
7.	Director	निदेशक
8.	Executive Engineer	कार्यकारी अभियंता
9.	Foreign secretary	विदेश सचिव
10.	Governor	राज्यपाल
11.	His majesty	महामहिम
12.	Investigater	अन्वेषक
13.	Manager	प्रबंधक
14.	Member of legislative Assembly	विधायक
15.	Member of parliament	सासंद / संसद सदस्य
16.	President	राष्ट्रपति
17.	Prime minister	प्रधानमंत्री
18.	Registrar	कुलसचिव
19.	Speaker	सभापति
20.	Stenographer	आशुलिपिक
21.	Superintendent	अधीक्षक
22.	Treasurer	कोषाध्यक्ष
23.	Under secretary	अवर सचिव
24.	Vice Chancellor	कुलपति
25.	Warden	रक्षक

शिवाजी विश्वविद्यालय, कोल्हापुर

हिंदी अध्ययन मंडल

जून 2020 से लागू

हिंदी स्पेशल बी.ए.–3 (कला)

सत्र–V प्रश्नपत्र–XI
भाषा विज्ञान और हिंदी भाषा

Discipline Specific Elective (D.S.E.-E10)

(शैक्षिक वर्ष –2020 –21, 2021–22, 2022–23)

प्रस्तुत पाठ्यक्रम का निर्माण विश्वविद्यालय अनुदान आयोग, नई दिल्ली की मॉडल पाठ्यचर्या (CBCS) के आलोक में किया गया है।

उद्देश्य :

1) भाषा के विविध रूपों का परिचय कराना ।

2) भाषा विज्ञान का सामान्य परिचय कराना।

3) हिंदी भाषा एवं लिपि के उद्भव और विकास का परिचय कराना ।

4) भाषा की शुद्धता के प्रति छात्रों को जागृत करना ।

5) मानक हिंदी वर्तनी और व्याकरण से छात्रों को परिचित कराना ।

अध्यापन पद्धति

- स्वाध्याय .
- व्याख्यान, विवेचन तथा विश्लेषण
- संगोष्ठी तथा समूह चर्चा का आयोजन।
- अतिथियों एवं विद्वानों के व्याख्यान।
- दृक श्राव्य माध्यमों का प्रयोग।
- संगणक तथा इंटरनेट आदि साधनों का प्रयोग।

अध्ययनार्थ विषय –

इकाई 1– भाषा की परिभाषाएँ, भाषा की विशेषताएँ, भाषा की उत्पत्ति एवं

ततसंबंधी विविध वाद–दैवी उत्पत्ति सिद्धांत, धातु सिद्धांत, अनुकरण सिद्धांत,

श्रमपरिहार सिद्धांत, मनोभावाभिव्यंजक सिद्धांत, समन्वित सिद्धांत ।

इकाई 2– भाषा परिवर्तनशीलता के कारण ।

भाषा के विविध रूप– बोली और परिनिष्ठित भाषा ।

बोलियों के बनने के कारण, बोली और भाषा में अंतर ।

इकाई 3– हिंदी भाषा का उद्भव और विकास ।

हिंदी का शब्दसमूह, हिंदी भाषा के विविध रूप–राष्ट्रभाषा, राजभाषा, संपर्क भाषा ।

इकाई 4 – हिंदी की विविध बोलियाँ–अवधी, ब्रज, खडीबोली, भोजपुरी।

लिपि विकास का सामान्य परिचय, देवनागरी लिपि की वैज्ञानिकता ।

प्रश्नपत्र का स्वरूप एवं अंक विभाजन		अंक 40
प्रश्न 1	पुरे पाठ्यक्रम पर दस बहुविकल्पी प्रश्न।	10
प्रश्न 2	इकाई 3पर लघुत्तरीय प्रशन (3 में से 2)।	10
प्रश्न 3	इकाई 4 पर टिप्पणियाँ (3 मे 2) ।	10
प्रश्न 4	इकाई 1 और 2 पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)।	10

भाषा विज्ञान और हिंदी भाषा

DSE-E135

अध्ययनार्थ विषय –

इकाई 1–भाषाविज्ञान की परिभाषाएँ, भाषाविज्ञान के अध्ययन का महत्त्व, भाषाविज्ञान की वैज्ञानिकता ।

इकाई 2 –भाषाविज्ञान के प्रधान अंगो का परिचय–

ध्वनिविज्ञान, पदविज्ञान, शब्दविज्ञान, वाक्यविज्ञान, अर्थविज्ञान ।

इकाई 3 –भाषाविज्ञान का अन्य ज्ञान विज्ञानों से संबंध ।

    1. भाषा विज्ञान और साहित्य 2. भाषाविज्ञान और व्याकरण ।

    3. भाषाविज्ञान और समाजविज्ञान 4. भाषाविज्ञान और मनोविज्ञान ।

    5. भाषाविज्ञान और इतिहास 6. भाषाविज्ञान और भूगोल ।

इकाई 4–कारकों के अर्थ और प्रयोग,पदक्रम, विरामचिह्न (केवल अल्पविराम, निर्देशक चिन्ह(डैश) और अवतरणचिह्न) मानक वर्तनी के नियम ।

प्रश्नपत्र का स्वरूप एवं अंक विभाजन		अंक 40
प्रश्न 1	पुरे पाठ्यक्रम पर दस बहुविकल्पी प्रश्न।	10
प्रश्न 2	इकाई 4 पर लघुत्तरीय प्रशन (3 में से 2)।	10
प्रश्न 3	इकाई 2 पर टिप्पणियाँ (3 मे 2) ।	10
प्रश्न 4	इकाई 1 और 3 पर दीर्घोत्तरी प्रश्न (अंतर्गत विकल्प के साथ)।	10

संदर्भ ग्रंथ सूची

1. भाषाविज्ञान – डॉ.भोलानाथ तिवारी ।

2. भाषाविज्ञान की भूमिका– डॉ.देवेंदनाथ शर्मा ।

3. भाषाविज्ञान के तत्व– डॉ राजनारायण मौर्य ।

4. भाषाविज्ञान और हिंदी भाषा – डॉ. सुधीर कलावडे ।

5. भाषाविज्ञान के सिद्धांत और हिंदी भाषा – डॉ. द्वारकाप्रसाद सक्सेना ।

6. संक्षिप्त भाषाविज्ञान– डॉ.सुरेशचंद्र त्रिवेदी ।

7. हिंदी– उद्भव विकास और रूप – डॉ.हरदेव बिहारी ।

8. हिंदी भाषा – डॉ.धीरेंद्र वर्मा ।

9. हिंदी भाषा की विकास यात्रा – डॉ.रामप्रकाश ।

10. हिंदी भाषा, व्याकरण लिपि विज्ञान – डॉ.हरदान हर्ष ।

11. हिंदी व्याकरण – कामताप्रसाद गुरू ।

12. नागरी लिपि और उसकी समस्याएँ – डॉ.नरेंद मिश्र ।

13. हिंदी की वर्तनी– कैलासचंद्र भाटिया, रचना भाटिया ।

14. मानक हिंदी का शुद्धिपरक व्याकरण – डॉ.रमेशचंद्र मेहरोत्रा ।

15. भाषाविज्ञान के सिद्धांत – डॉ.ओमप्रकाश शर्मा निराली, प्रकाशन, पुणे– 05।

16.भाषा विज्ञान एवं हिंदी भाषा–डॉ.गंगासहाय प्रेमी,डॉ.त्रिलोकनाथ श्रीवास्तव ,साहित्य सरोवर प्रकाशन, प्रभु नगर, आगरा–01 ।

शिवाजी विश्वविद्यालय, कोल्हापुर

हिंदी अध्ययन मंडल

जून 2020 से लागू

हिंदी स्पेशल बी.ए.–3 (कला)

सत्र–V ,VI

Discipline Specific Elective

(शैक्षिक वर्ष –2020–21, 2021–22, 2022–23)

प्रस्तुत पाठ्यक्रम का निर्माण विश्वविद्यालय अनुदान आयोग, नई दिल्ली की मॉडल पाठ्यचर्या (**CBCS**) के आलोक में किया गया है।

समकक्षता

अ.क्र	पुराना प्रश्नपत्र	अ.क्र	नया प्रश्नपत्र
1	प्रश्नपत्र क्रमांक : 7	1	प्रश्नपत्र क्रमांक : 7
	प्रश्नपत्र क्रमांक : 12		प्रश्नपत्र क्रमांक : 12
2	प्रश्नपत्र क्रमांक : 8	2	प्रश्नपत्र क्रमांक : 8
	प्रश्नपत्र क्रमांक : 13		प्रश्नपत्र क्रमांक : 13
3	प्रश्नपत्र क्रमांक : 9	3	प्रश्नपत्र क्रमांक : 9
	प्रश्नपत्र क्रमांक : 14		प्रश्नपत्र क्रमांक : 14
4	प्रश्नपत्र क्रमांक : 10	4	प्रश्नपत्र क्रमांक : 10
	प्रश्नपत्र क्रमांक : 15		प्रश्नपत्र क्रमांक : 15
5	प्रश्नपत्र क्रमांक : 11	5	प्रश्नपत्र क्रमांक : 11
	प्रश्नपत्र क्रमांक : 16		प्रश्नपत्र क्रमांक : 16

SHIVAJI UNIVERSITY, KOLHAPUR

Revised syllabus for
Bachelor of Arts (Part – III)

SEMESTERV & VI

ECONOMICS

Syllabus to be implemented from June 2020 onwards

Equivalance B.A.III Economics Sem- V

Sem No.	Paper No.	Title of Old Paper	Sem No.	Discipline	Title of New Paper
V	VII	Micro Economics	V	Economics Course - 7	Principles of Micro Economics- I
V	VIII	Research Methodology in Economics (Part I)	V	Economics Course- 10	Research Methodology in Economics- I
V	IX	History of Economic Thoughts (Part I)	V	Economics Course - 11	History of Economic Thoughts- I
V	X	Economics of Development	V	Economics Course - 8	Economics of Development
V	XI	International Economics (Part I)	V	Economics Course - 9	International Economics- I

Equivalance B.A.III Economics Sem- VI

Sem No.	Paper No.	Title of Old Paper	Sem No.	Economics Course	Title of New Paper
VI	XII	Market and Pricing	VI	Economics Course- 12	Principles of Micro Economics- II
VI	XIII	Research Methodology in Economics (Part II)	VI	Economics Course- 15	Research Methodology in Economics- II
VI	XIV	History of Economic Thoughts (Part II)	VI	Economics Course- 16	History of Economic Thoughts- II
VI	XV	Economics of Planning	VI	Economics Course- 13	Economics of Planning
VI	XVI	International Economics (Part II)	VI	Economics Course- 14	International Economics- II

Structure of Course
Revised syllabus of B.A. Part III (Economics)

Sr. No.	Semester	Title of the Paper	Discipline	Distribution of Credit	Workload	Total Credits	Theory Marks	Term work seminar
1	V	Principles of Micro Economics- I	Economics Course- 7	4	4 Lectures / week	20	40	10
2	V	Economics of Development	Economics Course- 8	4	4 Lectures / week		40	10
3	V	International Economics- I	Economics Course- 9	4	4 Lectures / week		40	10
4	V	Research Methodology in Economics- I	Economics Course- 10	4	4 Lectures / week		40	10
5	V	History of Economic Thoughts- I	Economics Course- 11	4	4 Lectures / week		40	10

Sr. No.	Semester	Title of the Paper	Discipline	Distribution of Credit	Workload	Total Credits	Theory Marks	Term work Group Project
6	VI	Principles of Micro Economics- II	Economics Course- 12	4	4 Lectures / week	20	40	10
7	VI	Economics of Planning	Economics Course- 13	4	4 Lectures / week		40	10
8	VI	International Economics- II	Economics Course- 14	4	4 Lectures / week		40	10
9	VI	Research Methodology in Economics- II	Economics Course- 15	4	4 Lectures / week		40	10
10	VI	History of Economic Thoughts- II	Economics Course- 16	4	4 Lectures / week		40	10

B. A. III Economics (Semester V) (CBCS Pattern)

Principles of Micro Economics- I
(Elective Course- 7) DSE E-71

Course Outcomes: After successful completion of this course, the students will be able to:

- Explain what economics is and explain why it is important
- Understand consumer decision making and consumer behaviour
- Define the concept of utility and satisfaction
- Derive revenue and cost figures as well as curves
- Understand producer decision making and producer behaviour

Module- I Introduction to Micro Economics   **(Teaching Hours- 15, Credits- 01)**

     1.1   Meaning, nature and scope

     1.2   Importance and limitations

     1.3   The Economic Problem- Scarcity and Choice; concept of
            opportunity cost

     1.4   Framework of economic analysis- Concept, module, parameters

Module- II Consumer's Behaviour   **(Teaching Hours- 15, Credits- 01)**

     2.1   Utility- concept, total and marginal utility

     2.2   Cardinal utility approach: law of diminishing marginal utility

     2.3   Ordinal utility approach: meaning and properties of indifference curve

     2.4   Consumer's equilibrium and consumer's surplus

Module- III Demand and Supply Analysis   **(Teaching Hours- 15, Credits- 01)**

     3.1   Law of demand, demand function, determinants of demand

     3.2   Elasticity of demand: price, income, cross and substitution

     3.3   Measurement and importance

     3.4   Law of supply, supply function and elasticity

Module- IV Theory of Production   **(Teaching Hours- 15, Credits- 01)**

     4.1   Law of variable proportions and law of returns to scale

     4.2   Economies and diseconomies of scale

     4.3   Revenue- total, marginal and average revenue

     4.4   Cost concepts and their relationship, cost curves- short run and long run

BASIC READING LIST:

1.   Dominic Salvator (2012) – Principles of Micro Economics, 5th edition, Oxford University Press, Oxford.
2.   John B. Taylor & Akila Weerapana, (2011) 'Principles of Economics', 7th Edition, Cengage Learning, India, New Delhi.

3. Koutsoyiannis, A. (1979), Modern Microeconomics, 2nd Edition, Macmillan Press, London.

4. Lipsey Richard G., (latest edition), An Introduction to Positive Economics, Weidenfeld & Nicolson, London.

5. Lipsey, R.G. and K.A. Chrystal (latest edition), Principles of Economics (IX Ed.), Oxford University Press, Oxford.

6. Mankiw, N. Gregory (2008),Principles of Microeconomics, 5th Edition, Cengage Learning India, New Delhi.

7. Mansfield, E (latest edition), Microeconomics (9th Ed) W.W. Norton and Company, New York.

8. Pindyek and Rubinfield (latest edition)- Micro Economics, Pearson Education, New Delhi.

9. Ray, N.C. (latest edition), An introduction to Microeconomics, Macmillan company of India Ltd.

10. Samuelson, P.A. and W.D. Nordaus (latest edition), Economics, Tata McGraw Hill, New Delhi.

11. Stonier, A.W. and D.C. Hague (latest edition), A Textbook of Economic Theory, ELBS and Logman Group, London.

12. Varian, Hall (1992): Microeconomic Analysis, Third Edition, W. W. Norton & Company, Inc, New York.

B. A. III Economics (Semester V) (CBCS Pattern)
Economics of Development
(Elective Course- 8) DSE – E - 72

Course Outcomes: After successful completion of this course, the students will be able to:

- Identify the dimensions of development
- Distinguish the fundamental and contemporary development debate
- Know the theories of economic development
- Realise the role of state in economic development

Module- I: Basic concepts of economic development   **(Teaching Hours- 15, Credits- 01)**

1.1   Meaning of economic development- Distinction between economic development and growth
1.2   Indicators of economic development
1.3   Obstacles to economic development
1.4   Sustainable and green development

Module- II: Developing and developed countries   **(Teaching Hours- 15, Credits- 01)**

2.1   Underdevelopment and characteristics
2.2   Factors affecting economic development
2.3   Features of economic growth
2.4   Developmental status of Indian economy

Module- III: Theories of economic development   **(Teaching Hours- 15, Credits- 01)**

3.1   Classical approach to development- Ricardian Theory
3.2   Myrdal's theory of economic development
3.3   Rostow's stages of economic growth
3.4   Theory of balanced and unbalanced growth

Module- IV: Resources for economic development   **(Teaching Hours- 15, Credits- 01)**

4.1   Capital formation, Technology and economic development
4.2   Human capital and economic development
4.3   FDI, FIIs, Portfolio and Aid
4.4   Role of state in economic development

BASIC READING LIST:

1. Adelman, Irma (1962), *Theories of Economic Growth and Development*, Stanford University Press, Stanford.
2. Behrman, S. and T.N. Srinivasan (1995), *Handbook of Development Economics*, Vol. 1to 3, Elsevire, Amsterdam. Economics 31
3. Ghatak, Subrata (1986), *Introduction to Development Economics*, Allen and Unwin, London.
4. Hayami, Yujiro and Yoshihisa Godo (1997), *Development Economics*, Oxford University Press, New York.
5. Higgins, Benjamin (1980), *Economic Development*, Norton, New York.

6. Kindleberger, C.P. (1965), *Economic Development*, 3e, McGraw Hill, New York.
7. Meier, Gerald M. and James E. Rauch (2005), *Leading Issues in Economic Development*, 6e, Oxford University Press, New Delhi.
8. Myint, Hla (1965), *The Economics of Underdeveloped Countries*, Preager, New York.
9. Myint, Hla (1971), *Economic Theory and Under Developed Countries*, Oxford University Press, New York.
10. Thirlwal, A.P. (1999), (6th Edition), *Growth and Development*, Macmillan, London.
11. Bhagwati, J. and P. Desai (1970), *India : Planning for Industrialization*, Oxford University Press, London.
12. Boserup, Ester (1981), *Population and Technological Change : A Study of Long Term Change*, Chicago University Press, Chicago.
13. Brahmananda, P.R. and C.N. Vakil (1956), *Planning for an Expanding Economy,* Vora and Co., Bombay.
14. Puri V. K. And S. K. Misra (2016), *Economics of Development and Planning*, Himalaya Publishing House.
15. Datta Gaurav and Ashwini Mahajan (2016), *Indian Economy*, S. Chand Publishing, New Delhi
16. Todaro Michael P. And Stephen C. Smith (2017), *Economic Development,* Pearson Education.
17. Chakravarti, Sukhamoy (1982), *Alternative Approaches to the Theory of Economic Growth,* Oxford University Press, Delhi.
18. Chakravarty, Sukhamoy (1987), *Development Planning : The Indian Experience,* Clarendon Press, Oxford.
19. Jhingan, M.L. (2005) *The Economics of Development and Planning* , Vrinda Publications Ltd. Delhi
20. Lekhi, R.K. (2005) *Economics of Development and Planning*, Kalyani Publishers, Delhi.
21. Patil, J. F. (et al) (2005) *Economics of Growth and Development* (Marathi) , Phadake Publishers, Kolhapur.
22. Patil, J.F. & Tamhankar, P.J. (1990) *Economics of Development and Planning* (Marathi), Continental Publishers, Pune.
23. Kavimandan (1975), *Economics of Development and Planning* (Marathi), Mangesh Prakashan , Nagpur

B. A. III Economics (Semester V) (CBCS Pattern)
International Economics- I
(Elective Course- 9) DSE – E 73

Course Outcomes: After successful completion of this course, the students will be able to:

- Explain international trade
- Understand the measurement of gains from international trade
- Distinguish different rates of exchange
- Measure the terms of trade

Module- I: Trade and Trade Theories　　　　　**(Teaching Hours- 15, Credits- 01)**

　　1.1　　Importance of the study of International Economics

　　1.2　　Inter-regional and international trade: similarities and dissimilarities.

　　1.3　　Ricardian theory of international trade

　　1.4　　Hecksher – Ohlin Theory

Module- II: Gains from International Trade　　　**(Teaching Hours- 15, Credits- 01)**

　　2.1　　Gains from international trade and their measurement

　　2.2　　Trade as an engine of economic growth.

　　2.3　　Terms of trade: meaning, concepts and application

　　2.4　　Factors affecting terms of trade

Module- III: Exchange Rate　　　　　　　　　**(Teaching Hours- 15, Credits- 01)**

　　3.1　　Meaning of exchange rate, Purchasing Power Parity theory

　　3.2　　Fixed Exchange Rate – meaning, merits and demerits

　　3.3　　Flexible Exchange Rate – meaning, merits and demerits

　　3.4　　Floating Exchange Rate – meaning, merits and demerits

Module- IV: Tariffs and Quotas　　　　　　　**(Teaching Hours- 15, Credits- 01)**

　　4.1　　Free Trade: meaning, arguments for and against

　　4.2　　Trade Protection Policy: meaning, arguments for and against.

　　4.3　　Tariffs:meaning, types and effects

　　4.4　　Quotas:meaning, types and effects.

BASIC READING LIST:

1　　Aggarwal, M. R. (1979), Regional Economic Cooperation in South Asia, S. Chand and Co., New Delhi.
2　　Bhagwati, J. (Ed.) (1981), International Trade, Selected Readings, Cambridge University Press, Mass.
3　　Crockett. A. (1982), International Money: Issue and Analysis, ELBS and Nelson, London.

4   Greenaway. D. (1983), International Trade Policy, MacMillan Publishers Ltd., London.

5   Heller, H. R. (1968), International Monetary Economics, Prentice Hall. India.

6   Joshi V. and I.M.D. Little (1998), India's Economic Reforms, 1999-2001, Oxford

7   Kenan, P.B. (1994), The International Economy, Cambridge University Press, London.

8   Kindlberger, C. P. (1973), International Economics, R.D. Irwin, Homewood.

9   Krugman, P. R. and M. Obstgeld (1994), International Economics: Theory and Policy, Glenview, Foresman.

10   Mithani D.M. (Reprint-2009) International Economics, Himalaya Publishing House, New Delhi.

11   Nayyar,D. (1976) : India's Exports and Export Policies in the 1960s, Cambridge University Press, Cambridge.

12   Panchmukhi, V. R. (1978), Trade Policies of India: A Quantitative Analysis, Concept University Press, Delhi.

13   Patel, S. J. (1995), Indian Economy Towards the 21st Century, University Press Ltd., India.

14   RuddarDatt& K.P.M. Sundaram, (2018), Indian Economy, S. Chand & Co. Ltd., New Delhi

15   Salvatore, D. L. (1997), International Economics, Prentice- Hall, Upper Saddle River, N. J.

16   Singh, M. (1964), India Export Trends and the Prospects for Self-sustained Growth, Oxford University Press, Oxford.

17   Sodersten, Bo (1991), International Economics, MacMillan Press Ltd. London

B. A. III Economics (Semester V) (CBCS Pattern)

Research Methodology in Economics- I
(Elective Course- 10) DSE – E 74

Course Outcomes: After successful completion of this course, the students will be able to:

- Get acquainted with the basic concepts of research and its methodologies.
- Select and define appropriate research problem and parameters.

Module- I: Introduction to research in economics (Teaching Hours- 15, Credits- 01)

    1.1   Meaning, definitions and objectives of research

    1.2   Types of research

    1.3   Significance of research

    1.4   Areas of economic research

Module- II: Literature review and research design   (Teaching Hours- 15, Credits- 01)

    2.1   Literature review- meaning, need, how to carry out a literature review?

    2.2   Research design- steps in research design

    2.3   Features of good research design

    2.4   Importance of research design

Module- III: Hypothesis and concept   (Teaching Hours- 15, Credits- 01)

    3.1   Meaning and definition, kinds of hypothesis

    3.2   Features of hypothesis

    3.3   Importance of hypothesis

    3.4   Concept- meaning, conceptualization, formal and operational definition

        of concept

Module- IV: Data collection   (Teaching Hours- 15, Credits- 01)

    4.1   Primary and secondary data

    4.2 Primary data collection methods- observation, questionnaire, interview

    4.3   Sources of secondary data

    4.4Importance of data collection

BASIC READING LIST:

1.   Goode and Hatt(1981), Methods in Social Research, McGraw Hill International Book Company, New Delhi.
2.   Kerliger F.N.(1983), Foundation of Behavioural Research, Surjeet Publication,Delhi.
3.   Young P. V. (1960), Scientific Social Survey and Research, Asia Publication House,Mumbai.

4. Kothari C.R. (1993), Research Methodology-Methods and Techniques, Wiley Eastern Ltd.,New Delhi.
5. Lundbrg G.A.(1960), Social Research, Longmans Green and Company, New York.
6. Herekar P .M.(2019), Research Methodology and Project Work, Phadake Prakashan,Kolhapur.
7. Settiz Claire,Jahoda Marie and Others(1959), Research Methods in SocialResearch,Dryden New York.
8. Takur Dvendra(1997), Research Methodology in Social Sciences, Deep and Deep Publication,New Delhi.
9. Gupta S.P.and Gupta M.P.(2005), Business Statistics, Sultan Chand & Sons, New Delhi
10. Gupta C.B.(1996), An Introduction to Methods, Vikas Publication House,New Delhi.
11. देशमुख राम (जून 2005) : 'मूलभूत सांख्यिकी', विद्या प्रकाशन, नागपूर.
12. पाटील ज.फा., पठाण के.जी., ताम्हणकर पी.जे., संतोष यादव (2012) : 'अर्थशास्त्रीय संशोधनाची तोंडओळख', (सुधारित आवृत्ती), कॉन्टिनेंटल प्रकाशन, पुणे.
13. आगलावे प्रदीप (जानेवारी 2000) : 'संशोधन पध्दतीशास्त्र व तंत्रे', विद्या प्रकाशन, नागपूर.
14. खैरनार दिलीप (फेब्रुवारी 2009) : 'प्रगत सामाजिक संशोधन पध्दती व सांख्यिकी', डायमंडपब्लिकेशन्स, पुणे.
15. भांडारकर पु.ल. (1987) : 'सामाजिक संशोधन पध्दती', महाराष्ट्र विद्यापीठ ग्रंथनिर्मिती मंडळ, नागपूर.

B. A. III Economics (Semester V) (CBCS Pattern)

History of Economic Thoughts- I
(Elective Course- 11) DSE – E 75

Course Outcomes: After successful completion of this course, the students will be able to:

- Understand the basic economic ideas of various economic thinkers of the world
- Understand the development of economic thoughts

Module-I: Origin of Economic Thoughts   **(Teaching Hours- 15, Credits- 01)**
- 1.1   Early economic thought, rise of mercantilism, features of Mercantilism
- 1.2   Meaning and causes of emergence of Physiocracy
- 1.3   The concept of natural order and primacy of agriculture
- 1.4   Tableau economique

Module- II: Classical Economic Thoughts   **(Teaching Hours- 15, Credits- 01)**
- 2.1   Adam Smith: Division of labour, theory of value and canons of taxation
- 2.2   David Ricardo: Theory of Value and views on distribution
- 2.3   Thomas Malthus: Theory of Population
- 2.4   Theory of Gluts

Module- III: Economic Thoughts of Fredrick List   **(Teaching Hours- 15, Credits- 01)**
- 3.1   Criticism on Classical School
- 3.2   Stages of Economic growth
- 3.3   Concept of Nationalism
- 3.4   Theory of Protectionism

Module- IV: Economic Thoughts of Karl Marx (Teaching Hours- 15, Credits- 01)
- 4.1   The Concept of Scientific Socialism and Meterialist approach
- 4.2   The Theory of Value
- 4.3   Theory of Surplus Value
- 4.4   Concept of Falling rate of profit

BASIC READING LIST:

1. Dandekar V.M.and N.Nath (1971), Poverty in India, Indian school of political Economy, Pune.

2. Ganguli B. N. (1977): Indian Economic Thought - A 19th Century Perspectives,Tata Mc Grow Hill, New Delhi.

3. Rath Nilkanth(1995) V.M.Dandekar Social Scientist with a Difference : Journal of Indian School of Political Economy.Oct-Dec.1995, Vol-7 No-4.

4. Seshadri G.B.(1997): Economic Doctrines, Publishing Corporation, New Delhi.

5. चा.भ.खैरमोडे (१९७८) – डॉ.भीमराव रामजी आंबेडकर, खंड १ ला , खंड २ रा खंड ७ वा, प्रताप प्रकाशन.

6. गांधी मो.क.(१९९७) -मराठी अनुवाद सीताराम पुरोषोत्तम पटवर्धन'सत्याचे प्रयोग अथवा आत्मकथा पाचवी आवृत्ती.

7. डॉ.जे.एफ.पाटील (२०१५)– आर्थिक विचारांचा इतिहास, फडके प्रकाशन, कोल्हापूर.

8. इंगळे बी.डी. (२०११) आर्थिक विचारांचा इतिहास, अरुणा प्रकाशन, लातूर.

9. प्रा.रायखेलकर,डॉ.दामजी (२०११) – आर्थिक विचारांचा इतिहास, विद्या बुक पब्लिशर्स,औरंगाबाद.

10. प्रा.डॉ.अनिलकुमार वावरे, प्रा.संजय धोंडे, व डॉ.अनिल सत्रे (२०१४)– आर्थिक विचारांचा इतिहास, एज्युकेशनल पब्लिशर्स ॲन्ड डिस्ट्रिब्युटर्स,औरंगाबाद.

11. प्रा.रा.म.गोखले - आर्थिक विचारांचा इतिहास

12. डॉ.विजय कविमंडन - आर्थिक विचारांचा इतिहास

B. A. III Economics (Semester VI) (CBCS Pattern)

Principles of Micro Economics- II

(Elective Course- 12) DSE E 196

Course Outcomes: After successful completion of this course, the students will be able to:

- Identify the market structure
- Analyse the economic behaviour of individual firms and markets
- Analyse a firm's profit maximising strategies under different market conditions
- Understand the factor pricing

Module- I Perfect Competition   **(Teaching Hours- 15, Credits- 01)**

 1.1   Meaning and characteristics
 1.2   price and outputdetermination under perfect competition
 1.3   Equilibrium of the firm and industry in the short run
 1.4   Equilibrium of the firm and industry in the long run

Module- II Monopoly   **(Teaching Hours- 15, Credits- 01)**

 2.1   Meaning and characteristics

 2.2   Price discrimination and degrees

 2.3   Equilibrium of a monopoly firm in the short run and long run

 2.4   Monopoly and capacity loss

Module- III Imperfect Competition   **(Teaching Hours- 15, Credits- 01)**

 3.1   Meaning and characteristics

 3.2   Price- output determination

 3.3   Product differentiation

 3.4   Oligopoly and duopoly- meaning and characteristics

Module- IV Factor Pricing   **(Teaching Hours- 15, Credits- 01)**

 4.1   Marginal productivity theory

 4.2   Modern theory of rent

 4.3   Classical and Keynesian theory of interest

 4.4   Risk and uncertainty theory of profit

BASIC READING LIST:

 1.   Dominic Salvator (2012) – Principles of Micro Economics, 5th edition, Oxford University Press, Oxford.
 2.   John B. Taylor & Akila Weerapana, (2011) 'Principles of Economics', 7th Edition, Cengage Learning, India, New Delhi.

3. Koutsoyiannis, A. (1979), Modern Microeconomics, 2nd Edition, Macmillan Press, London.

4. Lipsey Richard G., (latest edition), An Introduction to Positive Economics, Weidenfeld & Nicolson, London.

5. Lipsey, R.G. and K.A. Chrystal (latest edition), Principles of Economics (IX Ed.), Oxford University Press, Oxford.

6. Mankiw, N. Gregory (2008),Principles of Microeconomics, 5th Edition, Cengage Learning India, New Delhi.

7. Mansfield, E (latest edition), Microeconomics (9th Ed) W.W. Norton and Company, New York.

8. Pindyek and Rubinfield (latest edition)- Micro Economics, Pearson Education, New Delhi.

9. Ray, N.C. (latest edition), An introduction to Microeconomics, Macmillan company of India Ltd.

10. Samuelson, P.A. and W.D. Nordaus (latest edition), Economics, Tata McGraw Hill, New Delhi.

11. Stonier, A.W. and D.C. Hague (latest edition), A Textbook of Economic Theory, ELBS and Logman Group, London.

12. Varian, Hall (1992): Microeconomic Analysis, Third Edition, W. W. Norton & Company, Inc, New York.

B. A. III Economics (Semester VI) (CBCS Pattern)
Economics of Planning
(Elective Course- 13) DSE – E 197

Course Outcomes: After successful completion of this course, the students will be able to:

- Get acquainted with economic planning and its importance in development
- Get acquianted with development of planning and planning machinery in India
- Evaluate sectoral performance of the Indian economy
- Compare and analyse Indian models of economic development

Module- I: Introduction to economic planning   (Teaching Hours- 15, Credits- 01)
      1.1   Meaning, Case for and against economic planning
      1.2   Genesis of planning
      1.3   Types of planning
      1.4   Conditions of success of planning

Module- II: Issues in economic planning   (Teaching Hours- 15, Credits- 01)
      2.1   The choice of techniques: labour and capital intensive
      2.2   Capital output ratio: Importance and factors affecting COR
      2.3   Input output analysis
      2.4   Project evaluation

Module- III: Planning in India- I   (Teaching Hours- 15, Credits- 01)
      3.1   Evolution of planning in India
      3.2   Objectives and evaluation of planning
      3.3   Planning Commission and National Development Council
      3.4   NITI Ayog- Need for establishment, organization, objectives and work

Module- IV: Planning in India- II   (Teaching Hours- 15, Credits- 01)
      4.1   Plan models in Indian plans
      4.2   Agricultural development under plans
      4.3   Industrial development under plans
      4.4   Services sector development under plans

BASIC READING LIST:

1. Behrman, S. and T.N. Srinivasan (1995), *Handbook of Development Economics*, Vol. 1to 3, Elsevire, Amsterdam. Economics 31
2. Hayami, Yujiro and Yoshihisa Godo (1997), *Development Economics*, Oxford University Press, New York.
3. Kindleberger, C.P. (1965), *Economic Development*, 3e, McGraw Hill, New York.
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5. Myint, Hla (1971), *Economic Theory and Under Developed Countries*, Oxford University Press, New York.
6. Thirlwal, A.P. (1999), (6th Edition), *Growth and Development*, Macmillan, London.

7. Bhagwati, J. and P. Desai (1970), *India : Planning for Industrialization*, Oxford University Press, London.
8. Brahmananda, P.R. and C.N. Vakil (1956), *Planning for an Expanding Economy,* Vora and Co., Bombay.
9. Puri V. K. And S. K. Misra (2016), *Economics of Development and Planning*, Himalaya Publishing House.
10. Datta Gaurav and Ashwini Mahajan (2016), *Indian Economy*, S. Chand Publishing, New Delhi
11. Chakravarty, Sukhamoy (1987), *Development Planning : The Indian Experience,* Clarendon Press, Oxford.
12. Jhingan, M.L. (2005) *The Economics of Development and Planning* , Vrinda Publications Ltd. Delhi
13. Lekhi, R.K. (2005) *Economics of Development and Planning*, Kalyani Publishers, Delhi.
14. Patil, J. F. (et al) (2005) *Economics of Growth and Development* (Marathi) , Phadake Publishers, Kolhapur.
15. Patil, J.F. & Tamhankar, P.J. (1990) *Economics of Development and Planning* (Marathi), Continental Publishers, Pune.

B. A. III Economics (Semester VI) (CBCS Pattern)

International Economics- II
(Elective Course- 14) DSE – E 198

Course Outcomes: After successful completion of this course, the students will be able to:

- Distinguish between balance of trade and balance of payments
- Analyse the balance of payments
- Understand the various types of foreign capital
- Analyse the impact of international institutions on Indian economy

Module- I: Balance of Trade and Balance of Payments(Teaching Hours- 15, Credits- 01)

    1.1   Balance of Trade and Balance of Payments

    1.2   Importance of Balance of Payments

    1.3   Disequilibrium in Balance of Payments: Causes and Consequences

    1.4   Measures to correct disequilibrium in Balance of Payments

Module- II: Foreign Trade of India since 1991   (Teaching Hours- 15, Credits- 01)

    2.1   Volume, composition and direction

    2.2   Exim Policy of 2014-19

    2.3   Trade administration of India

    2.4   Convertibility of Rupee: Meaning and types.

Module- III: Foreign Capital in India   (Teaching Hours- 15, Credits- 01)

    3.1   Need for Foreign Capital

    3.2   Types of Foreign Capital

    3.3   Foreign Capital Policy of Government of India

    3.4   Trends in Foreign Direct Investment in India

Module- IV: International Institutions and India   (Teaching Hours- 15, Credits- 01)

    4.1   IMF: Objectives and Functions

    4.2   IBRD: Objectives,Functions

    4.3   ADB: Objectives, Functions

    4.4   WTO: Objectives, Functions

BASIC READING LIST:

1   Aggarwal, M. R. (1979), Regional Economic Cooperation in South Asia, S. Chand and Co., New Delhi.

2   Bhagwati, J. (Ed.) (1981), International Trade, Selected Readings, Cambridge University Press, Mass.

3   Crockett. A. (1982), International Money: Issue and Analysis, ELBS and Nelson, London.

4	Greenaway. D. (1983), International Trade Policy, MacMillan Publishers Ltd., London.
5	Heller, H. R. (1968), International Monetary Economics, Prentice Hall. India.
6	Joshi V. and I.M.D. Little (1998), India's Economic Reforms, 1999-2001, Oxford
7	Kenan, P.B. (1994), The International Economy, Cambridge University Press, London.
8	Kindlberger, C. P. (1973), International Economics, R.D. Irwin, Homewood.
9	Krugman, P. R. and M. Obstgeld (1994), International Economics: Theory and Policy, Glenview, Foresman.
10	Mithani D.M. (Reprint-2009) International Economics, Himalaya Publishing House, New Delhi.
11	Nayyar,D. (1976) : India's Exports and Export Policies in the 1960s, Cambridge University Press, Cambridge.
12	Panchmukhi, V. R. (1978), Trade Policies of India: A Quantitative Analysis, Concept University Press, Delhi.
13	Patel, S. J. (1995), Indian Economy Towards the 21st Century, University Press Ltd., India.
14	RuddarDatt& K.P.M. Sundaram, (2018), Indian Economy, S. Chand & Co. Ltd., New Delhi
15	Salvatore, D. L. (1997), International Economics, Prentice- Hall, Upper Saddle River, N. J.
16	Singh, M. (1964), India Export Trends and the Prospects for Self-sustained Growth, Oxford University Press, Oxford.
17	Sodersten, Bo (1991), International Economics, MacMillan Press Ltd. London

B. A. III Economics (Semester VI) (CBCS Pattern)

Research Methodology in Economics- II
(Elective Course- 15) DSE – E - 199

Course Outcomes: After successful completion of this course, the students will be able to:

- Understand the sampling techniques as a method of data collection
- Use techniques of data analysis in research
- Write a research report and thesis
- Write a research proposal (grants)

Module- I: Sampling (Teaching Hours- 15, Credits- 01)

    1.1   Meaning and nature

    1.2   Types of sampling

    1.3   Criteria of good sampling

    1.4   Optimum size of sampling

Module- II: Processing and representation of data   (Teaching Hours- 15, Credits- 01)

    2.1   Classification of data

    2.2   Tabulation of data

    2.3   Percentage

    2.4   Graphs and diagrams

Module- III: Techniques of data analysis   (Teaching Hours- 15, Credits- 01)

    3.1   Need and importance of data analysis

    3.2   Measures of central tendency: mean, mode, median (direct method)

    3.3   Measures of variation: range, standard deviation (direct method)

    3.4   Correlation- meaning and importance, Karl Pearson's coefficient of   correlation

Module- IV: Interpretation of data and report writing(Teaching Hours- 15, Credits- 01)

    4.1   Interpretation of data: meaning

    4.4 Report writing: meaning, steps, precautions

    4.5   Properties of good report writing

    4.4   Writinga good research proposal

BASIC READING LIST:

1. Goode and Hatt (1981), Methods in Social Research, McGraw Hill International Book Company, New Delhi.
2. Kerliger F.N.(1983), Foundation of Behavioural Research, Surjeet Publication,Delhi.
3. Young P. V.(1960), Scientific Social Survey and Research, Asia Publication House,Mumbai.
4. Kothari C.R. (1993), Research Methodology-Methods and Techniques, Wiley Eastern Ltd.,New Delhi.
5. Lundbrg G.A.(1960), Social Research, Longmans Green and Company, New York.
6. Herekar P .M.(2019), Research Methodology and Project Work, Phadake Prakashan,Kolhapur.
7. Settiz Claire,Jahoda Marie and Others(1959), Research Methods in SocialResearch,Dryden New York.
8. Takur Dvendra (1997), Research Methodology in Social Sciences, Deep and Deep Publication,New Delhi.
9. Gupta S.P.and Gupta M.P.(2005), Business Statistics, Sultan Chand & Sons, New Delhi
10. Gupta C.B. (1996), An Introduction to Methods, Vikas Publication House,New Delhi.
11. देशमुख राम (जून 2005) : 'मूलभूत सांख्यिकी', विद्या प्रकाशन, नागपूर.
12. पाटील ज.फा., पठाण के.जी., ताम्हणकर पी.जे., संतोष यादव (2012) : 'अर्थशास्त्रीय संशोधनाची तोंडओळख', (सुधारित आवृत्ती), कॉन्टिनेंटल प्रकाशन, पुणे.
13. आगलावे प्रदीप (जानेवारी 2000) : 'संशोधन पध्दतीशास्त्र व तंत्रे', विद्या प्रकाशन, नागपूर.
14. खैरनार दिलीप (फेब्रुवारी 2009) : 'प्रगत सामाजिक संशोधन पध्दती व सांख्यिकी', डायमंड पब्लिकेशन्स, पुणे.
15. भांडारकर पु.ल. (1987) : 'सामाजिक संशोधन पध्दती', महाराष्ट्र विद्यापीठ ग्रंथनिर्मिती मंडळ, नागपूर.

B. A. III Economics (Semester VI) (CBCS Pattern)

History of Economic Thoughts- II
(Elective Course- 16) DSE – E 200

Course Outcomes: After successful completion of this course, the students will be able to:

- Understand the economic concepts and theories of Neo-Classical and Indian thinkers.
- Understand the development of economic thoughts

Module- I: Neo- Classical Economic Thought – Alfred Marshall

(Teaching Hours- 15, Credits- 01)

1.1   Theory of Value
1.2   The concept of representative firm
1.3   Consumer's surplus, elasticity of demand
1.4   Quasi rent

Module- II: Indian Economic Thought   **(Teaching Hours- 15, Credits- 01)**

2.1   Mahatma Phule: Views on agriculture and education
2.2   Rajarshi Shahu Maharaj: Policy for agriculture development and co- Operation
2.3   Dr. Babasaheb Ambedkar: Views on money, agriculture and development policy
2.4   Dadabhai Nauroji: Drain theory

Module- III: Mahatma Gandhi   **(Teaching Hours- 15, Credits- 01)**

3.1   Concept of village development
3.2   Importance of decentralization
3.3   Basic principle of development: swadeshi
3.4   Concept of Gram Swarajya

Module- IV: Economic Thoughts of Modern Indian Economist

(Teaching Hours- 15, Credits- 01)

4.1   Gopal Krishna Gokhale's views on public finance
4.2   D. R. Gadgil: Views on co-operative development and decentralization of power, co-operative commonwealth
4.3   V. M. Dandekar: Views on poverty
4.4   Amartya Sen: Concept of social choice, choice of techniques, Sen's views on poverty and public action

BASIC READING LIST:

1. Dandekar V.M.and N.Nath (1971), Poverty in India, Indian school of political Economy, Pune.

2. Ganguli B. N. (1977): Indian Economic Thought - A 19th Century Perspectives,Tata Mc Grow Hill, New Delhi.

3. Rath Nilkanth(1995) V.M.Dandekar Social Scientist with a Difference : Journal of Indian School of Political Economy.Oct-Dec.1995, Vol-7 No-4.

4. Seshadri G.B.(1997): Economic Doctrines, Publishing Corporation, New Delhi.

5. चा.भ.खैरमोडे (१९७८) – डॉ.भीमराव रामजी आंबेडकर, खंड १ ला , खंड २ रा खंड ७ वा, प्रताप प्रकाशन.

6. गांधी मो.क.(१९९७) -मराठी अनुवाद सीताराम पुरोषोत्तम पटवर्धन'सत्याचे प्रयोग अथवा आत्मकथा पाचवी आवृत्ती.

7. डॉ.जे.एफ.पाटील (२०१५)– आर्थिक विचारांचा इतिहास, फडके प्रकाशन, कोल्हापूर.

8. इंगळे बी.डी. (२०११) आर्थिक विचारांचा इतिहास, अरुणा प्रकाशन, लातूर.

9. प्रा.रायखेलकर,डॉ.दामजी (२०११) – आर्थिक विचारांचा इतिहास, विद्या बुक पब्लिशर्स,औरंगाबाद.

10. प्रा.डॉ.अनिलकुमार वावरे, प्रा.संजय धोंडे, व डॉ.अनिल सत्रे (२०१४)– आर्थिक विचारांचा इतिहास, एज्युकेशनल पब्लिशर्स ॲन्ड डिस्ट्रिब्युटर्स,औरंगाबाद.

11. प्रा.रा.म.गोखले - आर्थिक विचारांचा इतिहास

12. डॉ.विजय कविमंडन - आर्थिक विचारांचा इतिहास

SHIVAJI UNIVERSITY, KOLHAPUR

Revised Syllabus for

Bachelor of Arts (Part- III)

SEMESTER V & VI

HISTORY

(Syllabus to be implemented from June 2020 onwards)

EQUIVALANCE OF B.A. III HISTORY SEMESTER- V

Semester	Paper No	Title of Old Paper (June 2015)	Semester	Course No	Title of New Course (June 2020)
V	Paper No. VII	History of Ancient India (From Prehistory to 3rd c. BC)	V	Course No. VII	Early India (from beginning to 4th c. BC)
V	Paper No. VIII	Political History of Medieval India (1206 to 1707 A.D.)	V	Course No. VIII	History of Medieval India (1206-1526 AD)
V	Paper No. IX	India Since Independence –I	V	Course No. IX	Age of Revolutions
V	Paper No. X	History of the Marathas (1707-1818)	V	Course No. X	Political History of the Marathas
V	Paper No. XI	Introduction to Historiography	V	Course No. XI	History: Its Theory

EQUIVALANCE OF B.A. III HISTORY SEMESTER VI

Semester	Course No	Title of Old Paper	Semester	Course No	Title of New Course
VI	Paper No. XII	History of Ancient India (From 3 c. BC to 7th c. AD)	VI	Course No. XII	Ancient India (From 4th c. BC to 7th c. AD)
VI	Paper No. XIII	Socio-Economic and Cultural History of Medieval India (1206 to 1707 A.D.)	VI	Course No. XIII	History of Medieval India (1526-1707 AD)
VI	Paper No. XIV	India Since independence- II	VI	Course No. XIV	Making of the Modern World (16th to 19th Century)
VI	Paper No. XV	Modern Maharashtra (1960 to 2000)	VI	Course No. XV	Polity, Economy and Society under the Marathas
VI	Paper No. XVI	Applications of History	VI	Course No. XVI	Methods and Applications of History

STRUCTURE OF PROGRAMME
REVISED SYLLABUS B.A. PART III (HISTORY)

Sr.No	Semester	Title of Course	Course No.	Credit	Workload	Total Credits	Theory Marks	Term Work/ Seminar
1	V	Early India (from beginning to 4th c. BC)	Course No. VII	04	4 lectures/ Week	20 Credits	40	10
2	V	History of Medieval India (1206-1526 AD)	Course No. VIII	04	4 lectures/ Week		40	10
3	V	Age of Revolutions	Course No. IX	04	4 lectures/ Week		40	10
4	V	Political History of the Marathas	Course No. X	04	4 lectures/ Week		40	10
5	V	History: Its Theory	Course No. XI	04	4 lectures/ Week		40	10
Sr.No	Semester	Title of Course	Course No.	Credit	Workload	Total Credits	Theory Marks	Term Work/ Group Project
6	VI	Ancient India (From 4th c. BC to 7th c. AD)	Course No. XII	04	4 lectures/ Week	20 Credits	40	10
7	VI	History of Medieval India (1526-1707 AD)	Course No.XIII	04	4 lectures/ Week		40	10
8	VI	Making of the Modern World (16th to 19th Century)	Course No. XIV	04	4 lectures/ Week		40	10
9	VI	Polity, Economy and Society under the Marathas	Course No. XV	04	4 lectures/ Week		40	10
10	VI	Methods and Applications of History	Course No. XVI	04	4 lectures/ Week		40	10

B.A. Part -III, (History)
Semester –V, Course VII DSE E-61
Paper VII : Early India (from beginning to 4th c. BC)

Course Objectives: This course explores the major historical developments in India from the beginning to the 4rd Century B.C. It traces the history of the Indian subcontinent from the Paleolithic period to the establishment of the Mauryan state. The student will be introduced to the political, social, economic and religious developments in India during this formative period. This course will help the students to understand how India came to be. They will know the facts about the early period of Indian history up to the 4[th]century B.C. They will get an introduction to the beginnings of India's political, socio-economic and cultural dynamics and understand the legacy of Ancient India.

Course Outcomes:
After studying the course the student will be able to …
1) Understand the transition of humans in India from Hunters to Farmers
2) Explain the transition from Early to Later Vedic period.
3) Clarify the causes for the first and second urbanizations
4) Give an account of the teachings of Gautama Buddha and Vardhamana Mahavira
5) Describe the rise and growth of the Mauryan Empire
6) Explain the salient features of Ashoka's Dhamma

Module I:The Beginning
a) The Hunter-Gatherers: Paleolithic and Mesolithic
b)The Early Farmers: Neolithic and Chalcolithic
c) The First Urbanization: Harappan Civilization
d)The Megalithic Nomads: Burial types, nature of remains

Module II: The Vedic Age and Epics
a) Vedic literature
b) Transition from Early to Later Vedic period: Polity and Economy
c)Transition from Early to Later Vedic period: Society and Religion
d) The Epics: Ramayana and Mahabharata

Module III: The Second Urbanization
a) Nature of second urbanization
b) Emergence of Regional States (16 Maha-janapadas)
c) Gautama Buddha- His teachings
d) Vardhamana Mahavira- His teachings

Module IV: The Mauryan Empire
a) Sources: Arthashastra and Indica
b) Chandragupta Maurya and Ashoka
c)Mauryan administration
d) Ashoka's Dhamma

Select Reference Books:

- Allchin, B. G.; Allchin, B.; Allchin, R.; Yoffee, N.; Alcock, S.; Dillehay, T. et al. (1982): The Rise of Civilization in India and Pakistan: Cambridge University Press (Cambridge World Archaeology).

- Habib, I.; Thakur, V. (2016): The Vedic Age: Tulika Books (A People's History of India Series).

- Jha, D. N. (1977): Ancient India: an introductory outline: People's Pub. House.

- Kosambi, D. D. (1975): An Introduction to the Study of Indian History: Popular Prakashan.

- Majumdar, R. C.; Bharatiya Vidya Bhavan; Bharatiya Itihasa Samiti (1951): The History and Culture of the Indian People: The Vedic age: G. Allen 8 Unwin (The History and Culture of the Indian People).

- Sharma, R. S. (1991): Aspects of Political Ideas and Institutions in Ancient India: Motilal Banarsidass.

- Sharma, R. S. (2006): India's Ancient Past: OUP India.

- Sharma, R. S. (2007): Material Culture and Social Formations in Ancient India: Macmillan India.

- Sharma, R. S.; Kumar, D. (2018): Bharat Ka Prachin Itihas: Oxford University Press India.

- Singh, U. (2009): A History of Ancient and Early Medieval India: From the Stone Age to the 12th Century (PB): Pearson India.

- Thapar, R. (2004): Early India: From the Origins to AD 1300: University of California Press.

- Thapar, R. (2012): Asoka and the Decline of the Mauryas: OUP India (Oxford India Perennials).

- थापर रोमिला, अर्लि इंडिया, के सागर पब्लिकेशन; पुणे, २०१३

- थापर रोमिला दी पेंग्वीन हिस्टरी ऑफ अर्लीं इंडिया, के सागर पब्लिकेशन्स; पुणे, २०१८

- वासंती फडके (अनु.), एंशंट इंडिया (प्राचीन भारत) मूळ लेखक शर्मा आर.एस., के सागर पब्लिकेशन; पुणे, २०१५

- रोमिला थापर, लिखित अशोक आणि मौर्यांचा ऱ्हास, (Asoka and the Decline of the Mouryas या पुस्तकाचा अनुवाद). अनुवादिका. डॉ. सौ. शरावती शिरगावकर. अनुवादिका, महाराष्ट्र राज्य, महाराष्ट्र राज्य साहित्य आणि संस्कृती मंडळ, मुंबई, २००७ (https://sahitya.marathi.gov.in/scans/Ashok%20Ani%20Mauryacharhas_131.pdf)

- ढवळीकर, मधुकर केशव., आर्यांच्या शोधात, राजहंस प्रकाशन; पुणे, २०१२

- ढवळीकर, मधुकर केशव, कोण होते सिंधू लोक ?, राजहंस प्रकाशन प्रा लि; पुणे, २०१६

- ढवळीकर, मधुकर केशव, कोणे एके काळी सिंधु संस्कृती, राजहंस प्रकाशन, पुणे, २००६

B.A. Part III
Semester V, Course No: VIII DSE E-62
History of Medieval India (1206-1526 AD)

Course Objectives: This course covers the important period of Medieval Indian History. It was during this period that the Sultans established their rule in India. They introduced fundamental changes in polity, society, religion and culture of India. The course will acquaint the with various sources of medieval Indian history. They will get knowledge about the activities of major rulers and the policies followed by them. The students will know about the agricultural condition, development of trade and industry as well as the social, religious and architectural milieu of the period.

Course Outcomes:

After studying the course the student will be able to…

1) Describe the different types of historical sources available for writing the history of medieval India

2) Explain the contributions of medieval rulers like Allaudin Khilji, Muhammad-bin-Tuqhlaq, Krishnadevraya, and Mahmud Gavan

3) Give an account of the administration and economy of the Delhi sultanate and Vijayanagar Empire

4) Elucidate the significant developments which took place in religion, society and culture

Module I - Sources:

  a) Literary: Tarikh-i- Firozshahi, Amuktamalyada

  b) Archaeological (excluding Monuments)

  c) Account of Foreign Travelers: Ibn Battuta, Domingo Paes

Module II - Major Rulers

  a)Allaudin Khilji: Internal policy and reforms

  b) Muhammad - bin- Tughlaq : Experiment of Token Currency

  c) Krishnadevraya: Military success and cultural contribution

  d) Mahmud Gavan: Contribution to Bahmani Kingdom

Module III - Administration and Economy(Delhi Sultanate and Vijaynagar)

  a) Administration : Central and Provincial

   b) Agriculture and Land Revenue

  c) Industry and Trade

 Module IV) Religion, Society and Culture:

  a) Sufi Order: Chishti Silsila; Bhakti Movement: Sant Kabir; Sikh Religion: Guru Nanak

   b) Society: Hindu and Muslim

  c)Architecture: Delhi Sultanate, Vijaynagar and Bahamani.

Select Reference Books:

- Rizvi, S.A.A., The Wonder that was India, Part II, Rupa, Delhi,2002

- Chitnis, K.N., Glimpses of Medieval Indian Ideas and Institutions, 1974

- Chitnis K. N. Socio- Economic Aspects of Medieval India, Poona, 1979

- Mehta, Jaswant Lal, Advanced Study in the History of Medieval India, Volume I to III, Sterling, New Delhi, 1981.

- Raychaudhuri Tapan and Irfan Habib (eds.), Cambridge Economic History of India, Vol. I. C. 1200 C. 1750., Delhi, S. Chand, 1984.

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B.A. Part III
Semester V, Course No: IX DSE E-63
Age of Revolutions

Course Objectives: This course introduces the students to the pathbreaking events of global history. The students will study the accounts of the causes and consequences of the transformative revolutions which changed the history of mankind. They brought about sudden big changes not only in the country in which they happened but also the world in general. Most of them left a lasting effect on the thought and the socio-political and cultural conditions of mankind. The course has been framed to make the students aware of the change and impact of these revolutionary events.

Course Outcomes:
After studying the course the student will be able to…
1) Explain the causes and consequences of the Reformation
2) Give an account of the role played by Martin Luther
3) Explain the salient features of the Industrial revolution
4) Given an account of the American revolution
5) Explain the causes, effects and major events of French Revolution
6) Explain the role of major leaders of the French Revolution

Module I: Reformation (16th Century)
a) Causes
b) Role of Martin Luther
c) Consequences

Module II: Industrial Revolution (18th Century)
a) Causes
b) Major Developments
c) Effects

Module III: American Revolution (1776)
a) Causes
b) Important events
c) Impact

Module IV: French Revolution (1789)
a) Causes
b) Important events and major leaders
c) Impact on the world

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- Arun Bhattacharjee, World Revolutions, Ashish Publishing House, New Delhi, 1988

- L. Mukherjee, A Study of Modern Europe and the World, Calcutta, 2011

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- केळकर न. चिं., फ्रेंच राज्यक्रांती, भावे प्रकाशन, १९८९

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- मॉरिसन रिचर्ड बी (भाषांतर परांजपे वा. कृ), अमेरिकन क्रांति, सौ. सुलोचना लिमये, १९५७

B.A. Part - III
Semester V, Course No. X DSE E-64
Political History of the Marathas

Course Objectives: The course is designed to study the political condition of Marathas after 1707. The Maratha polity was transformed into the largest political entity of India in the eighteenth century. The course introduces the students to the political developments which led to the expansion of Maratha power in the eighteenth century. It also explores the causes and events which led to the eventual decline of Maratha power.

Course Outcomes:

After studying the course the student will be able to…

1) Describe the political conditions of the Marathas upto the year 1740
2) Explain the role of Balaji Bajirao.
3) Explain the causes and effects of the Battle of Panipat.
4) Understand the political condition of the Marathas after 1761.
5) Critically analyze the causes for the decline of Maratha power.

Module I: Political condition up to 1740

a. Release of Shahu; Struggle between Shahu and Maharani Tarabai.
b. Balaji Vishwanath : Delhi Campaign, Maratha Confederacy
c. Bajirao Peshwa: Northern Policy, Relations with Nizam

Module II: Balaji Bajirao and Battle of Panipat(1761)

a. Relations with Angre
b. Conflict with Raghuji Bhosale
c. Battle of Panipat-1761

Module: III Political condition after 1761

a. Madhavrao Peshwa
b. Mahadji Shinde
c. Nana Phadnavis

Module IV: Decline of the Maratha Power

a. Peshwa Bajirao II
b. Second and Third Anglo- Maratha War
c. Causes for the decline of Maratha power

Select Reference books :

- अप्पासाहेब पवार (संपा) : ताराबाई कालीन कागदपत्रे, खंड १, शिवाजी विद्यापीठ, २०१८

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- सेतुमाधवराव पगडी : मराठ्यांचे स्वातंत्र्ययुद्ध , पुणे, १९६२

- महादेव गोविंद रानडे, मराठी सत्तेचा उत्कर्ष, वरदा प्रकाशन, २०१६
- प्र.न.देशपांडे : मराठी सत्तेचा उदय आणि उत्कर्ष, स्नेहवर्धन पब्लिशिंग हाऊस, पुणे, २००१
- न.र.फाटक :(अनु.) : मराठी सत्तेचा उत्कर्ष, (म.गो.रानडेकृत राईज ऑफ मराठा पॉवर चे भाषांतर)
- जयसिंगराव पवार : महाराणी ताराबाई, ताराराणी विद्यापीठ प्रकाशन, १९७५
- जयसिंगराव पवार मराठी साम्राज्याचा उदय आणि अस्थ, कोल्हापूर , १९९३
- त्र्यं.श.शेजवलकर, श्री शिवछत्रपती- संकल्पित शिवचरित्राची प्रस्तावना, आराखडा. व साधने, मराठा मंदीर प्रकाशन, मुंबई, १९६४.
- त्र्यं.श.शेजवलकर , पानिपत १७६१, जोशी आणि लोखंडे प्रकाशन, १९६१
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- S.R. Sharma- The founding of Maratha freedom, Orient Longmans, Bombay, 1964
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- S.N.Sen-, Anglo Maratha Relations 1785-1796, Macmillan , Madras, 1974
- P.C.Gupta, Bajirao II and East India Company, Allied Publications Private Limited, Calcutta, 1964
- Brij Kishore, Tarabai and his Times , Bombay , 1963
- G.S. Sardesai- New History of Maratha's Vols I,II and III, Bombay, 1948

B.A. Part III:
Semester V, Course No. XI DSE E-65
History: Its Theory

(Field visit to any important historical place, monuments and record offices is essential)
Course Objectives:

This course has been designed to impart knowledge of the discipline of history to the students. The students will learn the nature and scope of the discipline. They will have a clear understanding of the nature of the evidence collected from primary and secondary sources. They will be introduced to the process of presenting and writing history. They will know the methods of writing history.

Course Outcomes:
After studying the course the student will be able to…
1) Understand the definition and scope of the subject of History
2) Know the process of acquiring historical data
3) Explain the process of presenting and writing history
4) Understand the methods of writing history

Module I: History: Definition and Scope

a) Meaning, Scope and Nature

b) Types of History

c) Interdisciplinary Approach

Module II: Acquisition of Historical Data

a) Sources: Nature and Types

b) Methods of Data Collection

c) Methods of Critical Enquiry

Module III: Process of presenting and writing history

a) Steps of Historical Research

b) Data Analysis and Interpretation

c) Presentation

Module IV: Methods of History writing

a) Notetaking

b) Footnotes and Endnotes

c) Index, Appendix, Bibliography

Select Reference books:

- B. Shaik, Ali., History, Its Theory and Method, Macmillan India Ltd, Madras, 1978

- Carr, E. H., What is History, Palgrave Publishers Ltd., Macmillan, 1986

- Chitnis, K. N., Research Methodology in History, Poona, 1979

- Bajaj, S. K., Research Methodology in History, Anmol Publications Pvt. Ltd., New Delhi, 1998

- Collingwood, R. G., The Idea of History, Oxford University Press, Oxford 1978

- Gottschalk, Louis., Understanding History, New York, Second Edition, 1969

- Majumdar, R. C., Historiography in Modern India, Bombay, 1970.

- कोठेकर, शांता., इतिहास तंत्र आणि तत्त्वज्ञान, श्री साईनाथ प्रकाशन, नागपूर, २००५

- गायकवाड, आर. डी., सरदेसाई, बी. एन. आणि हनमाने, व्ही. एन. इतिहासलेखन पद्धत व ऐतिहासिक स्मारके यांचा अभ्यास, फडके प्रकाशन, कोल्हापूर, १९८८

- गद्रे, प्रभाकर., इतिहास लेखनाच्या परंपरा, श्री मंगेश प्रकाशन, नागपूर, २००४

- सरदेसाई, बी. एन., इतिहासलेखनपद्धती, फडके प्रकाशन, कोल्हापूर, २००४

- राजदेरकर, सुहास., इतिहासलेखनशास्त्र, विद्या प्रकाशन, नागपूर, १९९८

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- देशमुख, प्रशांत., इतिहासाचे तत्त्वज्ञान, विद्या बुक्स पब्लिशर्स, औरंगाबाद, २००५

- लेले, वि. गो., (अनुवादक) इतिहास म्हणजे काय? कॉन्टिनेन्टल प्रकाशन, पुणे, १९९४

- आठवले, सदाशिव., इतिहासाचे तत्त्वज्ञान, प्राज्ञपाठशाला, वाई, १९६७

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SEMESTER VI
B.A. Part III
Semester VI, Course No. XII DSE E-186
Ancient India (From 4th c. BC to 7th c. AD)

Course Objectives: This course explores the history of India from the 4th century BC to the 7th century A.D. It takes a panoramic survey of the historical developments during this crucial period of Indian history. The course studies the eventful changes which took place under the Satavhana, Kushanas, Guptas, Vakatakas , Chalukyas and Pallavas. The students will be introduced to the incomparably vivid picture of India which prevailed during the ancient period. They will be acquainted with not only the glory of Ancient India but also the social inequality and social evils which have shaped India in the past.

  Course Outcomes:
  After studying the course the student will be able to…
  1) Know the political ,economic and religious developments which took place in early historic India
  2) Explain the role played by Major Satavahana, Kushana, Gupta and Vakataka Kings
  3) Give an account of the developments in the Post-Gupta period
  4) Have an informed opinion about the society and culture of Ancient India

Module I: Early Historic India
a)Sources: Gatha Saptashati, Periplus of the Erythraean Sea
b)Major Kings: Satavahana and Kushanas
c)Industry and Trade
d) Hinayana Buddhism

Module II: The Classical Age
a) Major Kings: Guptas and Vakatakas
b)Economy and Greater India
c)Literature and Science
d)Religion

Module III: The Post-Gupta Period
a) Source: Hiuen Tsang
b)North India: Harshavardhana
c) Deccan: Early Chalukyas of Badami
d) South India: Pallavas

Module IV: Society and Culture
a) Position of Women and Varna Structure (From Vedic period to Post-Gupta period)
b) Education
c) Art (From Mesolithic Art to Ajanta Paintings)
d) Architecture- (Rock-Cut Caves (Maharashtra) to Constructed Temples (Madhya Pradesh)

Select Reference Books :

- Jha, D. N. (1977): Ancient India: an introductory outline: People's Pub. House.

- Kosambi, D. D. (1975): An Introduction to the Study of Indian History: Popular Prakashan.

- Majumdar, R. C.; Bharatiya Vidya Bhavan; Bhāratīya Itihāsa Samiti (1951): The History and Culture of the Indian People: The Vedic age: G. Allen 8 Unwin (The History and Culture of the Indian People).

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- मोतीचंद्र, सार्थवाह, साहित्य अकादमी, नवी दिल्ली , २०१०

- कोसंबी डी. डी., प्राचीन भारतीय संस्कृती आणि सभ्यता , ICHR, डायमंड प्रकाशन, २००६

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B.A. Part III
Semester VI, Course No. XIII DSE E-187
History of Medieval India (1526-1707 AD)

Course Objectives : This course explores the history of the Mughal period in India. The Mughals introduced fundamental changes in the polity, economy, society, culture and religion of India. The Bahamani kingdom in the Deccan also split up into five smaller kingdoms during this period. In the course the students will be introduced to the important events, personalities and developments in India. They will know the policies followed by important rulers and will acquaint themselves with the general scenario prevalent in India during the period. They will understand how a syncretic culture developed in India during the period.

Course Outcomes:

After studying the course the student will be able to…

1) Know about the various sources for writing Medieval Indian history
2) Explain the role of rulers like Babar, Akbar, Chandbibi and Ibrahim Adilshah II
3) Gain knowledge about the administrative and revenue system
4) Describe the condition of Industry and trade
5) Explain important developments in religion, society and culture

Module I: Sources

a) Literary: Akbarnama, Gulshan -i -Ibrahimi
b) Archaeological (excluding monuments)
c) Accounts of Foreign Travelers: Francois Bernier, Niccolo Manucci

Module II - Major Rulers

a) Babar: Battle of Panipat and foundation of Mughal empire.
b) Akbar: Rajput policy
 c) Chandbibi
 d) Ibrahim Adilshah II

 Module III- Administration and Economy

a) Administration: Central and Provincial
b) Land Revenue: Akbar and Malik Ambar
c) Industry and Trade

 Module IV: Religion, Society and Culture

 a) Religious Policy: Akbar and Aurangzeb
 b) Society: Hindu and Muslim
 c) Architecture: Mughal and Adilshahi

Select Reference Books:

- Rizvi, S.A.A., The Wonder that was India, Part II, Rupa, Delhi, 2002

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- डब्ल्यू. एच. मूरलॅन्ड, अबकार कालीन हिंदुस्थान , ICHR, डायमंड प्रकाशन, पुणे, २००६

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- एन. ए. सिद्दिकी, मोगलकालीन महसूल पद्धती, ICHR, डायमंड प्रकाशन, पुणे , २००६

- जदूनाथ सरकार, औरंगजेब, डायमंड प्रकाशन, पुणे, २००६

B.A. Part III
Semester VI , Course No: XIV. DSE E-188
Making of the Modern World (16ᵗʰ to 19ᵗʰ Century)

Course Objectives: This course deals with significant events in global history. The primary objective of the course is to introduce the students to the important events which have happened in the world in modern times. These events which were revolutionary in character had a profound impact on the making of the modern world. The students will be acquainted with the events of the Glorious revolution in England. They will understand the causes for the rise and spread of Nationalism and Imperialism. Moreover, they will know about some select important personalities who contributed to the making of the Modern World.

Course Outcomes:

After studying the course the student will be able to…

1) Know the causes and consequences of the Glorious revolution in England
2) Explain the concept of Nationalism and account for its rise and spread.
3) Describe the unification of Italy and Germany.
4) Give an account of the rise, growth and impact of Imperialism
5) Explain the significance of the Partition of Africa
6) Know the life and thoughts of important leaders like Metternich, Karl Marx and Abraham Lincoln

Module I: Glorious Revolution
a)Causes
b) Major events
c) Consequences

Module II: Nationalism
a) Causes for the rise and spread of Nationalism
b) Unification of Italy and Germany
c) Impact

Module III : Imperialism
a) Causes for rise and growth of Imperialism
b) Partition of Africa
c) Impact on the world

Module IV: Important Personalities
a) Metternich
b) Karl Marx
c)Abraham Lincoln

Select Reference books:

- Arun Bhattacharjee, World Revolutions, Ashish Publishing House, New Delhi, 1988
- L. Mukherjee, A Study of Modern Europe and the World, Calcutta, 2011
- David Thompson, Europe Since Napoleon, Penguin books, 1971
- T.C.W. Blanning, The Oxford History of Modern Europe, OUP, 2000

- C.J.H. Hayes, Modern Europe to 1870 , Macmillan, University of Michigan, 1953
- Desmond Seward, Metternich: The First European, Thistle Publishing, 2015
- मदन मार्डीकर, आधुनिक युरोपचा इतिहास इ.स. १७८१ ते १९४५, विद्या बुक्स, २००५
- लिमये, स्मिता, अब्राहम लिंकन: दास्यमुक्तिचा देवदूत, निधीगंधा बुक एजन्सी; नागपूर, २०१७
- कारखानीस सरला, कार्ल मार्क्स चरित्र आणि विचार, जयंत एस भट, १९६०
- बापट राम, कार्ल मार्क्सचा विचार, परामर्श प्रकाशन, १९८४

B.A. Part III
Semester VI, Course No. XV DSE E-189
Polity, Economy and Society under the Marathas

Course Objectives : The objective of the course is to explore the nature of the Maratha polity. It will acquaint the students with the economic and social condition prevalent under Maratha rule. The course will also introduce the students to the sources of Maratha history.

Course Outcomes:
After studying the course the student will be able to…
1) Know the various sources for writing the history of the Marathas
2) Explain the significant developments in the polity of the Marathas
3) Describe the economic conditions
4) Explain the social conditions.

Module I: Sources
a. Importance of sources
b. Indian Sources: Sanskrit, Marathi, Persian
c. Foreign sources : Portuguese and English

Module II: Polity under the Marathas
a. Concept of Kingship
b. Asthapradhan Mandal
c. Transfer of power – Chhatrapati to Peshwa, Peshwa to Karbhari

Module III: Economic condition
  a. Agrarian system – Land Revenue, Irrigation
  b. Industry
  c. Trade and Commerce

Module IV: Social condition
  a. Social Structure - Family , Untouchability, Vethbegar , Slavery.
  b. Condition of women and caste system
  c. Education and Festivals

Select Reference books :
- शेणोलीकर ह.श्री. महाराष्ट्र संस्कृती : घडण आणि विकास, मोघे प्रकाशन, कोल्हापूर, १९७२
- भावे. व. कृ. : शिवराज्य व शिवकाल, भावे प्रकाशन, पुणे, १९५९
- अत्रे. त्र्यं. ना. गाववाडा, राजहंस प्रकाशन प्रा लि., पुणे, २०१८
- वि. गो. खोबरेकर , महाराष्ट्रातील दप्तरखाने: वर्णन आणि तंत्र, १९६८
- कुलकर्णी अ. रा. : शिवकालीन महाराष्ट्र, १९९३ आवृत्ती

- गवळी पा. आ. : पेशवेकालीन समाज व जातीय संगर्ष, १९८२

- गवळी पा. आ., पेशवेकालीन गुलामगिरी व अस्पृश्यता, १९८१

- ओतुरकर, आर्. व्ही., पेशवेकालीन सामाजिक व आर्थिक जीवन, खंड १, भा. इ. सं. मं. , १९५०

- गवळी, पा. आ., पेशवेकालीन गुलामगिरी व अस्पृश्यता, प्राची प्रकाशन, कोल्हापूर, १९९०

- गवळी, पा. आ., पेशवेकालीन महाराष्ट्र-संस्था व संकल्पना, कैलास पब्लिकेशन्स औरंगाबाद, २०००

- चापेकर, ना. गो., पेशवाईच्या सावलीत, पुणे, १९३७

- जोशी, एस्. एन्., मराठेकालीन समाजदर्शन, अ. वि. गृह प्रकाशन, पुणे, १९६०

- हेरवाडकर, आर. व्ही., मराठी बखर, व्हीनस प्रकाशन, मुंबई, १९८६

- Chitnis, K. N., Glimpses of Medieval Indian Ideas and Institutions, 2nd ed., Pune, 1981

- Chitnis, K. N., Glimpses of Maratha Socio-Economic History, Atlanta Polishers, New Delhi, 1994

- Choksey, R. D., Economics Life in Bombay Deccan, Asia Publishing House, Mumbai 1955

- Desai, S.V., Social Life in Maharashtra under the Peshwas, Popular Prakashan, Bombay, 1962

- Duff, Grant., A History of Mahrattas, Vol. I to III, Oxford University Press, Calcutta, 3rd ed., 1921

- Gune, V. T., The Judicial System of the Marathas, Deccan College, Pune, 1953

- Kulkarni, A. R., Maharashtra in the Age of Shivaji (A Study in Economic History), Pune, 1969.

- Mahajan, T. T., Industry, Trade and Commerce during the Peshwa period, Jaipur, 1980

- Kadam V.S. Maratha Confederacy:A study in its origin and development, Munshiram Manoharlal Publishers Pvt Limited , 1993

- Fukazawa, H – The Medieval Deccan: Peasants, Social Systems and States Sixteenth to Eighteenth Centuries, OUP, New Delhi, 1999

B.A. Part III
Semester VI , Course No. XVI DSE E-190
Methods and Applications of History

Couse Objectives: This course has been designed to impart knowledge of the methods of history to the students. The students will understand the nature of archival sources. They will be introduced to the trends of local and oral history and will know about the tools of local history like Survey, Interview and Questionnaire. The students will be introduced to the technique of collecting data through oral interviews. The students will understand the concept of the museum and learn the basic principles of museology. Moreover, the course will introduce the students to the relevance of monumental heritage and its relationship with the discipline of history through the concept of Heritage Tourism

Course Outcomes:
After studying the course the student will be able to…
1) Understand the nature of archival sources
2) Gain conceptual clarity about recent trends in history.
3) Know about the application of history in museums.
4) Explain the concept and scope of heritage tourism.

(**Note: The students should undertake Individual/ Group field projects for assignments in which they could take oral interviews / surveys/ regarding persons, events and local socio-political, economic and cultural developments related to local history. They should make audio recordings of the interviews and develop an archive of local oral history in the college department. These audio interviews would form an important source of local history)**

Module I: Archival Sources
a) Meaning, types, and importance of Archives
b) Types of Records
c) Concept of Digital Archives
Module II: Recent Trends in History
a) Local History
b) Oral History
c) Tools of Local History (Survey, Interview, Questionnaire)
d) Interview Technique
Module III: Museology
a) Definition, Nature and Importance of Museum
b) Types of Museums
c) Methods of Collection, Conservation and Preservation Techniques of Objects

Module IV -Understanding Heritage Tourism
a) Concept, Scope and Significance of Heritage Tourism
b) Meaning and Historical Perspective of Tourism
c) World Heritage Sites in India

Select Reference books:

- B. Shaik, Ali., History:Its Theory and Method, Macmillan India Ltd, Madras, 1978

- Chitnis, K. N., Research Methodology in History, Poona, 1979

- Bajaj, S. K., Research Methodology in History, Anmol Publications Pvt. Ltd., New Delhi, 1998

- Sreedharan, E., A Textbook of Historiography 500 BC to AD 2000, Orient Longman, Hyderabad, 2000

- Sarkar, H., Museums and Protection of Monument and Antiquities in India, New Delhi, 1980

- Agarwal, O. P. Conservation of Manuscripts and Pantings of South East Asia, London, 1984

- कोठेकर, शांता., इतिहास तंत्र आणि तत्त्वज्ञान, श्री साईनाथ प्रकाशन, नागपूर, २००५

- गायकवाड, आर. डी., सरदेसाई, बी. एन. आणि हनमाने, व्ही. एन. इतिहासलेखन पद्धत व ऐतिहासिक स्मारके यांचा अभ्यास, फडके प्रकाशन, कोल्हापूर, १९८८

- गद्रे, प्रभाकर., इतिहास लेखनाच्या परंपरा, श्री मंगेश प्रकाशन, नागपूर, २००४

- सरदेसाई, बी. एन., इतिहासलेखनपद्धती, फडके प्रकाशन, कोल्हापूर, २००४

- राजदेरकर, सुहास., इतिहासलेखनशास्त्र, विद्या प्रकाशन, नागपूर, १९९८

- सरदेसाई, बी. एन., इतिहासलेखन परिचय, फडके प्रकाशन, कोल्हापूर, २००६

- देशमुख, प्रशांत., इतिहासाचे तत्त्वज्ञान, विद्या बुक्स पब्लिशर्स, औरंगाबाद, २००५

- बेंद्रे, वा. सी., शिवशाहीचा चर्चात्मक इतिहास: साधन चिकित्सा, लोकवाङ्मय गृह, मुंबई, १९७६

- आठवले, सदाशिव., इतिहासाचे तत्त्वज्ञान, प्राज्ञपाठशाला, वाई, १९६७

- धाटावकर, भास्कर., महाराष्ट्रातील शासकीय पुरालेखागारांची निर्मिती आणि कार्य, चेतन प्रकाशन, मुंबई, २०१०

- खोबरेकर, वि. गो., महाराष्ट्रातील दफ्तरखाने वर्णन व तंत्र, मुंबई, १९८८

- बोरकर, रघुनाथ, संग्रहालयशास्त्र, पिंपळापुरे बुक, नागपूर , २००७

- खतीब, के. ए., पर्यटन भुगोल, मेहता पब्लिशिंग हाऊस, पुणे, २००६

- आगलावे, प्रदीप., सामाजिक संशोधन- पद्धती शास्त्र व तंत्र, साईनाथ प्रकाशन, नागपूर, २०१९
- देव, प्रभाकर., इतिहास ऐक शास्त्र, कल्पना प्रकाशन नांदेड, १९९७
- राऊत, गणेश (संप), दत्तक गावांचा इतिहास, खंड १, २, ३, पुणे विद्यापीठ, पुणे, १९९९
- वांबूरकर जास्वंदी, इतिहास लेखनातील नवे प्रवाह, डायमंड प्रकाशन, पुणे, २०१५

SHIVAJI UNIVERSITY, KOLHAPUR.

Estd. 1962

NAAC 'A' Grade

Faculty of Commerce and Management

Syllabus For

B. Com. Part – III (Sem V & VI) (CBCS)

(To be implemented from June 2020 onwards)

(Subject to the modifications that will be made from time to time)

Modern Management Practice- Paper-I

Core Course

Introduced From June- 2020

Credit - 4

Objectives:
1. To impart knowledge of modern management
2. To understand concepts of CRM
3. To know the concepts of emotional and social intelligence
4. To understand the concept of lean and talent management

Unit-I	**Contribution to Modern Management Practice** a. Concept of Modern Management b. Contribution of Vijay Govindarajan: Three Box Solution and Reverse Innovation c. Contribution of Nirmalya Kumar: Thinking Smart d. Michael Porter : competitive advantage.	15 periods
Unit-II	**Emotional and Social Intelligence in Management** a. Emotional Intelligence: Concept, Components, Importance of emotional intelligence in leadership, Advantages and Disadvantages of emotional intelligence, emotional intelligence skills b. Social intelligence: Concept, Importance, Advantages and Disadvantages of social intelligence, Models of emotional and social intelligence:	15 periods
Unit-III	**Customer Relationship Management (CRM) and Supply Chain Management (SCM)** a. Customer Relationship Management (CRM) : Concept, Importance, Elements, Process, e-CRM b. Supply Chain Management (SCM): Concept, Importance, Components, Process, Benefits of SCM	15 periods
Unit-IV	**Lean Management and Talent Management** a. Lean Management: Concept, Principles, Benefits and disadvantages**,** tools of lean Management, lean management best practices b. Talent Management: Concept, Importance, Process, Components, benefits	15 periods

Modern Management Practice- Paper-II

Core Course

Introduced From June- 2020

Credit - 4

Objectives:

1. To impart knowledge of total quality management
2. To understand the Japanese and Chinese Management Practices
3. To know the concept of Event and Performance Management
4. To understand the concept of time and stress management

Unit-I	**Total Quality Management (TQM) and Quality Standards** a. Total Quality Management (TQM) : Concept, Principles, Elements of TQM, Benefits and Disadvantages of TQM b. Quality Standards: Benchmarking(concept and types) Six Sigma,(concept and levels) ISO: 9000, (Importance and elements)	15 periods
Unit-II	**Japanese and Chinese Management Practice** a. Japanese Management: Concept, Characteristics and 8 Key Japanese Quality Management techniques b. Chinese management: Concept, Characteristics, Chinese Leadership Style, Difference between Chinese and Western Management	15 periods
Unit-III	**Event and Performance Management** a. Event Management: Concept, Importance, Procedure, Types of events, benefits of event Management b. Performance Management : Concept, Evolution, Need, Process of Performance Management	15 periods
Unit-IV	**Time and Stress Management** a. Time Management: Concept, Importance, Techniques b. Stress Management: Meaning of Stress, Causes, Effects, Techniques of stress management	15 periods

Paper I : CC-C3 : Business Regulatory Framework

Credit –I	**Law of Contract- 1872**	Hours
	Definition of Business Law and its sources Definition of contract, Essential element and Kinds of Contract Offer and Acceptance, Capacity of Parties, Consideration, Free Consent and Legality of objectives， Void Contracts Discharge of Contract， Remedies for breach of contract	15 Hrs
Credit-II	**Labour Laws**	15 Hrs
	A) Employees Provident Fund Act- 1952- Meaning and its applicability criteria, Rates of Contribution , Periodicity of Payment and Return, Mandatory Records, Consequences of Non compliances	5 Hrs
	B) Employees State Insurance Act-1948- Meaning and its applicability criteria, Rates of Contribution , Periodicity of Payment and Return, Mandatory Records, Consequences of Non compliances	5 Hrs
	C) Payment of Gratuity (Amendment)Act-2018- Meaning and its applicability criteria, Rates of Contribution , Payment calculation, Mandatory Records, Consequences of Non compliances	5 Hrs
Credit-III	**Sale of Goods Act,1932 and Goods and Services Tax(GST)**	15 Hrs
	A) Sale of Goods Act- Contract of Sale of goods concept and essentials, Sale and Agreement to sell, Conditions and Warranties, Performance of Contract of Sale	10 Hrs
	B) Goods and Services Tax- Basic framework of GST, Applicability criteria, General understandings of legal provisions regarding invoices, GST Returns , Consequences of Non compliances	5 Hrs
Credit- IV	**Indian Partnership Act-1932 and Limited Liability Partnership Act-2008**	15 Hrs
	A) Indian Partnership Act-1932- Partnership Deed meaning and general terms and conditions, Role and Responsibilities of Partners.	5 Hrs
	B) Limited Liability Partnership Act- 2008- Nature and Silent features of LLP, Incorporation of LLP, Limitations of liability of LLP and Partners, Difference between Partnership and LLP.	10 Hrs

Reference-

1) Business Law- Kavita Krishnamurthi
2) Essentials of Business and Industrial Laws- B.S. Moshal
3) Business Law- M.C. Kuchhal
4) Elements of Mercantile Law- N.D. Kapoor
5) Mercantile Law- Arun Kumar
6) Mercantile Law- S.S.Gulshan
7) The Principles of Mercantile Law- Avtarsingh
8) Commercial and Industrial Law-A.K. Sen and J.K. Mitra
9) Textbook on Indian Partnership Act with Limited Liability Partnership Act- by Madhusudan Saharay
10) GST – Law and Procedure by Anananday Mishra – Taxman

Paper II : CC-C4 : Business Regulatory Framework

Credit- I	**Company Act- 2013** Meaning, Features and Types of Company, Process of Incorporation of Company, Role, Responsibilities and Powers of Directors, Auditors and Company Secretary. Rights of Share holders, Company meetings and Resolutions Winding up of Company	**15 Hrs**
Credit-II	**Security Exchange Board of India Act-1992, Consumer Protection Act-1986 and Competition Act-2002**	**15 Hrs**
	A) Security Exchange Board of India Act-1992(SEBI)- Role , Powers and Functions of SEBI, Listing and Trading of Securities	**5 Hrs**
	B) Consumer Protection Act-1986- Definitions- Consumer, Complaint, Complainant, Unfair Trade Practices, Restrictive Trade Practices, Rights of Consumer, Consumer Redressal Agencies- Composition and Jurisdiction.	**5 Hrs**
	C) Competition Act-2002- Objectives, Powers and duties of Competition Commission	**5 Hrs**
Credit-III	**Business Transactions and Cyber Laws**	**15 Hrs**
	a) E-commerce: Nature, formation, legality and recognition b) Intellectual Property Rights: Patent, Copy Right, Trademark and Industrial Design (only concepts) c) Digital Signature: Need, formation, functions, Digital Significance Certificate and Revocation of Digital Signature d) Cyber crimes and offences e) Penalties for cyber crimes	
Credit-IV	**Negotiable Instrument (Amendment) Act-2015**	**15 Hrs**
	Meaning and Features of Negotiable instrument, Kinds of Negotiable instrument, Promissory Note, Bill of Exchange and Cheque, Crossing of Cheque and Its kinds- Dishonour of Negotiable instrument and its consequences and Remedies thereon	

Reference Books:
1) Business Law- M.C. Kuchhal
2) Business Law- KavitaKrishanmurthi
3) Cyber Laws- Dr. Farooq Ahmed
4) Elements of Company Law- V.S. Datey
5) The Consumer Protection Act- ArshadSubzawari
6) The Consumer Protection Act- C.M. Dhopare
7) Cyber Laws- Krishna Kumar
8) Consumer Protection Act- Niraj Kumar
9) SEBI Act- Agarwal and Baby- Taxman
10) Competition Act- Dr.Rattan- Bharat Publication
Concerned Bare Act should be referred

Nature of Question Paper
Total Marks-40
Instructions – 1) All questions carry equal marks.
2) Attempt any FIVE Questions out of seven

Q.1	Short Notes (Any Two)	4 Marks Each
Q.2	Long Answers	8 Marks
Q.3	Long Answers	8 Marks
Q.4	Long Answers	8 Marks
Q.5	Long Answers	8 Marks
Q.6	Long Answers	8 Marks
Q.7	Short Answers (Any Two)	4 Marks Each

B.Com. Part-III; SEM-V - Under CBCS			
Paper-I : CC-C5 : Cooperative Development			

Course Outcomes:
1. To study the meaning and principles of Co-operation.
2. To study the agricultural and Non-agricultural Credit Co-operative institutions.
3. To study the Co-operative credit system
4. To Study the important cooperative organizations

Expected Skills Impartation
1. Ability to explain cooperatives principles
2. Ability to applications of cooperative principles
3. Interpretation and comparison of different cooperative organizations

Marks : 40	Total Lectures of Teaching : 60	Credits : 4	
Unit-1:	**Introduction to Co-operative movement in India** 1.1. Meaning, definition and features of Co-operation. 1.2. Principles of Co-operation - ICA and Manchester Principles 1.3. Role of Co-operation in economic development. 1.4. Review of Committees on Cooperative Development since 1991 (Vaidhyanathan Committee, Shivajirao Patil Committee and Kuraian and Alagh Committee)		15 Periods
Unit-2:	**Agricultural Co-operatives in India** 2.1. Co-operative Marketing- Types, functions, problems and remedies 2.2. NAFED- Objectives, Management, Functions and Progress 2.3. Co-operative Farming - Types, problems and remedies 2.4. Role of Dairy Cooperatives - National Dairy Development Board.		15 Periods
Unit-3:	**Co-operative Banking & Credit Societies in India** 3.1. Review of Co-operative credit movement - Three Tier and Two Tier Structure 3.2. Primary Agricultural Cooperative Societies -Functions, Problems and Remedies 3.3. DCC Banks - Administrative Structure, Progress, Problems and Remedies 3.4. State Cooperative Banks - Administrative Structure, Progress, Problems and Remedies		15 Periods
Unit-4:	**Important Cooperative Organizations in India** 4.1. Urban Cooperative Banks - Types, Management, Progress and Problems 4.2. Non-Agriculture Credit Cooperatives - Functions and Problems 4.3. Consumer Cooperatives - Types, Role and Problems 4.4. Sugar Co-operatives - Role, Progress, problems and remedies		15 Periods

References :

1. Dwivedi Ramesh Chandra, (2005), 'Hundred Years of Cooperative Movement in India'-Centre for Promotion of Cooperativism
2. Garg M. C. And Joshi N. N., (2009), 'Cooperative Credit And Banking –Strategies For Development', Deep And Deep Publication, New Dehli-110027
3. Hajela T.N., (1994) Cooperation: Principles, Problems and Practice, Konark Publishers, New Delhi.
4. Krishnaswamy O.R. and Kulandhiswamy V., (2000) Cooperation: Concept and Theory, Arudra Academy,
5. Kulkarni P. R. (2007) Laws of Co-operative Banking', Macmillan Publisher India Ltd. pp. 24-25 (2007)
6. Maharashtra Rajya Sahakari Dudh Mahasangh Maryadit http://www.mahanand.in/
7. NAFED http://www.nafed-india.com
8. Nakkiran S (2006) Cooperative Management : Principles and Techniques, Deep and Deep, New Delhi, 2006
9. National Dairy Development Board- https://www.nddb.coop/
10. Review of Co-operative Movement in India's Agricultural Credit Department, RBI. pp. 59-60, (1955)
11. Strickland C.F., (2010) 'An Introduction To Cooperation In India' Humphery Milford Oxford University Press.
12. The Maharashtra Co-operative Quarterly, The Maharashtra Rajya Shahakar Sanghah

Paper-II : CC-C6 : Cooperative Development

Course Outcomes:	

Course Outcomes:
1. To study the cooperative legislations and fund management
2. To understand the institutional arrangement for cooperative education and training
3. To understand the nature, registration, legislation and audit of housing cooperatives
4. To understand the cooperative audit system and provisions

Expected Skills Impartation
1. Legal understanding and interpretation skills
2. Ability to explain legal and technical provisions about cooperatives

Marks : 40	Total Lectures of Teaching : 60	Credits : 4	

Unit-1:	**Cooperative Laws and Legislation In India**
	1.1. Important Provisions under Maharashtra Co-operative Societies Act, 1960
	1.2. Salient Features of Multi-State Co-operative Societies Act 2002
	1.3. Liquidation Process- Appointment, Rights and Duties of Liquidator
	1.4. Legal Provisions regarding Assets and Fund Management of Cooperatives -
	    (Classification of Funds, Profit, Reserve Fund, Dividend, Expenses on social
	    Activities, Investment of Funds etc)
			15 Periods

Unit-2:	**Cooperative Education and Training In India** 2.1. Need and Importance of Cooperative Education and Training 2.2. National Council for Cooperative Training- Organizational Structure & Functions 2.3. VAMNICOM -Objectives, Centers, Training Programmes 2.4. Career Opportunities in Cooperative Sector - GDC&A Certification		15 Periods
Unit-3:	**Cooperative Housing Societies In India** 3.1. Meaning, Types and Registration Process of Housing Cooperatives 3.2. Maharashtra Co-operative Housing Society Model Bye Laws 3.3. Importance and Problems of Housing Societies 3.4. Audit of Co-operative Housing Societies- Nature and Elements		15 Periods
Unit-4:	**Cooperative Registrar & Audit In India** 4.1. Powers and responsibilities of registrar 4.2. Cooperative Audit - Concept, Scope, Types of Audits 4.3. Internal Audit-Nature- Duties of Internal Auditor 4.4. Responsibilities and powers of cooperative auditor		15 Periods

References :
1. Hajela T.N., (1994) Cooperation: Principles, Problems and Practice, Konark Publishers, New Delhi.
2. Indian Institute of Banking And Finance, (First Pub. 2007), 'Law of Cooperative Banking', Macmillan India Ltd. New Delhi
3. Kulkarni P. R. (2007) Laws of Co-operative Banking', Macmillan Publisher India Ltd. pp. 24-25 (2007)
4. Maharashtra Rajya Sahakari Dudh Mahasangh Maryadit http://www.mahanand.in/
5. Review of Co-operative Movement in India's Agricultural Credit Department, RBI. pp. 59-60, (1955)
6. Maharashtra Co-operative Societies Act, 1960
7. Maharashtra Co-operative Societies Act, 1960 by G. M.Divekar (Vol-I and II)
8. National Cooperative Development Corporation (NCDC) - http://www.ncdc.in
9. National Cooperative Housing Federation of India- https://www.nchfindia.net/
10. National Federation of State Cooperative Banks Ltd -http://nafscob.org/about_f.htm
11. National Cooperative Consumers` Federation Of India Limited- http://nccf-india.com/
12. National Council for Cooperative Training- http://ncct.ac.in
13. Dhananjayrao Gadgil Institute of Cooperative Management -http://www.dgicmnagpur.com

EQUIVALENCE OF THE PAPERS / COURSES

Sr	Existing title of the Paper	Revised Title of the paper
1	Co-operative Development Paper – I	Co-operative Development Paper – I
2	Co-operative Development Paper – II	Co-operative Development Paper – II

Nature of question paper for B.Com -III Co-operative Development

Semester V & VI (Paper No. I to II)

Attempt any five questions.

Total marks 40

Q1. Write short answers (any two out of three)	08
Q2. Broad question	08
Q3. Broad question	08
Q4. Broad question	08
Q5. Broad question	08
Q6. Broad question	08
Q7. Write short notes (any two out of three)	08

Paper I : CC-C7 : Business Environment

(Indian Economic Environment)
(Compulsory Paper)
Credits : 4

COURSE OUTCOMES:

1 Student should able to understand the significance and position of Indian economy at the world level.

2 Students should study the scenario of agricultural and industrial sectors.

3 Student should aware regarding Indian economy is facing some of the fundamental economic problems. They should able to make plans and solutions to these being as a citizen.

4 Student should understand the correlations between economical and social problems.

Unit No.	Unit Name	Periods
1	**Business Environment** 1.1 Concept 1.2 Components 1.3 Importance 1.4 Business environment and sustainable development	15
2	**Agricultural Development** 2.1 Present status of Indian Agriculture and Agricultural crisis 2.2 Agricultural Marketing-Problems, Agricultural price policy 2.3 Food security in India 2.4 National Commission on farmers- Agricultural Renewal Action Plan	15
3	**Industrial Development** 3.1 Industrial policy -1991 3.2 Concepts of Micro, Small and Medium Enterprises (MSMEs) 3.3 Progress of industrial sector in globalization era 3.4 Trade union movement – Problems and measures.	15
4	**Problems of Indian Economy** 4.1 Features of Indian population 4.2 Unemployment and poverty – causes and remedies 4.3 Inequality of Income and wealth, Black Money - Causes and remedies 4.4 Problems of rural and urban economy	15

References –

1. Mead R. (2004) International Management: Cross Cultural Dimensions,3rd ed. New York Wily
2. Vyuptakesh Sharan, (2004) International Business: Concept, Environment and Strategy, Pearson education, Singapore
3. Yarbraugh B V (2005) The World Economy: Trade and Finance, 7th Ed Thomas south western USA
4. Manab Adhikari,Global (2006) Business Management(An International economic environment), Macmillan India Ltd
5. Hill C.W. L. and jain A. K.(2007) International Business Competing in Global market Place, McGraw Hill New Delhi
6. Graham John L, Salwan Prashant, Cateora Philip R, (2008)International Marketing 13th Ed. Tata McGraw- Hill,
7. Jeevnandam C. International Business S.Chand New Delhi 2008
8. Paul Justein International Business, 5th Ed (2011)Prentice Hall of India,Pvt Ltd new Delhi
9. Keegan Warren J. and Green Mark C. Global Marketing,4th Ed.(2009) Prentice Hall India,Pvt Ltd
10. Bhalla V. K. and Ramu S.S.(2009)International Business Environment, Anmol Prakashan New Delhi
11. Varshney R.L. and Bhatacharya B, (2012)International Marketing Management -An Indian Perspective, 24th Ed S.Chand New Delhi.

12. Dutt and Sundaram K P M, Indian Economy S. Chand Delhi
13. Dutt Ruddar Economic Reforms in India –A Critique, S Chand , New Delhi.

14. Mishara S K and PuriV K - Indian Economy, Himalaya Publishing House

15. Namboodripad E M S, Indian Planning and Crises, National book Center New

   Delhi.

16. Sundaram and Black The International Business Environment Prentices New Delhi

Equivalence of the paper

Existing Title of the Paper	Revised Title of the Paper
Business Environment Paper I	Business Environment Paper I

B.Com Part III Semester - VI– (CBCS)

Paper II : CC-C8 : Business Environment

(Indian Economic Environment)

(Compulsory Paper)

Credits : 4

COURSE OUTCOMES:

1. Students will understand the Indian and global economic environment.

2. Students will equip with proper knowledge of Indian economic planning.

3. Students will enable with the knowledge of the plans and strategies toward foreign capital and multinational corporations.

4. Students will get acquainted with the functions, mechanism and performance of international financial, trade and regional cooperation institutions.

Unit No.	Unit Name	Periods
1	**Liberalization, Privatization and Globalization** 1.1 Concepts 1.2 Implementation and impact on Indian Economy. 1.3 Composition and direction of foreign trade in the Globalization era 1.4 Balance of payments crisis	15
2	**Economic Planning and Service Sector** 2.1 Economic planning – Broad objectives 2.2 NITI Aayog – Structure and functions 2.3 Planning process through NITI Aayog 2.4 Service Sector – Importance and progress of service sector in Indian economy.	15
3	**Foreign Capital and Multinational Corporations** 3.1 Need of foreign capital in India, 3.2 Policy of Government of India. 3.3 Multinational corporations- Definition, merits and demerits. 3.4 Exchange rates and Indian Rupee	15
4	**International Institutions** (Objectives and performance) 4.1 IMF 4.2 IBRD 4.3 WTO 3.3 SAARC	15

References

1. Mead R. (2004) International Management: Cross Cultural Dimensions, 3rd ed. New York Wily
2. Vyuptakesh Sharan, (2004) International Business: Concept, Environment and Strategy, Pearson education, Singapore
3. Yarbraugh B V (2005) The World Economy: Trade and Finance, 7th Ed Thomas south western USA
4. Manab Adhikari,Global (2006) Business Management(An International economic environment), Macmillan India Ltd
5. Hill C.W. L. and Jain A. K.(2007) International Business Competing in Global market Place, McGraw Hill, New Delhi
6. Graham John L, Salwan Prashant, Cateora Philip R, (2008)International Marketing 13th Ed. Tata McGraw- Hill.
7. Jeevnandam C. International Business S.Chand, New Delhi 2008
8. Paul Justein International Business, 5th Ed (2011)Prentice Hall of India, Pvt Ltd new Delhi

9. Keegan Warren J. and Green Mark C. Global Marketing, 4th Ed.(2009) Prentice Hall India, Pvt. Ltd.
10. Bhalla V. K. and Ramu S.S.(2009) International Business Environment, Anmol Prakashan, New Delhi.
11. Varshney R.L. and Bhatacharya B, (2012) International Marketing Management -An Indian Perspective, 24th Ed S. Chand, New Delhi.
12. Dutt and Sundaram K P M, Indian Economy, S. Chand, New Delhi.
13. Dutt Ruddar, Economic Reforms in India –A Critique, S Chand , New Delhi.

14. Mishara S K and Puri V K - Indian Economy, Himalaya Publishing House.

15. Namboodripad E M S, Indian Planning and Crises, National Book Center, New

Delhi.

16. Sundaram and Black The International Business Environment, Prentices, New Delhi

Equivalence of the papers

Existing Title of the Paper	Revised Title of the Paper
Business Environment Paper II	Business Environment Paper II

Nature of question paper for B.Com - III
Semester V and VI (Paper No. I to II)
Attempt any five questions.
Total Marks 40

Q1. Write short answers (any two out of three)   08

Q2. Broad question   08

Q3. Broad question   08

Q4. Broad question   08

Q5. Broad question   08

Q6. Broad question   08

Q7. Write short notes (any two out of three)   08

Paper – I : DSE-A1 : Advanced Accountancy
Discipline Specific Course

4 Credits

Course Outcomes:
1. Practice the preparation of financial statements of banks.
2. Demonstrate accounting for farms and hire purchase system.
3. Simulate accounting situations of insurance claim.
4. Explain the accounting process on Tally with GST.

Syllabus Content

Unit- I	Bank Final Accounts (Vertical Format Only)	20 Lectures
Unit- II	a) Farm Accounting	10 Lectures
	b) Hire purchase system-Excluding Hire purchase Trading Account	10 Lectures
Unit- III	Insurance Claim- Loss of stock and Loss of profit policy	10 Lectures
Unit- IV	GST Accounting with practical's using Tally part – I	10 Lectures

Theory

Introduction to GST on Goods, Introduction, Indirect Taxation prior GST, GST Implementation in India, Why GST was introduced in India? Understanding GST Taxation System, Dual GST, Structure of GST, Determination of Tax, Registration, GSTIN Structure, Businesses Liable to Register under GST, Tax Invoice, Bill of Supply, Supplementary Invoice, Input Tax Credit Set Off, GST Returns, Payment of Tax.

Practical:
a) Getting Started with GST (GOODS) in Tally ERP 9, Basic Concepts in GST, Configuring GST in TalIy. ERP 9, Company Setup, Enabling Goods & Services Tax (GST),
b) GST Classifications, Creating Masters, Creating Purchase Ledger, Creating Sales Ledger, Creating GST Ledger, Creating Party Ledger, Creating Stock Items
c) Entering Transactions, Creating Purchase Invoice with GST, Creating Sales Invoice with GST, Printing Sales invoice
d) GST Reports, GST Tax Payment

Reference Books:
1) Gupta, S. C.; Gupta, M. P.; Shukla, M. C.; Agrawal, B. M. and Grewal, T. S. (2019). Advanced Corporate Accounting, S. Chand & Company, New Delhi.
2) Shukla, M. C.; Grewal, T. S. and Gupta, S. C.; (2016). Advanced Accounts, S. Chand & Company, New Delhi.
3) Arulnandan, M. A. and Raman, K. S. (2018). Advanced Accountancy (Corporate Accounting) Vol. II, Himalaya Publishing House, Mumbai.
4) Gupta, R. L. and Radhaswamy, M. (2018). Advanced Accountancy Vol. II, Sultan Chand and Sons; New Delhi.
5) Maheshwari, S. N.; Maheshwari, Suneel and Maheshwari, Sharad K. (2018). Corporate Accounting. Vikas Publication House, New Delhi.

6) Jain, S. P.; Narang, K. L.; Agrawal, Simmi and Sehgal, Monik (2018). Advanced Accountancy Vol. I & II, Kalyani Publishers, New Delhi.
7) Hanif, M. and Mukharjee, A (2018). Modern Accountancy Vol. II, McGraw Hill Education India (Private) Ltd., Noida.
8) Chakraborty, Hrishikesh, Advanced Accountancy, Oxford University Press
9) Chougule, Rajan (2011). Computerized Accounting, Kolhapur.

Journals:
1) Indian Journal of Accounting
2) Chartered Accountant
3) Management Accountant

Nature of Question Paper
B.Com (CBCS) Part-III (Semester-V)
Advanced Accountancy Paper-I
Discipline Specific Course
(Introduced from June-2020)

Instructions:	i)	All the questions are compulsory.	Total : 40 Marks
	ii)	Figures to the right indicate full marks.	
	iii)	Use of calculator is allowed.	
Question 1		Problem on Bank Final Accounts (This problem should be on Profit & Loss Account, Balance Sheet alongwith required schedules)	16 Marks
Question 2		Attempt any two questions (out of three): (These questions will be practical problems on Unit-II & III)	16 Marks
Question 3		Write short notes (Attempt any two out of four)	08 Marks

Notes:
1) Practical examination for 10 marks will be conducted on Unit-IV of Paper-I.
2) External examiner will be appointed by the university to conduct this practical examination.
3) There will be 40 marks for University Written examination and 10 marks for practical examination. Thus Total marks will be 50.

Paper – II : DSE-A2 : Advanced Accountancy (Auditing)
Discipline Specific Course

4 Credits

Course Outcomes:
1. To understand the concept and types of audit
2. To identify the residential status and its implication on tax liability
3. To understand the concept of exemption from income
4. To know the computation of income from various sources as well as total income

Syllabus Content

Unit- I	**Nature and Scope of Audit:**	15 Lectures

Audit – Meaning and Nature, Scope of Audit, Objectives of Audit, Relationship of Audit with other disciplines, Difference between Audit and Investigation, Basic Principles Governing Audit, Statutory Audit, Internal Audit, Cost Audit, Tax Audit, Management Audit, Concept of Vouching, Verification and Valuation.

Unit- II	**Audit of Specific Items in Financial Statements:**	15 Lectures

A) Audit of sale of Products and Services; Audit of Interest Income, Rental Income, Dividend Income, Net gain/loss on sale of Investments; Audit of Purchases, Depreciation, Interest expense, Rent, Repair to building, Repair to Machinery, Insurance, Taxes, Travelling Expenses, Miscellaneous Expenses

B) Audit of Share Capital, Reserve & Surplus, Long Term Borrowings, Trade Payables (creditors), Provisions, Short Term Borrowings and Other Current Liabilities, Audit of Land, Buildings, Plant and Equipment, Furniture and Fixtures, Goodwill, Brand/Trademarks, Computer Software, Audit of Loans and Advances, Trade Receivables, Inventories, Cash and Cash Equivalents, Other Current Assets, Audit of Contingent Liabilities.

Unit- III	**Company Audit:**	15 Lectures

Eligibility, Qualifications and Disqualifications of Auditors; Appointment of auditors; Removal of auditors; Remuneration of Auditors; Powers and duties of auditors; Branch audit; Joint audit; Reporting requirements under the Companies Act, 2013 including CARO.

Unit- IV	**Special Audit and Audit Report:**	15 Lectures

Audit of special entities like Bank, Insurance Companies, Charitable Trust, Hotel and Hospital, Elements of Audit Report; Types of Reports – Clean, Qualified, Adverse, Disclaimer of Opinion;

Reference Books:
1) Tandon B.N., : Practial Auditing, S.Chand, New Delhi
2) Kumar, A., Sharma, R.; : Auditing Theory and Practice, Atlantic Publishers, New Delhi
3) Johnson S., Wiley L. : : Auditing – A Practical Approach, Wiley Publishing House
4) Garg Pankaj : Auditing and Assurance, Taxmann Publications, New Delhi
5) Bansal, Surabhi : Auditing and Assurance, Wolters Kluwel Publicattion
6) Sekhar G, Prasath B. : Auditing and Assurance, Taxmann, New Delhi
7) Dinkar Pagare :
8) The Institute of Chartered Accountants of India, Study Material for CA Inter/Final for Auditing

Nature of Question Paper
B.Com (CBCS) Part-III (Semester-V)
Advanced Accountancy Paper-II
(Auditing)
Discipline Specific Course
(Introduced from June-2020)

Instructions:	i)	All the questions are compulsory.	Total : 40 Marks
	ii)	Figures to the right indicate full marks.	
Question 1		Long Answer Questions A) 8 Marks B) 8 Marks	16 Marks
Question 2		Attempt Any Two (out of three)	16 Marks
Question 3		Write short notes (Attempt any two out of four)	08 Marks

B.Com (CBCS) Part-III (Semester-VI)
Paper- III : DSE-A3 : Advanced Accountancy
Discipline Specific Course

4 Credits

Course Outcomes:
1. Practice the preparation of financial statements of banks.
2. Demonstrate accounting for farms and hire purchase system.
3. Simulate accounting situations of insurance claim.
4. Explain the accounting process on Tally with GST.

Syllabus Content

Unit- I	Elements of Cost - Material, Labour, & Overheads, Preparation of Cost Sheet, Quotation	10 Lectures

Unit- II	**Financial Statement Analysis:**	20 Lectures

a) Financial Statement Analysis- Meaning, types, Limitations of financial statements, Meaning and Need of financial statement analysis and Techniques of financial statement analysis.

(b) Ratio Analysis– Meaning, Advantages and Limitations, Classification of Ratios- Profitability Ratios, Turnover Ratios, Solvency Ratios and Liquidity Ratios.

Unit- III	**Cash Flow Analysis:**	15 Lectures

Meaning of Cash Flow Analysis, Classification of Cash flows- Cash flow from Operating Activities, Cash flow from Investing Activities and Cash flow from Financing Activities, Cash and Cash equivalents, Extra-ordinary items, Preparation of Cash Flow Statement (As per AS-3)

Unit- IV	GST Accounting with practicals using Tally part - II	15 Lectures

Theory:
4. Introduction to GST on Services, Existing Registration, Supply of Goods and Services, Scope of Supply, Place of Supply, Time of Supply, Value of Supply ,Mixed Supply and Composition Supply, Accounting for

Return of Goods, Sales Returns, Purchase Returns, Credit Note, Debit Note, GST on Services, GST Reports & GST Returns

Practical:
a) Getting Started with GST in Tally ERP 9, Basic Concepts in GST, Configuring GST in Tally.ERP 9, Company Setup, Enabling Goods & Services Tax (GST), GST Classifications
b) Creating Masters, Creating Purchase Ledger, Creating Sales Ledger, Creating GST Ledger, Creating Party Ledger, Creating Stock Items
c) Entering Transactions, Creating Purchase Invoice with GST, Creating Sales Invoice with GST, Printing Sales invoice, Accounting for Return of Goods, Sales Returns, Purchase Returns
d) Accounting for GST on Services
e) GST Reports, Generating GSTR-1 Report in Tally.ERP 9, Generating GSTR-2 Report in Tally.ERP 9, GST Tax Payment, Time line for payment of GST tax, Modes of Payment, Challan Reconciliation, Exporting returns and uploading To GSTIN

Notes:
1) Practical problems in the university examinations will be asked on Unit-I, II & III (however, problems on Unit-II shall be asked on Ratio Analysis only).
2) College should make a provision of necessary computers and accounting software for commerce department to train the students in Tally with GST as prescribed in the syllabus.
3) A visit should be arranged for increasing awareness of students regarding Tally with GSTeither in any business unit, Company Office or the Office of any Chartered Accountant/ Professional Accountant.

Reference Books:
1) Advanced Cost Accounting - N K Prasad
2) Cost Accounting - Jain & Narang
3) Cost Accounting – Ravi M Kishore Taxman
4) Principles of Management Accounting - Manmohan Goyal
5) Management Accounting - I. M. Pandey
6) Cost & Management Accounting - Jain & Narang
7) Advanced Accountancy - R. R. Gupta
8) Cost and Management Accounting M N Arora Vikas Publication
9) Cost and Management Accounting T Thukaram Rao
10) Fundamentals of Management Accounting- I M Pandey
11) Cost and Management Accounting- Horngreen and Datar and others

Journals:
4) Indian Journal of Accounting
5) Chartered Accountant
6) Management Accountant

Nature of Question Paper
B.Com (CBCS) Part-III (Semester-VI)
Advanced Accountancy Paper-III
Discipline Specific Course
(Introduced from June-2020)

Instructions:	i)	All the questions are compulsory.	Total : 40 Marks
	ii)	Figures to the right indicate full marks.	
	iii)	Use of calculator is allowed.	
Question 1		Problem	16 Marks
Question 2		Attempt any one problem (out of two)	16 Marks
Question 3		Write short notes (Attempt any two out of four)	08 Marks

Notes:
1) Practical examination for 10 marks will be conducted on Unit-IV of Paper-III.
2) External examiner will be appointed by the university to conduct this practical examination.
3) There will be 40 marks for University Written examination and 10 marks for practical examination. Thus Total marks will be 50.

B.Com (CBCS) Part-III (Semester-VI)
Paper – IV : DSE-A4 : Advanced Accountancy (Taxation)
Discipline Specific Course

4 Credits

Course Outcomes:
1. To understand the basic concepts of income tax and basis of charge
2. To identify the residential status and its implication on tax liability
3. To understand the manner of computation of total income
4. To know the basic concepts about GST

Unit- I	**Basic Concepts:** A) Meaning of Income Tax, Basis of Charge, Rates of Tax, Concepts of Previous Year, Assessment Year, Person, Income, Assessee. B) Residential Status and Taxability - Meaning of Residential Status, Provisions for determination of Residential status and tax liability in respect of individual and HUF, Determination of Residential Status of Firms and Companies.	15 Lectures
Unit- II	**Exemptions and Deductions from total income** (in respect of individual only)	10 Lectures
Unit- III	**Heads of Income, Computation of total income and tax liability:** Income from Salary, Income from House Property, Income from Business/Profession, Income from Capital Gain, Income from Other Sources, Computation of Gross Total Income and Tax Liability in respect of Individuals only.	25 Lectures
Unit- IV	**Basics of GST:** Meaning and Features of GST, Benefits of GST, Need of GST, Constitutional Provisions of GST, Levy and Collection of GST, Introduction to CGST, SGST, IGST, UTGST.	10 Lectures

Reference Books:
1) Singhania, V.K. : Students' Guide to Income Tax, Taxmann Publication, New Delhi
2) Manoharan, T.N. : Direct Taxes : Snow White Publications, New Delhi
3) Singhania, Monica : Students' Guide to Income Tax and GST, Taxmann, New Delhi
4) Sury, M.M. : Goods and Services Tax in India,
5) Agarwal, CA VK : GST Guide for Students, Neelam Book House, Delhi
6) Datey, V.S. : GST Ready Reckoner, Taxmann, New Delhi
7) Thakkar, Vishal : GST for the Layman, TV18Broadcast Ltd.,

8) Kadkol M.B., Income Tax : Law and Practice,
9) Mehta : Income Tax Ready Reckoner
10) The Institute of Chartered Accountants of India, Study Material for CA Inter/Final for Taxation

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Nature of Question Paper
B.Com (CBCS) Part-III (Semester-VI)
Advanced Accountancy Paper-IV
(Taxation)
Discipline Specific Course
(Introduced from June-2020)

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Instructions:	i)	All the questions are compulsory.	Total : 40 Marks
	ii)	Figures to the right indicate full marks.	
Question 1		Practical Problem (Computation of Taxable Income and Tax Liability)	16 Marks
Question 2		Practical Problems -Attempt Any Two (out of three)	16 Marks
Question 3		Write short notes (Attempt any two out of four)	08 Marks

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B.Com (CBCS) Part-III (Semester-V)
Paper - I : DSE-C1 : Advanced Costing
Discipline Specific Course

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4 Credits

Course Outcomes:
1) To understand the basic concepts of cost accounting.
2) To classify the cost and apply the same for cost determination.
3) To understand the cost accounting procedure in respect of materials.
4) To know the application of cost accounting in determination of labour cost.

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Syllabus Content

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Unit- I	**Basics of Cost Accounting:**	10 Lectures

Meaning:- Concepts of Cost, Costing, Cost Accounting, Cost Accountancy; Nature, Scope, objectives and importance of Cost Accounting; Difference between Cost Accounting, Financial Accounting and Management Accounting.

Unit- II	**Elements of Cost:**	15 Lectures

Elements of Cost- Concepts of Material Cost, Labour Cost and Overheads; Classification of Cost, Cost Centre and Cost Unit, Cost Sheet, Tender and Quotation, Preparation of Cost Sheet.

Unit- III	**Material Cost:**	15 Lectures

Storage of Material, Objectives of Store Keeping, Fixation of Stock Levels and Economic Order Quantity; Pricing of Issue of Material – FIFO, LIFO, Simple Average Method, Weighted Average Method.

Unit- IV	**Labour Cost:**	20 Lectures

Labour Cost- Meaning and Importance, Time Keeping and Time Booking, Methods of Remuneration and incentives, Sound Wage policy (Characteristics and Factors considered for wage determination), Time Rate System, Piece Rate system, Taylor's Differential Piece Rate and Merrick's Differential / Multiple Piece Rate system, Halsey Plan and Rowan Plan.

Reference Books:
1) Practical Problems in Cost Accounting- S. P.Jain and K. L Narang, Kalyani publishes New Delhi

2) Cost Accounting Methods and Problems – B. K. Bhar, Academic publishers Kolkatta
3) Cost Accounting- S. P.Jain and K. L Narang, Kalyani publishes New Delhi
4) Principles and Practices of Costing - Lal and Nigam, Himalaya publishing house.
5) Cost Accounting - Lal and Nigam, Himalaya publishing house
6) Cost Management : Ravi M Kishore, Taxmann Publications

Nature of Question Paper
B.Com (CBCS) Part-III (Semester-V)
Advanced Costing Paper-I
Discipline Specific Course
(Introduced from June-2020)

Instructions:	i)	All the questions are compulsory.	Total : 40 Marks
	ii)	Figures to the right indicate full marks.	
	iii)	Use of calculator is allowed.	
Question 1	Practical Problems A) 8 Marks } B) 8 Marks }		16 Marks
Question 2	Attempt Any Two Practical Problems (out of three)		16 Marks
Question 3	Write short notes (Attempt any two out of four)		08 Marks

B.Com (CBCS) Part-III (Semester-V)
Paper - II : DSE-E2 : Advanced Costing
Discipline Specific Course

4 Credits

Course Outcome:
1) To identify the meaning of overheads and its classification
2) To understand different methods of absorption of overheads.
3) To find out the reasons for difference between profit as per cost and financial accounts.
4) To understand meaning of activity based costing and its practical application.

Syllabus Content

Unit- I   **Overheads:**   15 Lectures
Meaning, Classification of Overheads, Concepts of Allocation, Absorption, Apportionment and Reapportionment of overheads.

Unit- II   **Absorption of Overheads:**   15 Lectures
Meaning, Methods of Absorption: - Production Unit Method, Percentage on Direct Material Cost, Percentage on Direct Wages, Percentage of Prime Cost, Direct Labour Hour Method, Machine Hour Rate, Apportionment and Reapportionment of Overheads.

Unit- III   **Reconciliation of Cost And Financial Accounts:**   15 Lectures
Need for Reconciliation of Cost and Financial Accounts. Preparation of Statement of Reconciliation of Cost and Financial Accounts.

Unit- IV   **Activity Based Costing:**   15 Lectures
Meaning, Objectives, Advantages and Limitations of Activity Based Costing, Cost Drivers, Preparation of Statement of Cost as per Activity Based Costing.

Reference Books:
1) Practical Problems in Cost Accounting- S. P.Jain and K. L Narang, Kalyani publishes New Delhi
2) Cost Accounting Methods and Problems – B. K. Bhar, Academic publishers Kolkatta
3) Cost Accounting- S. P.Jain and K. L Narang, Kalyani publishes New Delhi
4) Principles and Practices of Costing - Lal and Nigam, Himalaya publishing house.
5) Cost Accounting - Lal and Nigam, Himalaya publishing house
6) Cost Management : Ravi M Kishore, Taxmann Publications

Nature of Question Paper
B.Com (CBCS) Part-III (Semester-V)
Advanced Costing Paper-II
Discipline Specific Course
(Introduced from June-2020)

Instructions:	i)	All the questions are compulsory.	Total : 40 Marks
	ii)	Figures to the right indicate full marks.	
	iii)	Use of calculator is allowed.	
Question 1	Practical Problems		16 Marks
	C)	8 Marks }	
	D)	8 Marks }	
Question 2	Attempt Any Two Practical Problems (out of three)		16 Marks
Question 3	Write short notes (Attempt any two out of four)		08 Marks

B.Com (CBCS) Part-III (Semester-VI)
Paper - III : DSE-C3 : Advanced Costing
(Methods of Cost Accounting)
Discipline Specific Course

4 Credits

Course Outcome:
1) To understand the concepts of job and unit costing.
2) To know the applications of process costing and joint product and by product accounting
3) To understand procedure of contract costing and its practical implementation
4) To identify meaning of service costing and its application.

Syllabus Content

Unit- I	**Job Costing and Unit Costing:**	15 Lectures
	Meaning, Features, Practical Applications of Job Costing and Unit Costing, Preparation of Job Cost Sheet.	

Unit- II	**Process Costing:**	15 Lectures
	Process Costing: Meaning and its Applications, Concept of Equivalent Production, Preparation of Process Accounts, Concepts of Joint Products and By Products. (Note : Problems on Process Costing excluding Equivalent Production).	

Unit- III	**Contract Costing:**	15 Lectures
	Contract Costing: Meaning, Features, Accounting Procedure, Retention money, Escalation Clause, Work in Progress, Cost Plus Contract. Preparation of Contract Account.	

Unit- IV	**Operation/ Service Costing:**	15 Lectures
	Service Costing : Meaning and Definition, Application of Service Costing, Determination of Service Cost in Transport Industry	

Reference Books:
1) Practical Problems in Cost Accounting- S. P.Jain and K. L Narang, Kalyani publishes New Delhi
2) Cost Accounting Methods and Problems – B. K. Bhar, Academic publishers Kolkatta
3) Cost Accounting- S. P.Jain and K. L Narang, Kalyani publishes New Delhi
4) Principles and Practices of Costing - Lal and Nigam, Himalaya publishing house.
5) Cost Accounting - Lal and Nigam, Himalaya publishing house
6) Cost Management : Ravi M Kishore, Taxmann Publications

B.Com (CBCS) Part-III (Semester-VI)
Advanced Costing Paper-III
(Methods of Cost Accounting)
Discipline Specific Course
(Introduced from June-2020)

Instructions:	i)	All the questions are compulsory.	Total : 40 Marks
	ii)	Figures to the right indicate full marks.	
	iii)	Use of calculator is allowed.	
Question 1	Practical Problems E) 8 Marks } F) 8 Marks }		16 Marks
Question 2	Attempt Any Two Practical Problems (out of three)		16 Marks
Question 3	Write short notes (Attempt any two out of four)		08 Marks

B.Com (CBCS) Part-III (Semester-VI)
Paper – IV : DSE-C4 : Advanced Costing
(Costing Techniques)
Discipline Specific Course

4 Credits

Course Outcome:
1) To know the applications of marginal costing in decision making.
2) To understand the concept of standard costing and analysis of variances.
3) To know the concept and types of budgets and concept of budgetary control.
4) To understand prospects of cost accounting standards.

Syllabus Content

Unit- I	**Marginal Costing:**	15 Lectures

Meaning and Importance of Marginal Costing, CVP Analysis, Profit – Volume Ratio, Break Even Point, Margin of Safety, Interpretation of BEP Analysis.

Unit- II	**Standard Costing:**	15 Lectures

Standard Costing : Meaning, Objectives, Features; Types of Standards, Variance Analysis – Material Cost Variance, Labour Cost Variance and Overhead Variance and Interpretation of Variance Analysis.

Unit- III	**Budget and Budgetary Control:**	20 Lectures

Meaning, Objectives, Types of Budgets; Preparation of Cash Budget, Fixed and Flexible Budget; Budgetary Control System- Features and Components.

Unit- IV	**Cost Audit and Cost Accounting Standards:**	10 Lectures

Cost Audit : Meaning, Legal Requirement, Objectives; Setting Process, List and Applicability of Cost Accounting Standards

Reference Books:
7) Practical Problems in Cost Accounting- S. P.Jain and K. L Narang, Kalyani publishes New Delhi
8) Cost Accounting Methods and Problems – B. K. Bhar, Academic publishers Kolkatta
9) Cost Accounting- S. P.Jain and K. L Narang, Kalyani publishes New Delhi
10) Principles and Practices of Costing - Lal and Nigam, Himalaya publishing house.
11) Cost Accounting - Lal and Nigam, Himalaya publishing house
12) Cost Management : Ravi M Kishore, Taxmann Publications

Nature of Question Paper
B.Com (CBCS) Part-III (Semester-VI)
Advanced Costing Paper-VI
(Costing Techniques)
Discipline Specific Course
(Introduced from June-2020)

Instructions:	i)	All the questions are compulsory.	Total : 40 Marks
	ii)	Figures to the right indicate full marks.	
	iii)	Use of calculator is allowed.	
Question 1	Practical Problems		16 Marks
	G) 8 Marks }		
	H) 8 Marks }		
Question 2	Attempt Any Two Practical Problems (out of three)		16 Marks
Question 3	Write short notes (Attempt any two out of four)		08 Marks

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B.Com (CBCS) Part-III (Semester-V)
Paper – I : DSE-D1 : Taxation
Discipline Specific Course

4 Credits

Course Outcomes:
1. To understand the basic concepts of income tax and basis of charge
2. To identify the residential status and its implication on tax liability
3. To understand the concept of exemption from income
4. To know the computation of income from various sources as well as total income

Syllabus Content

Unit- I	**Basic Concepts:**	10 Lectures
	Introduction to Income Tax Law, Meaning of Previous Year, Assessment Year, Person, Income, Assessee, Basis of Charge, Rates of Tax.	
Unit- II	**Residential Status and Taxability:**	15 Lectures
	Determination of Residential Status of Individual, HUF, Firm and Company; Taxable Income in respect of Resident Individual, Resident but Not Ordinarily Resident Individual, Non Resident Individual; Taxability of Resident as well as Non Resident Firms and Companies	
Unit- III	**Income Not Forming Part of Total Income (Exemptions):**	15 Lectures
	Concept of Exemption, Specific Provisions of Exemption under section 10 – Profit Sharing from Partnership Firm, Agricultural Income, Leave Travel Concession, Gratuity, Leave Encashment, House Rent Allowance	
Unit- IV	**Heads of Income:**	10 Lectures
	Features of Various Heads of Income – Salary, House Property, Capital Gain, Business/Profession, Other Sources, Determination of Taxable Income from Each of these Sources of Income, Computation of Total Income	

Reference Books:
1) Singhania, V.K. : Students' Guide to Income Tax, Taxmann Publication, New Delhi
2) Manoharan, T.N. : Direct Taxes : Snow White Publications, New Delhi
3) Singhania, Monica : Students' Guide to Income Tax and GST, Taxmann, New Delhi
4) Sury, M.M. : Goods and Services Tax in India,
5) Agarwal, CA VK : GST Guide for Students, Neelam Book House, Delhi
6) Datey, V.S. : GST Ready Reckoner, Taxmann, New Delhi

7) Thakkar, Vishal : GST for the Layman, TV18Broadcast Ltd.,
8) The Institute of Chartered Accountants of India, Study Material for CA Inter/Final-Taxation

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Nature of Question Paper
B.Com (CBCS) Part-III (Semester-V)
Taxation Paper-I
Discipline Specific Course
(Introduced from June-2020)

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Instructions:	i)	All the questions are compulsory.	Total : 40 Marks
	ii)	Figures to the right indicate full marks.	
	iii)	Use of calculator is allowed.	
Question 1		Practical Problem A) 8 Marks B) 8 Marks	16 Marks
Question 2		Attempt Any Two Questions on theory or problems (out of three)	16 Marks
Question 3		Write short notes (Attempt any two out of four)	08 Marks

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B.Com (CBCS) Part-III (Semester-V)
Paper – II : DSE-D2 : Taxation
Discipline Specific Course

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4 Credits

Course Outcomes:
5) To know the meaning of clubbing of income
6) To understand the provisions of set off and carry forward of losses
7) To find out the deductions available from Gross Total Income
8) To understand meaning the manner of computation of tax liability

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Syllabus Content

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Unit- I	**Clubbing of Income:**	10 Lectures
	Meaning of Clubbing of Income, Transfer of Income without Transfer of Assets, Income Arising from Revocable Transfers, Provisions relating to Clubbing, Income arising to Spouse, Minor Child.	

Unit- II	**Carry Forward and Set-Off of Losses:**	10 Lectures
	Concept of Carry Forward of Losses, Concept of Set-Off of Carried Forward Losses, Provisions relating to Set-Off and Carry Forward of Losses against various Heads of Income, Conditions for Carrying Forward of Losses.	

Unit- III	**Deductions from Gross Total Income:**	15 Lectures
	Concept of Deduction, Difference between Exemption and Deduction, Deduction from Gross Total Income in respect of Payments, Specific Provisions about Deduction under Section 80 C, 80|D, 80 E and 80 G.	

Unit- IV	**Computation of Total Income and Tax Liability:**	25 Lectures
	Determination of Gross Total Income considering various sources of Income, Computation of Taxable Income considering deductions, Computation of Tax Liability in case of Individual, H.U.F., Firm and Company Considering rates of tax.	

Reference Books:
1) Singhania, V.K. : Students' Guide to Income Tax, Taxmann Publication, New Delhi
2) Manoharan, T.N. : Direct Taxes : Snow White Publications, New Delhi
3) Singhania, Monica : Students' Guide to Income Tax and GST, Taxmann, New Delhi
4) Sury, M.M. : Goods and Services Tax in India,
5) Agarwal, CA VK : GST Guide for Students, Neelam Book House, Delhi
6) Datey, V.S. : GST Ready Reckoner, Taxmann, New Delhi

7) Thakkar, Vishal : GST for the Layman, TV18Broadcast Ltd.,
8) The Institute of Chartered Accountants of India, Study Material for CA Inter/Final-Taxation

Nature of Question Paper
B.Com (CBCS) Part-III (Semester-V)
Taxation Paper-II
Discipline Specific Course
(Introduced from June-2020)

Instructions:	i)	All the questions are compulsory.	Total : 40 Marks
	ii)	Figures to the right indicate full marks.	
	iii)	Use of calculator is allowed.	
Question 1		Practical Problem C) 8 Marks D) 8 Marks	16 Marks
Question 2		Attempt Any Two Questions on theory or problems (out of three)	16 Marks
Question 3		Write short notes (Attempt any two out of four)	08 Marks

B.Com (CBCS) Part-III (Semester-VI)
Paper - III : DSE-D3 : Taxation
Discipline Specific Course

4 Credits

Course Outcomes:
1. To understand the concepts of TDS, TCS and Advance Tax
2. To know the procedure of filing of income tax return
3. To understand procedure of assessment and various types of assessments
4. To know the powers and functions of income tax authorities

Syllabus Content

Unit- I **TDS, TCS and Advance Tax:** 15 Lectures
Concepts of Advance Tax, Tax Deducted at Source and Tax Collected at Source; Provisions relating to Interest for Default in Payment of Advance Tax, TDS and TCS; Tax Deduction and Tax Collection Account Number; Filing of TDS Returns.

Unit- II **Self Assessment Tax and Filing of Income Tax Return:** 15 Lectures
Payment of Self Assessment Tax, Filing of Income Tax Return, Compulsory Filing of Return, Penalty for Default in Filing of Return, Return of Loss, Provisions related to Revised and Belated Return, Procedure of Online Payment of Tax and Filing of Return.

Unit- III **Assessment of Tax:** 15 Lectures
Assessment, Reassessment, Best Judgment Assessment, Income Escaping Assessment, Self Assessment, Scrutiny Assessment, Protective Assessment, Appeals and Revision, Search and Survey.

Unit- IV **Authorities of Income Tax:** 15 Lectures
Income Tax Authorities - Functions of CBDT, DGIT, Chief Commissioner of Income Tax; Powers and duties of Commissioner of Income Tax, Commissioner of Income Tax (Appeals), Additional Director (or Commissioner), Joint Director (or Commissioner), Income Tax Officer, Assistant Director (or Commissioner), Tax Recovery Officer and Inspector.

Reference Books:
1) Singhania, V.K. : Students' Guide to Income Tax, Taxmann Publication, New Delhi

2) Manoharan, T.N. : Direct Taxes : Snow White Publications, New Delhi
3) Singhania, Monica : Students' Guide to Income Tax and GST, Taxmann, New Delhi
4) Sury, M.M. : Goods and Services Tax in India,
5) Agarwal, CA VK : GST Guide for Students, Neelam Book House, Delhi
6) Datey, V.S. : GST Ready Reckoner, Taxmann, New Delhi
7) Thakkar, Vishal : GST for the Layman, TV18Broadcast Ltd.,
8) The Institute of Chartered Accountants of India, Study Material for CA Inter/Final-Taxation

Nature of Question Paper
B.Com (CBCS) Part-III (Semester-VI)
Taxation Paper-III
Discipline Specific Course
(Introduced from June-2020)

Instructions:	i)	All the questions are compulsory.	Total : 40 Marks
	ii)	Figures to the right indicate full marks.	
	iii)	Use of calculator is allowed.	
Question 1		Practical Problem E) 8 Marks F) 8 Marks	16 Marks
Question 2		Attempt Any Two Questions on theory or problems (out of three)	16 Marks
Question 3		Write short notes (Attempt any two out of four)	08 Marks

B.Com (CBCS) Part-III (Semester-VI)
Paper- IV : DSE-D4 : Taxation
Discipline Specific Course

4 Credits

Course Outcomes:
1. To understand the concept of GST
2. To know the procedure of registration under GST
3. To understand the important concepts related to GST
4. To understand the legal framework of GST in India

Syllabus Content

Unit- I	**Basics of GST:** Meaning of GST, Need for GST, Features of GST, Application of GST in India, Rates of GST, Benefits of GST, Charge or Levy of GST.	15 Lectures
Unit- II	**Registration:** Persons liable and not liable for registration under GST, Amendment and Cancellation of GST registration, Exemptions from GST, Goods and Services exempted from GST.	15 Lectures
Unit- III	**Important Concepts under GST:** Input Tax Credit : Meaning, Definition, Eligibility for taking Input Tax Credit Tax Invoice, Debit and Credit Notes : Meaning, Proforma and Amounts to be Indicated Payment of Tax and Return : Procedure of payment of GST and Filing of Returns of GST	15 Lectures
Unit- IV	**Legal Framework of GST in India:** Application of CGST, SGST, IGST and UTGST Acts, Provisions of Levy, Collection, Composite Scheme and Commencement of GST Regime as per various acts	15 Lectures

(Note: Problems shall be asked on Unit 3 and 4 only)

Reference Books:

1) Singhania, V.K. : Students' Guide to Income Tax, Taxmann Publication, New Delhi
2) Manoharan, T.N. : Direct Taxes : Snow White Publications, New Delhi
3) Singhania, Monica : Students' Guide to Income Tax and GST, Taxmann, New Delhi
4) Sury, M.M. : Goods and Services Tax in India,
5) Agarwal, CA VK : GST Guide for Students, Neelam Book House, Delhi
6) Datey, V.S. : GST Ready Reckoner, Taxmann, New Delhi
7) Thakkar, Vishal : GST for the Layman, TV18Broadcast Ltd.,
8) The Institute of Chartered Accountants of India, Study Material for CA Inter/Final-Taxation

Nature of Question Paper
B.Com (CBCS) Part-III (Semester-VI)
Taxation Paper-IV
Discipline Specific Course
(Introduced from June-2020)

Instructions:	i)	All the questions are compulsory.	Total : 40 Marks
	ii)	Figures to the right indicate full marks.	
	iii)	Use of calculator is allowed.	

Question 1		Practical Problem
		  G) 8 Marks
		  H) 8 Marks
			16 Marks

Question 2		Attempt Any Two Questions on theory or problems (out of three)	16 Marks
Question 3		Write short notes (Attempt any two out of four)	08 Marks

(Note: Problems shall be asked on Unit 3 and 4 only)

B.Com-III Semester – V (CBCS)
Paper-I : DSE-F1 : Insurance
(Life Insurance)

Objectives
i) To acquaint the students with the basics of Life Insurance and its procedure
ii) To familiarize the students with the insurable risk and various life insurance products

Unit I: - Introduction to Life Insurance:-
1.1 : Life Insurance -Evolution, Meaning, Definition, Features
1.2 : Human Assets, Principles of Protection and Investment in Life Insurance, Principles applicable to life insurance
1.3 : Socio-Economic significance of Life Insurance, Life Insurance as a social security tool
1.4 : Role of Life Insurance in financial planning, Life insurance needs at various Life stages

(15periods)

Unit II: - Life Insurance Contract & Conditions:-
2.1: Life Insurance Contract –Meaning and Nature, Conditions of valid Life Insurance Contract
2.2 :Procedure of taking life insurance policy, Procedure of settlement of death and maturity claims
2.3 :Policy conditions relating to payment of premium, grace days, surrender value, paid up policy, lapses of policy, revival of lapsed policy
2.4 :Policy conditions relating to nomination and assignment of policy, accident and disability benefits

(15periods)

Unit III: - Life Insurance Risk and Premium:-
3.1 : Meaning and definition of risk, Classification of risk : physical, occupational and

moral, insurable and non-insurable risk

3.2 : Risk to human life, Evaluation of risk, – Factors affecting longevity of a person

3.3 : Calculation of Premium, Steps in calculation of premium, calculation of net single premium for term insurance, whole life insurance and endowment insurance policy, Types of premium, Premium calculation   .

3.4 :Underwriting : Meaning and importance, Non-medical underwriting – Female lives underwriting – Recent Trends in underwriting (15periods)

Unit IV: - Life Insurance Products:-

4.1 : Whole Life Policy : Meaning, features, merits-demerits and types

4.2 :Endowment Policy : Meaning, features, merits-demerits and types

4.3 :Term Assurance, Annuities, Group Insurance (only features & Types)

4.4 :ULIP – Comparison of ULIP with Traditional Insurance–Riders,(15periods)

<mark>**Practical** : Visit the nearest office of life insurance and collect the information of various life insurance policies.</mark>

Reference Books for Paper No. I to IV

1. Insurance Principles and Practice – M.N. Mishra and S.B.Mishra, S. Chand and Co. NewDelhi
2. Principles and Practice of Insurance – M. Motihar, ShardaPustakBhavan, Allhabad
3. Principles of Risk Management and Insurance – Dr. Neelam C. Gulati, Excel Books, NewDelhi
4. Theory and practice of Insurance – M. Arif Khan, Taj Printing Works , Alighar
5. RiskManagementinBankingandInsurance-S.B.Verma,Y.Uppadhyay, R.K. Shrivasatawa, Deep and Deep Publications Pvt. Ltd
6. Insurance Principles and Practice – M.N. Mishra, S. Chand and Co. New Delhi
7. Insurance Theory and practice – NaliniPravaTripathy, Prabir Pal, PHI Learning Pvt Ltd NewDelhi
8. Insurance and Risk Management – Dr. P.K.Gupta, Himalaya Publishing House
9. Insurance Meaning and Its Principles – B.D.Bhargava, Pearl Books New Delhi
10. Insurance Law And Practice – C.L.Tyagi, MadhuTyagi, Atlantic Publishers and Distributers Pvt Ltd
11. General Insurance - S. Balachandran, Insurance Institute of India Mumbai 12.Life Insurance - S. Balachandran, Insurance Institute of IndiaMumbai

Paper-II : DSE-F2 : Insurance
(General Insurance)

Objectives
i) To familiarize the student with the glimpses of fire insurance and motor insurance and their procedural aspects.
ii) To expose the students to the important legal provisions with the respect to IRDAI in general and Fire and Motor insurance in particular

Unit I: - Fire Insurance:-
1.1: Fire Insurance : Meaning of fire and fire insurance, Nature, Physical hazards in fire insurance, Importance of fire insurance
1.2 : Principles of fire Insurance and conditions of fire insurance policy
1.3 :Concepts and difference between Co-insurance & Reinsurance- Methods of Reinsurance, Advantages of Reinsurance, Under-insurance and over-insurance
1.4 : Progress of fire insurance businessin India after privatization   (15Periods)

Unit II: - Fire Insurance Policy and Rating–
2.1: Procedure of taking fire insurance policy, Renewal of fire insurance policy, Settlement of claim under fire insurance
2.2 : Cancellation and forfeiture of fire insurancepolicy.
2.3 : Kinds of fire insurance policy
2.4 : Rating - Rate fixation in Fire Insurance - System, Principles - Theory of Rating – Bases of Rating - Degree of Hazards – Classification of Risk Past loss experience and lawofprobability.   (15Periods)

Unit III:-Basics of Motor Insurance–
3.1 :Meaning, Need, Basic Principles of motor insurance
3.2 :Classification of vehicles under motor insurance, Types of motor insurance policy
3.3 :Procedure of taking Motor Insurance Policy, Settlement of Claim under motor insurance, No Claim Bonus
3.4 :Factors considered for premium rating under motor insurance, Conciliation forum, motor accident tribunal   **(15Periods)**

Unit IV:- Documentation and Legislation –
4.1: Documents in Fire Insurance – Proposal Form, Survey Report, Cover Note, Policy, Endorsement, Renewal Notice, Claim Form.
4.2: Documents in Motor Insurance – ProposalForm,Survey Report, Cover Note, Policy, Certificate of Insurance, Registration Certificate Book, Fitness Certificate and Permit (for commercial vehicle)
4.3: Legislations – Important provisions relating to fire insurance in Insurance Act 1938, Importantprovisionsrelating to Motor Insurance in Motor VehicleAct1988.
4.4 : Insurance Regulatory and Development Authority of India (IRDAI)Act, 1999 : Important provisions   (15Periods)

Practical :
(i) Take survey of properties covered under fire insurance in local community.
(ii) Collect the information of the types of motor insurance policies taken by vehicle owners in local community.

Reference Books for Paper No. I to IV

1) Insurance Principles and Practice – M.N. Mishra and S.B.Mishra, S. Chand and Co. NewDelhi

2) Principles and Practice of Insurance – M. Motihar, ShardaPustakBhavan, Allhabad

3) Principles of Risk Management and Insurance – Dr. Neelam C. Gulati, Excel Books, NewDelhi

4) Theory and practice of Insurance – M. Arif Khan, Taj Printing Works , Alighar

5) RiskManagementinBankingandInsurance-S.B.Verma,Y.Uppadhyay, R.K. Shrivasatawa, Deep and Deep Publications Pvt. Ltd

6) Insurance Principles and Practice – M.N. Mishra, S. Chand and Co. New Delhi

7) Insurance Theory and practice – NaliniPravaTripathy, Prabir Pal, PHI Learning Pvt Ltd NewDelhi

8) Insurance and Risk Management – Dr. P.K.Gupta, Himalaya Publishing House

9) Insurance Meaning and Its Principles – B.D.Bhargava, Pearl Books New Delhi

10) Insurance Law And Practice – C.L.Tyagi, MadhuTyagi, Atlantic Publishers and Distributers Pvt Ltd

11) General Insurance - S. Balachandran, Insurance Institute of IndiaMumbai

12) Life Insurance - S. Balachandran, Insurance Institute of IndiaMumbai

Paper – III :DSE-F3 : Insurance
(Claim Management in Life Insurance)

Objectives
i) To provide the sound understanding to the student about managing the claims under life insurance
ii) To acquaint the students with the life insurance legalization and documents

Unit I : - Life Insurance Agent (Financial Adviser)
1.1 : Life Insurance Agent: Meaning, Procedure for becoming an Agent, Insurance Agency as a Profession, Qualifications & disqualification for Life Insurance Agent
1.2 : Role of an Insurance Agent in distribution of insurance products, Functions of an life insurance Agent
1.3: Code of conduct for life insurance agent, Remuneration of life insurance agent
1.4 : Use of Internet and Intranet means by LIC agent, Benefits of Information Technology to Insurance Agent and Policy holders   **(15periods)**

Unit II: - Life Insurance : Documents and Progress:-
2.1 :Life Insurance documents : Meaning and Importance of LIC documents, Conditions regarding loss of life insurance policy and Indemnity bond
2.2 :Documents for taking out life insurance policy : Proposal form, Medical Examination Report, Agent's Confidential Report, Proof of Age, First premium receipt (Cover note), Renewal Premium Receipt Life Insurance Policy
2.3 :Documents for settlement of claim : Death Certificate, Police Inquest Report, Coroner`s Report, Deed of Assignment, Claim for Discharge form
2.4 :Progress of life Insurance in India since privatization(15 Periods)

Unit III: - Claim Management in Life Insurance
3.1 : Claim Management: Meaning, Need, Classifications of claims : Death claim, Maturity claim, Early claims, Time- barred claims
3.2 :Claim management procedure and system for different types of claim,
3.3 :Calculation of claim,Claim concessions, Presumption of death, Accident   and Disability   benefits
3.4 : Importance of investigation in claim management.   (15periods)

Unit IV: - Life Insurance Legislation & FDI in Life Insurance Sector :
4.1 : Important provisions of Life Insurance Corporation Act 1956,
4.2 :Evolution of Insurance Regulatory and Development Authority (IRDA) of India Act.1999 and important provisions
4.3 :Ombudsman in Life Insurance : Meaning, function and role in grievance redressal
4.4 :Foreign Direct Investment in Life Insurance Sector : Advantages and disadvantages
(15periods)

Practical :
(i) Interact with the life insurance agent and understand his /her role
(ii) Visit the nearest LIC office and collect the information about settlements of claims and settlement rate

Reference Books for Paper No. I to IV
1. Insurance Principles and Practice – M.N. Mishra and S.B.Mishra, S. Chand and Co. NewDelhi
2. Principles and Practice of Insurance – M. Motihar, ShardaPustakBhavan, Allhabad
3. Principles of Risk Management and Insurance – Dr. Neelam C. Gulati,Excel Books, NewDelhi

4. Theory and practice of Insurance – M. Arif Khan, Taj Printing Works ,Alighar
5. Risk Management in Banking and Insurance- S.B. Verma, Y .Uppadhyay, R.K. Shrivasatawa, Deep and Deep Publications Pvt.Ltd
6. Insurance Principles and Practice – M.N. Mishra, S. Chand and Co. NewDelhi
7. Insurance Theory and practice – NaliniPravaTripathy, Prabir Pal, PHI Learning Pvt Ltd NewDelhi
8. Insurance and Risk Management – Dr. P.K.Gupta, Himalaya PublishingHouse
9. Insurance Meaning and Its Principles – B.D.Bhargava, Pearl Books NewDelhi
10. Insurance Law And Practice – C.L.Tyagi, MadhuTyagi, Atlantic Publishers and Distributers Pvt Ltd
11. General Insurance - S. Balachandran, Insurance Institute of IndiaMumbai
12. Life Insurance - S. Balachandran, Insurance Institute of IndiaMumbai

B.Com –III Semester – VI
Paper – IV : DSE-F4 : Insurance
(Marine and Other Insurance)

Objectives
i) To expose the students to the principles, types and conditions of Marine Insurance
ii) To familiarize the students with various documents and legislative provisions of Marine Insurance.
iii) To acquaint the student to various types of Miscellaneous Insurance

Unit I: - Marine Insurance :
1.1 : Marine Insurance : Evolution, Meaning & Definition, Classification,Principles
1.2 : Clauses of Marine Insurance Policy, Warranties: Implied & Expressed Warranties
1.3 : Types of Marine Insurance Policy
1.4 : Procedure for taking Marine Insurance Policy, Payment ofclaim   (15 periods)

Unit II :- Marine Losses and Perils :
2.1 :Marine Losses :Total loss, Partial Loss, Particular Average Loss, General Average Loss
2.2 :Difference between Particular Average Loss & General Average Loss - Salvage Charges – Preparation of loss statement
2.3 :Marine Perils
2.4 :Progress of Marine Insurance businessinIndia.(15periods)

Unit III :- Other Insurance (Only Nature & Cover)
3.1 :Burglary Insurance, Engineering Insurance
3.2 :Crop Insurance, Cattle Insurance
3.3 :Sports Insurance, CatastropheInsurance
3.4 :Aviation Insurance, Export Risk Insurance
        (15periods)

Unit IV :- Documentation and Legislation :-
4.1: Documents in Marine Insurance - Proposal Form,SurveyReport,Cover Note, Policy, Endorsement, Renewal Notice,Claim Form, Bill of Lading, Letter of Subrogation, Copy ofProtest.
4.2 : Important Provisions of Marine Insurance Act1963
4.3 : InsuranceRegulatory and Development Authority Act 1999
4.4 : Foreign Direct Investment in General InsuranceSector
        (15periods)

Practical

i)   Obtain the documents used in marine insurance by visiting nearest branch office of General Insurance Corporation, analyze them and prepare the report.

ii) Obtain the bare Act of IRDA Act 1999 and study its provisions

Reference Books for Paper No. I to IV

1. Insurance Principles and Practice – M.N. Mishra and S.B.Mishra, S. Chand and Co. NewDelhi
2. Principles and Practice of Insurance – M. Motihar, ShardaPustakBhavan, Allhabad
3. Principles of Risk Management and Insurance – Dr. Neelam C. Gulati,Excel Books, NewDelhi
4. Theory and practice of Insurance – M. Arif Khan, Taj Printing Works ,Alighar
5. Risk Management in Banking and Insurance- S.B. Verma, Y .Uppadhyay, R.K. Shrivasatawa, Deep and Deep Publications Pvt.Ltd
6. Insurance Principles and Practice – M.N. Mishra, S. Chand and Co. NewDelhi
7. Insurance Theory and practice – NaliniPravaTripathy, Prabir Pal, PHI Learning Pvt Ltd NewDelhi
8. Insurance and Risk Management – Dr. P.K.Gupta, Himalaya PublishingHouse
9. Insurance Meaning and Its Principles – B.D.Bhargava, Pearl Books NewDelhi
10. Insurance Law And Practice – C.L.Tyagi, MadhuTyagi, Atlantic Publishers and Distributers Pvt Ltd
11. General Insurance - S. Balachandran, Insurance Institute of IndiaMumbai
12. Life Insurance - S. Balachandran, Insurance Institute of IndiaMumbai

B.Com.III
Semester V and VI (CBCS Pattern)
Insurance Paper I to IV
Nature of Question Paper

Instructions: Total Marks: 50

1. All questions carry equal marks
2. Attempt any five questions out of seven

Q.1	Write Short Answers (Any two out of three)	10 Marks
Q.2	Broad Question	10 Marks
Q.3	Broad Question	10 Marks
Q.4	Broad Question	10 Marks
Q.5	Broad Question	10 Marks
Q.6	Broad Question	10 Marks
Q.7	Write Short Notes (Any two out of three)	10 Marks

Equivalence

Sr.No.	Old Name	New Name
1	Insurance Paper - I	Insurance Paper - I
2	Insurance Paper - II	Insurance Paper - II
3	Insurance Paper - III	Insurance Paper - III
4	Insurance Paper - IV	Insurance Paper - IV

B. Com Part III

(CBCS Pattern- 2020-21)

ADVANCED MARKETING

Semester	Paper	Name of Course
Semester V	Paper I	Introduction to Marketing
	Paper II	Marketing Management
Semester VI	Paper III	Service Marketing
	Paper IV	Recent Trends in Marketing Management

B. Com Part III Semester V
Paper I : DSE-G1 : INTRODUCTION TO MARKETING

Course Outcomes:

iii) *To acquaint the students with the basics and advance marketing concepts and its procedure*

iv) *To familiarize the students with Marketing Environment and Consumer Buying Behaviour.*

Unit	Course Contents	Hours
Unit 1	**Introduction to Marketing:** Meaning and Nature of Marketing, Evolution of Marketing Concept, Importance and Functions of Marketing, Objectives and Process of Marketing *Practical: Writing marketing process of any particular product*	**15**
Unit 2	**Modern Marketing:** Difference between Selling and Marketing, Changing Concepts of Marketing, Features of Modern Marketing Concept, Role of Marketing in Economic Development, Relation of Marketing with other functional areas of business. Types of Marketing Organisation *Practical: Study of relation of marketing department with other departments of any business organisation*	**15**
Unit 3	**Marketing Environment and Marketing System:** Micro and Macro Marketing Environment, Forces in Marketing, Environmental Scanning and Analysis, Mapping the Marketing Environment, Marketing System *Practical: Scanning and Analysis of Marketing Environment of any nearest business organisation.*	**15**
Unit 4	**Consumer Behaviour:** Concept of Consumer Behaviour, Need for understanding Consumer Behaviour, Consumer Decision Behaviour, Factors influencing Consumer Buying Behaviour, Buying Motives of Consumers, Consumer Buying Decision Process *Practical: Observing and reporting consumer behaviour at any departmental store or vegetable market or weekly bazzar.*	**15**

B. Com Part III Semester V
Paper II :DSE-G2 : MARKETING MANAGEMENT

Course Outcomes:

    iii) *To familiarize the student with conceptual Marketing Management, its functions and role of Marketing Manager*

    iv) *To expose the students to the understand the Market Segmentation and Marketing Mix*

Unit	Course Contents	Hours
Unit 1	**Marketing Management** Meaning and Nature of Marketing Management, Functions of Marketing Management, Role of Marketing Manager, Qualities of Marketing Manager ***Practical:*** *Draft a report after discussion with marketing manager of any nearest company.*	*15*
Unit 2	**Marketing Planning:** Meaning, Significance and Process of Marketing Planning, Structure of Marketing Plan, Strategic Marketing Planning – Meaning and Process, Competitive Marketing Strategies ***Practical:*** *Preparation of marketing plan for any product*	*15*
U nit 3	**Market Segmentation and Marketing Mix** Concept of Market Segmentation, Requirements of Effective Segmentation, Benefits of Market Segmentation, Methods of Marketing Segmentation, Patterns of Segmentation. Marketing Mix: Meaning, Importance and Elements of Marketing Mix, Determining the Marketing Mix, Factors affecting the Marketing Mix ***Practical:*** *Preparation of marketing mix of any business organisation producing different products.*	*15*
Unit 4	**Management of Marketing Mix:** a) Product Mix: Concept of Product, Product Planning – Significance and factors affecting the Product Planning, b) Price Mix: Significance of Price in Marketing, Objectives of Pricing, Factors affecting Price, Kinds of Pricing Decisions c) Promotion Mix: Meaning, Objectives and Methods of Promotion d) Place (Distribution) Mix: Meaning and Importance of Distribution Channels, Distribution Policies and Strategies ***Practical: Visit to nearest 5 shops for collection of information about any of the above four factors.***	**15**

B. Com Part III Semester VI
Paper III : DSE-G3 : SERVICE MARKETING

Course Outcomes:

1. *To provide the sound understanding to the student about of various sectors of service marketing.*
2. *To acquaint the students with the Service marketing strategy and Supply Chain Management:*

Unit	Course Contents	Hours
Unit 1	***Marketing of Service:*** Introduction, definition, characteristics of services (Intangibility, Inseparability, Heterogeneity, Perishability). Importance of services, distinction between services and goods, Marketing Mix in Service Marketing- Product price, place, Promoting, Service encounters service, personnel issues, emotions and service situations, service profit chain, service recovery and empowerment. ***Practical-*** *Study and prepare chart of various service marketing sectors and share it in the class.*	**15**
Unit 2	***Services Marketing Strategy:*** Overview of Service Marketing Strategy – Concept and Objectives. Strategic Role of Service Marketing. Formulating and implementing Service marketing strategy. Services Strategies- Strategies for Market Leaders, challengers, followers and niche marketers. ***Practical-*** *Visit different service organizations and prepare innovative strategies for promoting service marketing.*	**15**
Unit 3	***Logistics & Supply Chain Management:*** Definition and scope of logistics, key logistics activities, market logistics decision, emerging concepts in logistics. Concept of supply chain management (SCM), need for SCM, advances in SCM. Distribution: 6 C's of distribution. Selection and appointing distributors. ***Practical-*** *Study the logistic and supply chain management of the company's dealer working for. Prepare report and share in the class.*	**15**
Unit 4	***Marketing Service Sectors:*** Concept, Characteristics and strategies for different services- Banking, Insurance, Hotel, transport, tourism and consultancy services ***Service Quality*** - Customer Expectations and Perceptions ***Practical-*** *Prepare a marketing report by visiting service organization situated to your local area.*	**15**

B. Com Part III Semester VI
Paper IV :DSE-G4 : RECENT TRENDS IN MARKETING MANAGEMENT

Course Outcomes:

iv) *To provide the students regarding conceptual information on recent trends in marketing management*
v) *To acquaint the student with concept of MIS, CRM and Green Marketing*
vi) *To familiarize the students with Retail marketing, Agricultural marketing and International marketing.*

Unit	Course Contents	Hours
Unit 1	**Marketing Information System (MIS) and Green Marketing:** *Marketing Information System*-Meaning, definition, Characteristics, scope & procedure MIS. Requirement of Good MIS, Importance of MIS *Green Marketing-* Meaning and importance issues involved in green marketing- social responsibility, pressure of government, competitive pressure cost of profit. Problems of green marketing. Green marketing strategies. *Practical- Visit to nearest corporate /super market and write the MIS and Green Marketing structure by observing the same.*	**15**
Unit 2	**Customer Relationship Management & Retail Marketing:** *Customer Relationship Management (CRM)-*concept, CRM process, measuring CRM, CRM framework, Tangible Components of CRM, CRM in services, CRM in product management, Zero customer defection, customer loyalty, and customer loyalty development strategies. *Retail Marketing:* Introduction to retail, Factors behind the change of Indian Retailing industry- Economic growth, Classification of retailers: Store and Non-store based retailers, Organised and Unorganised Retailing, business models in retail. Careers in Retailing: Employment opportunities, ownership opportunity. *Practical- Visit Big Bazar/ Departmental store and prepare a report on CRM and retail marketing for ascertaining the career opportunity in it.*	**15**
Unit 3	**Agricultural Marketing:** Meaning and scope of agricultural marketing-Market structure, factors influencing marketable surplus. Estimation of marketable and marketed surplus. New trends in agricultural marketing: APEDA, NAFED- Characteristics of a good agricultural marketing system- Promotion of agricultural products. *Practical- Study the nearest APMC functions and prepare report to share in the class.*	**15**
Unit 4	**International Marketing:** Concept of International Marketing and its Environment, Entry Strategies, International organization, Export	

	procedure & documents, Global Strategies, targeting and Positioning, International Marketing mix- Product Design Decisions, Geographic expansion strategic alternatives, New product in Global Market, Global Pricing Strategies, Channel Objectives and constraints, Channel Structure, Advertising decisions in International marketing. **Practical-** Study the concepts of international marketing and understand the export procedure & documents.	**15**

Reference Books:
1. *The Essence of Marketing- Majaro, Simon. Perentice Hall, New Delhi*
2. *Sales Management: Decision, Strategies and Cases- R. R. Still , E.W. Cundiff , N.A.P. Govani, Pearson Education*
3. *Sales and Distribution Management – K.K. Havaldar, V.M. Cavale, Tata McGraw Hill Company*
4. *Professional Sales Management -Anderson, Hair and Bush, McGraw Hill Company*
5. *Sales Management – Rustom Davar*
6. *Marketing Management- Kotler, Keller, Koshy, Jha, Prentice Hall.*
7. *Marketing Management - Ramaswamy,Namakumari, McGraw Hill Education*
8. *Consumer Behaviour – Schiffman and Kanuk , Pearson Publication*
9. *Marketing Management-Pilai, Bhagavati and Kala- S. Chand & Co. Ltd New Delhi*
10. *Consumer Behaviour – David Loudon and Albert Della Bitta., Tata McGraw-Hill.*
11. *Marketing Management- William Stanton.*
12. *Marketing Management- Philip Kotlar.*
13. *Marketing Management – a south Asian perspective: Kotler Phillip, Keller Kevin Lane, Koshy Abraham and Jha Mithileshwar, Pearson.*
14. *Marketing Management – Ramswamy V. S., Namakumari S., Macmillion Publishers India Ltd.*
15. *Marketing Management – Rajan Saxena, Tata McGraw Hill*
16. *Marketing Management: Text and Cases – Tapan Panda, Excel Books*
17. *Marketing – Etzel, Walker B., Stanton W., Pandit A., Tata McGraw Hill.*
18. *Marketing Management - Karunakarn K — Himalaya Publication, New Delhi.*

B.Com. Part-III; SEM-V (CBCS)

Paper-I : DSE-H1 : Advanced Banking (Banking Laws in India)

Credits : 4

Course Outcomes:

1. Learners will be able to explain Regulatory Framework for Banking in India
2. Learners will understand the important laws relating banking sector
3. Learners will apply the knowledge of legal provisions for banking business practices
4. Learners will understand different provisions under cyber Laws

Expected Skills Impartation

4. Ability to apply legal provisions in banking business
5. Ability to understand the legal applications in banking sector
6. Ability to conduct proper banking activities as per legal provisions

Unit No.	Unit Name	Periods
1	**Banking Laws** 1.1. Need and Importance of Banking Laws 1.2. Banking Regulation Act 1949 1.3. New Bank Licensing Policy, 2013 1.4. Provisions for opening and closing of bank branches in India,	15
2	**Banking Laws relating to Cooperative Banks** 2.1. Co-operative Societies Act, 1912 2.2. Maharashtra Co-operative Societies Act, 1960 2.3. Multi State Co-operative Societies Act,2002 2.4. Employees Cooperative Credit Societies- Model Bye-laws in Maharashtra	15
3	**The Negotiable Instrument Act, 1881 and Amendments** 3.1. Meaning, Types, Features and Parties of Bill of Exchange 3.2. Meaning, Features and Parties of Promissory Note 3.3. Meaning, Types, Features and Parties of Cheque 3.4. Protection to a Paying Banker and Collecting Banker	15
4	**Other Laws Relating to Banking** 4.1. Important Provisions under Indian Contract Act, 1872 4.2. Garnishee Order-Meaning, Steps and Execution of Garnishee Order 4.3. Mortgage of Immovable Properties and Its Types 4.4. Banking Ombudsman Scheme 2006	15

References :

1. Arora and Kalra (1999), "All India Banking Law Digest, (1995-1999), Law House Delhi
2. Employees Cooperative Credit Societies - https://sahakarayukta.maharashtra.gov.in
3. ICSI (2015) Banking Law And Practice, https://www.icsi.edu
4. IIBF(2007), "Laws of Co-operative Banking", MacMillan India Ltd.,
5. M.L. Tannan, (2008) Banking Law and Practice in India, India Law House, New Delhi
6. M.L.Tannan, C.R. Datta & S.K. Kataria (2011) Banking Law and Practice, Wadhwa & Company
7. Maharashtra Co-operative Societies Act, 1960 https://sahakarayukta.maharashtra.gov.in

8. Multi State Co-operative Societies Act,2002 https://mscs.dac.gov.in/Guidelines/GuidelineAct2002.pdf
9. RBI (2019) Rationalisation of Branch Authorisation Policy- Revision of Guidelines
    https://rbi.org.in/scripts/NotificationUser.aspx/Mode=0&Id=11570
10. Sudhir Naib, The Information Technology Act, 2005: A Handbook, OUP, New York, (2011)
11. Tannan (2001), "Banking Law & Practice in India" 20/e (Stud. ed), Law House Delhi

B.Com. Part-III; SEM-V (CBCS)

Paper-II : DSE-H2 : Advanced Banking (Retail and Corporate Banking)

Credits : 4

Course Outcomes:

1. Learners will be able to explain Retail and Corporate Banking systems
2. Learners will understand the Retail and Corporate Banking Practices
3. Learners will apply the knowledge in banking business

Expected Skills Impartation

1.   Ability to differentiate Retail and Corporate Banking
2.   Ability to conduct Retail Banking business
3.   Ability to conduct Corporate Banking business

Unit No.	Unit Name	Periods
1	**Introduction to Retail Banking** 1.1. History, definition and concept of Retail Banking and Corporate Banking 1.2. Difference between Retail banking and Corporate banking 1.3. Importance of Retail banking to Indian Economy 1.4. Changing scenario of Retail Banking in India	15
2	**Retail Banking Products** 2.1. Home Loan - Types, Margin and Process of disbursement 2.2. Vehicle Loan - Types, Margin and Process of disbursement 2.3. Gold Loan - Nature and Process of disbursement 2.4. Educational - Nature and Process of disbursement	15
3	**Corporate Banking** 3.1. Need and Importance of Corporate Banking 3.2. Factoring and Forfeiting services 3.3. Infrastructure Finance Companies in India 3.4. Nature and Importance of Import-Export Finance.	15
4	**Investment Banking** 4.1. Meaning, Evolution and Scope of Investment Banking. 4.2. Meaning and Functions of Merchant Banking 4.3. Meaning and Nature of Venture Capital 4.4. Meaning and Importance of Loan Syndications.	15

References :

1.   Indian Institute of Banking and finance (IIBF) (2015) Banking Products and Services, M/s Taxman

Publications Pvt. Ltd
2. Leichtfuss, Reinhold (2003) Achieving Excellence in Retail Banking, John Wiley and sons.
3. Indian Institute of Banking and finance IIBF (2010) International Banking, M/s Macmillan India Limited,
4. Mathav S B. (2013) Financial Management Mac-Millan Publications.
5. Yadhav S. S. (2014) Foreign Exchange Markets (Latest Edition) Mac-Millan Publications.
6. Indian Institute of Banking & finance (2018) Corporate Banking. Mac-Millan Publications.
7. Indian Institute of Banking and finance IIBF (2016)– International Corporate Finance. Mac-Millan Publications.
8. Pratap Giri S. (2017). Investment Banking: Concepts, Analyses and Cases, McGraw-Hill Education.
9. Subramanyam. (2017). Investment Banking: Concepts, Analyses and Cases, McGraw-Hill Education.
10. Ramamurthy Natarajan (2016). Corporate Banking: A Guide Book for Novice, Create Space Independent Publishing Platform.
11. Vikas Srivastava (2017) Project and Infrastructure Finance: Corporate Banking Perspective, Oxford University Press.

B.Com. Part-III; SEM-VI (CBCS)

Paper-IV : DSE-H4 : Advanced Banking (Financial Markets and Services)

Credits : 4

Course Outcomes:

1. Learners will be able to understand the nature and structure of Financial Market in India
2. Learners will understand business practices in money market and capital market
3. Learners will understand functioning of different Intermediaries in Financial Markets

Expected Skills Impartation

1. Ability to understand the procedure of security trading
2. Ability to apply knowledge for security trading
3. Ability to conduct security trading business

Unit No.	Unit Name	Periods
1	**Introduction to Financial Markets in India** 1.1. Structure of Financial System in India 1.2. Meaning and Role of Financial Markets in Economics Development 1.3. Structure of Capital Market - Primary and Secondary Capital Market 1.4. Instruments used in Indian Capital Market	15
2	**Money Market and Capital Market** 2.1. Meaning, Structure and Features of Money Market in India 2.2. Meaning, Structure and Features of Capital Market in India 2.3. Important Intermediaries - Banks, NBFCs and Other 2.4. Financial Instruments of Capital Market in India	15
3	**Capital Market Operations** 3.1 IPO - Meaning, Nature and Grading of IPO 3.2 Pricing of IPO - Fixed Price Issue and Book Building	15

4	**Intermediaries in Financial Markets**	
	3.3 BSE and NSE - History, Management and Indices - Listing of Securities 3.4 Market Orders - Types of Orders for Selling and Buying of Stocks	
4	**Intermediaries in Financial Markets** 4.1. Role of Depository Organization- CDSL and NSDL 4.2. Indian Clearing Corporation Limited (ICCL) 4.3. Credit Rating Agencies- Functions, Institutes and their Rating Symbols 4.4. Progarmmes and Certifications of BSE Institute Ltd and NSE Academy	15

References :

1. Bhole I.M. (2009). Financial Institutions and Market, 5th edition, 2nd reprint in 2009 Tata McGraw Hill.
2. Benson Kunjukunju Et Al. (2012). Financial Markets and Financial Services in India, New Century Publication, New Delhi.
3. Preeti Singh (2016). Investment Management, Himalaya Publishing House Pvt. Ltd.,
4. Pawan Jhabak (2016). Securities Analysis and Portfolio Management, Himalaya Publishing House Pvt. Ltd.,
5. Avadhani V.A. (2016). Security Analysis & Investment Management, Himalaya Publishing House Pvt. Ltd.,
6. Avadhani V.A. (2016). Securities Analysis and Portfolio Management, Himalaya Publishing House Pvt. Ltd.,
7. Braam van den Berg (2015).Understanding Financial Markets & Instruments Academy of Financial Market, https://eagletraders.com/books/afm/afm4.php
8. NSE (2015), Securities Market (Basic) Module, NCFM, National Stock Exchange Of India Limited
9. Michael K. (2002).Credit Rating Methodology, http://www.psnacet.edu.in/courses/MBA/Financial%20services/17.pdf
10. Issue Management, http://www.psnacet.edu.in/courses/MBA/Financial%20services/13.pdf
11. ICCL https://www.icclindia.com
12. BSE Institute Ltd http://www.bsebti.com/
13. NSE Academy - https://www.nseindia.com/education/content/about_ncfm.htm

	B.Com. Part-III; SEM-VI (CBCS) **Paper-III : DSE-H3 : Advanced Banking (Bank Management Practices)** Credits : 4

Course Outcomes:

1. Learners will be able to understand the nature and structure of Financial Market in India
2. Learners will understand business practices in money market and capital market
3. Learners will understand functioning of different Intermediaries in Financial Markets

Expected Skills Impartation

1. Ability to understand the procedure of security trading
2. Ability to apply knowledge for security trading
3. Ability to conduct security trading business

Unit No.	Unit Name	Periods
1	**Administrative Structure of Head Office** 1.1. Importance of Head Office of the Bank 1.2. Administrative Structure of Head Office 1.3. Departments in Head Office and Its Functions 1.4. Duties and Responsibilities of CEO /MD	15
2	**Regional / Zonal Offices of the Bank** 2.1. Importance of Regional / Zonal Offices of the Bank 2.2. Administrative Structure of Regional/ Zonal Offices 2.3. Functions and Role of Regional / Zonal Offices 2.4. Duties and Responsibilities of Regional/ Zonal Manager	15
3	**Bank Branch Management** 3.1. Structure of Branch Office - Small, Medium and Large Bank Branch 3.2. Duties and Responsibilities of Officer Incharge of Deposit Section 3.3. Duties and Responsibilities of Loan and Recovery Officer 3.4. Duties and Responsibilities of Cashier & Role of Branch Manager	15
4	**Banking Business Practices** 4.1. Principles of Banking Business and Its Importance 4.2. Investment Policy of the Bank- SLR and Non-SLR Investment 4.3. Nature and Importance of Internal and Statutory Audit of the Banks 4.4. Nature and Importance of Information and System Audit of the Banks	15

References :
1. George H. Hempel, Donald G. Simonson (2018). Bank Management: Text and Cases, Wiley, 2020 ISBN 0471410918
2. IIBF (2005). General Bank Management : (For Caiib Examinations), Indian Institute of Banking and Finance, Macmillan, 2005
3. Kanhaiya Singh (2013). Commercial Bank Management, Tata McGraw-Hill Education.
4. Peter S. Rose, Sylvia C. Hudgins (2008). Bank Management and Financial Services, McGraw-Hill Education.
5. Timothy W. Koch, S. Scott MacDonald (2014). Bank Management, Cengage Learning.
6. Timothy W. Koch, Steven Scott MacDonald, Vic Edwards, Randall E. Duran (2014). Bank Management: A Decision-Making Perspective, CENGAGE Learning Asia.
7. V.S.P. Rao (1999). Bank Management, Discovery Publishing House, 1999 ISBN 8171415105
8. Guidance Note on Audit of Banks (2018 Edition)- https://www.puneicai.org/wp-content/uploads/Guidance-

Note-on-Audit-of-Banks-2018-Edition.pdf
9. Chitale MM (2018) Bank Audit - Bombay Chartered Accountants' Society-
https://www.bcasonline.org/ContentType/3.%20MChitale.pdf
10. RBI (2018) Checklists for Computer Audit, https://rbidocs.rbi.org.in/rdocs/PublicationReport/Pdfs/33400.pdf
11. Shiva Chaudhari (2017) A Guide to Risk Based Internal Audit System in Banks, Notion Press.

EQUIVALENCE OF THE PAPERS / COURSES

Sr.	Existing title of the Paper	Revised Title of the paper
1	Advanced Banking Paper – I	Advanced Banking P-I (Banking Laws in India)
2	Advanced Banking Paper – II	Advanced Banking P-II (Retail and Corporate Banking)
3	Advanced Banking Paper P-III	Advanced Banking P-III (Bank Management Practices)
4	Advanced Banking Paper P-IV	Advanced Banking P-IV (Financial Markets and Services)

Nature of question paper for B.Com -III Advanced Banking
Semester V & VI (Paper No. I to IV)
Attempt any five questions.
Total marks 40

Q1. Write short answers (any two out of three)   08

Q2. Broad question   08

Q3. Broad question   08

Q4. Broad question   08

Q5. Broad question   08

Q6. Broad question   08

Q7. Write short notes (any two out of three)   08

Paper – I : DSE-I-1 : Rural Economics and Co-operation
(Optional Paper)

Course Outcomes:
1. Learners will be able to understand Rural Economy in India.
2. Learners will understand the correlation between Agriculture and Rural Development.
3. Learners will understand Agricultural productivity in India.
4. Learners will understand Role of Co-operation in Rural Development.

Unit I: - Rural Economy of India (15 Periods)

1.1 Rural Economy: Concept, nature and features

1.2 Importance of Rural Economy

1.3 Indicators of Rural Development

1.4 Problems of Rural Economy

Unit II:- Agriculture Sector and Rural Development (15 Periods)

2.1 Agriculture and Economic Growth

2.2 Peculiar Features of Indian Agriculture

2.3 Importance of Agriculture in Rural Development

2.4 Risk and Uncertainty in Indian Agriculture

Unit III: - Agricultural Productivity in India (15 Periods)

3.1 Agricultural Productivity: Meaning, types and determinants

3.2 Indian Agricultural Productivity

3.3 Causes of Low Agricultural Productivity

3.4 Measures to improve the Agricultural Productivity

Unit IV: - Introduction to Co-operation (15 Periods)

4.1 Co-operation: Meaning, definition and features

4.2 Principles of Co-operation (Manchester-1995)

4.3 Role of Co-operation in Rural Development

4.4 Issues in Cooperative Movement

References:

i) Misra S. K. and V. K. Puri, Indian Economy, Himalaya Publishing Bombay (Latest edition)

ii) Dutt R. and K.P.M. Sundharam, Indian Economy, S. Chand and Company, New Delhi

iii) R.K.Lekhi and Joginder Singh, Agricultural Economics, Kalyani Publishers, New Delhi

iv) K.V. Patel , A.C. Shah and L.D. Mello , Rural Economics, Himalaya Publishing Bombay

v) S.S.Shejal, Impact of Agri based Industries on Rural Economy ABS Publication, Varanasi

vi) T.N.Hajela, Co-Operation, Ane Book Pvt. Ltd. New Delhi

vii) Vijay Kavimandan, Agricultural and Rural Economics (Marathi) Shri. Mangesh Prakashan Nagapur

viii) C.B.Mamoria, Agricultural problems in India, Kitab Mahal New Delhi

ix) Vasant Desai, Rural Economics, Himalaya Publishing Bombay

(Optional Paper)
Paper – II : DSE-I-2 : Rural Economics and Co-operation

Course Outcomes:-

Student will be able to explain –

1. Awareness among the students regarding Rural Industrialization in India.
2. Agro based industries and small scale industries in India.
3. Non-credit co-operation and Rural Indebtedness in India.

Unit I - Rural Industrialization in India (15 Periods)

1.1 Need and concept of Rural Industrialization

1.2 Importance and problems of Agro-based Industries

1.3 Sugar Industry: Importance and problems

1.4 Dairy Industry: Importance and problems

Unit II- Cottage and Small-Scale Industries in India (15 Periods)

2.1 Meaning, features and difference between cottage and small-scale Industries

2.2 Role of Cottage and Small-Scale Industries.

2.3 Problems of cottage and Small-Scale Industries.

2.4 Government policy towards cottage and Small-Scale Industries

Unit III - Rural Indebtedness in India (15 Periods)

3.1 Meaning and nature of Rural Indebtedness.

3.2 Extent of rural indebtedness

3.3 Causes and effects of rural Indebtedness

3.4 Government measures to reduce rural indebtedness

Unit IV - Non-Credit Co-operatives in India (15 Periods)

4.1 Industrial Co-operatives: Types, functions and problems

4.2 Labour Co-operatives: Meaning, functions and problems

4.3 Consumers Co-operative: Types, functions and problems

4.4 Housing Co-operatives: Types, functions and problems

References:

i) Misra S. K. and V. K. Puri, Indian Economy, Himalaya Publishing Bombay (Latest edition)

ii) Dutt R. and K.P.M. Sundharam, Indian Economy, S. Chand and Company, New Delhi

iii) R.K.Lekhi and Joginder Singh, Agricultural Economics, Kalyani Publishers, New Delhi

iv) K.V. Patel , A.C. Shah and L.D. Mello , Rural Economics, Himalaya Publishing Bombay

v) S.S.Shejal, Impact of Agri based Industries on Rural Economy ABS Publication, Varanasi

vi) T.N.Hajela, Co-Operation, Ane Book Pvt. Ltd. New Delhi

vii) Vijay Kavimandan, Agricultural and Rural Economics (Marathi) Shri. Mangesh Prakashan Nagapur

viii) C.B.Mamoria, Agricultural problems in India, Kitab Mahal New Delhi

ix) Vasant Desai, Rural Economics, Himalaya Publishing Bombay

B.Com. Part- III Semester – VI
Paper – III : DSE-I 3 : Rural Economics and Co-operation
(Optional Paper)

Course Outcomes:-

After completion of this course, the student will be able to-

1. Explain the rural resources in India.
2. Identify the problem of rural unemployment.
3. Understand the rural finance and agricultural co-operatives in India.

Unit I - Rural Resources in India (15 Periods)

1.1 Livestock: Concept, present status, importance and problems.

1.2 Poultry: Present status, importance and problems.

1.3 Fishery: Sources, present status, problems.

1.4 Forest Resources and forestry: Features and importance, social forestry.

Unit II - Rural unemployment in India (15 Periods)

2.1 Rural unemployment: meaning and nature

2.2 Types of rural unemployment

2.3 Causes of rural unemployment

2.4 Government programmes to reduce rural unemployment

Unit III - Rural Finance in India (15 Periods)

3.1 Need and sources of rural finance

3.2 Nationalized commercial banks

3.3 Regional Rural Banks

3.4 National Bank for Agriculture and Rural Development (NABARD)

Unit IV- Agricultural Co-operatives in India (15 Periods)

4.1 Co-operative farming: Types, problems and remedies

4.2 Co-operative Processing: Problems and remedies

4.3 Co-operative Marketing: Objectives, functions and problems

4.4 National Agricultural Co-operative Marketing Federation (NAFED): Functions and problems.

References:

i) Misra S. K. and V. K. Puri, Indian Economy, Himalaya Publishing Bombay (Latest edition)

ii) Dutt R. and K.P.M. Sundharam, Indian Economy, S. Chand and Company, New Delhi

iii) R.K.Lekhi and Joginder Singh, Agricultural Economics, Kalyani Publishers, New Delhi

iv) K.V. Patel , A.C. Shah and L.D. Mello , Rural Economics, Himalaya Publishing Bombay

v) S.S.Shejal, Impact of Agri based Industries on Rural Economy ABS Publication, Varanasi

vi) T.N.Hajela, Co-Operation, Ane Book Pvt. Ltd. New Delhi

vii) Vijay Kavimandan, Agricultural and Rural Economics (Marathi) Shri. Mangesh Prakashan Nagapur

viii) C.B.Mamoria, Agricultural problems in India, Kitab Mahal New Delhi

ix) Vasant Desai, Rural Economics, Himalaya Publishing Bombay

B.Com. Part-III Semester – VI
Paper – IV : DSE- I 4 : Rural Economics and Co-operation
(Optional Paper)

Course Outcomes:-

After completion of this course, the student will be able to-

 1. Understand rural infrastructure in India.

2. Explain rural poverty, food problem and food security in India.

3. Understand co-operative financial institutions in India.

Unit I - Rural Infrastructure in India   (15 Periods)

1.1 Importance of infrastructure in rural development

1.2 Rural Electrification: Progress and problems

1.3 Irrigation facilities: Types, sources, progress and problems.

1.4 Transportation and Communication: Types, importance and problems.

Unit II - Rural Poverty in India   (15 Periods)

2.1 Concept and types of rural poverty

2.2 Incidence of rural poverty

2.3 Causes of rural poverty

2.4 Poverty Alleviation Programmes

Unit III - Food Problem and Food Security in India   (15 Periods)

3.1 Food problem: Different aspects of food problem.

3.2 Food Security: Meaning, definition and nature

3.3 Factors in Food Security

3.4 Remedies of Food Security

Unit IV - Co-operative Finance in India   (15 Periods)

4.1 Meaning, Structure and Importance of Co-operative Finance.

4.2 Primary Agriculture Co-operative Credit Society: Functions and problems

4.3 District Central Co-operative Banks: Functions and problems

4.4 State Co-operative Banks: Functions and problems

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References:

i) Misra S. K. and V. K. Puri, Indian Economy, Himalaya Publishing Bombay (Latest edition)

ii) Dutt R. and K.P.M. Sundharam, Indian Economy, S. Chand and Company, New Delhi

iii) R.K.Lekhi and Joginder Singh, Agricultural Economics, Kalyani Publishers, New Delhi

iv) K.V. Patel , A.C. Shah and L.D. Mello , Rural Economics, Himalaya Publishing Bombay

v) S.S.Shejal, Impact of Agri based Industries on Rural Economy ABS Publication, Varanasi

vi) T.N.Hajela, Co-Operation, Ane Book Pvt. Ltd. New Delhi

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viii) C.B.Mamoria, Agricultural problems in India, Kitab Mahal New Delhi

ix) Vasant Desai, Rural Economics, Himalaya Publishing Bombay

EQUIVALENCE OF THE PAPERS / COURSES

Sr.	Existing title of the Paper	Revised Title of the paper
1	Rural Eco. & Co-operation (Optional) Paper -I	Rural Eco. & Co-operation (Optional) Paper -I
2	Rural Eco. & Co-operation (Optional) Paper- II	Rural Eco. & Co-operation (Optional) Paper- II
3	Rural Eco. & Co-operation (Optional) Paper -III	Rural Eco. & Co-operation (Optional) Paper -III
4	Rural Eco. & Co-operation (Optional) Paper -IV	Rural Eco. & Co-operation (Optional) Paper -IV

Nature of Question Paper for B.Com. - III
Subject- Rural Economics and Co-operation

Semester V and VI (Paper No. I to IV)
Attempt any five questions
Total Marks 40

Q1. Write short answers (any two out of three)   08

Q2. Broad question   08

Q3. Broad question   08

Q4. Broad question   08

Q5. Broad question   08

Q6. Broad question   08

Q7. Write short notes (any two out of three)   08

B.Com. Part-III- SEM-V (CBCS)
Paper I : DSE-J 1 : Advanced Statistics
(Mathematical Methods)
(Optional Paper)
Credit -4

Course Outcomes:

After completion of this course, students will be able to:
1. Evaluate a determinant.
2. Obtain the inverse of a matrix using different methods.
3. Explain the use of permutation and combination.
4. Explain the Binomial theorem and its expansion.

Unit 1 Determinant:
Definition, evaluation of determinant of order 2 and 3, properties of determinant (without proof), Examples based on evaluation and properties, Cramer's rule, solution to given system of linear equations of two and three variables by Cremer's rule.   [15 Periods]

Unit 2 Matrix Algebra:
Definition of matrix, Types of matrices, Addition, subtraction and product of two or more matrices, examples on addition, subtraction and product, Inverse of a matrix by adjoint method, Inverse of a matrix by row transformation, examples based on inverse.[15 Periods]

Unit 3 Permutation and Combination:
Concept of permutation, combination, notation, definition, Relation between them, examples based on $^{n}C_r$ and $^{n}P_r$.   [15 Periods]

Unit 4 Binomial Theorem:
Concept and definition of Binomial Theorem, Expansion of $(a + b)^n$, $(a - b)^n$, finding of middle term, r^{th} term and coefficient of rth term in the expansion, Numerical problems.
                                                [15 Periods]

Reference Books
  i) Business Statistics by S.S. Desai
  ii) Business Statistics by G.V. Kumbhojkar
  iii) Introduction to Mathematical Statistics by S.C. Gupta.
  iv) Mathematics & Statistics by Sureanjan Shah
  v) Text book of matrices by Shanti Narayan
  vi) Elements of Statistics, by D. N. Elhance
  vii) Fundamentals of Applied Statistics, by V. K. Kapoor.
  viii) Business Statistics, by G. C. Beri.

B.Com. Part-III- SEM-V (CBCS)
Paper II : DSE-J 2 : Advanced Statistics
(Applied Statistics)
(Optional Paper)
Credit -4

Course Outcomes:
  After completion of this course, students will be able to:
    1. Explain the concept of demography and terms related to it.
    2. Use the life table and mortality table in real life situations.
    3. Understand the concept of hypothesis testing and different tests of hypothesis.
    4. Perform testing of hypothesis for the real-life examples.

Unit 1 Measures of Mortality and Fertility:
Concept of demography, vital events, Different measures to measure birth rates such as i) CBR ii) GFR iii) ASFR iv) TFR. Definition, formula, merits and demerits, example based on these rates. Different measures of mortality i.e. death rates such as i) CDR ii) SDR iii) STDR by direct method, Example based on these rates.   [15Periods]

Unit 2 Measures of Population growth or Reproduction rates:
Limitations/definition of fertility rate, Introduction of measures of population growth, measures such as GRR and NRR, Definition, formulas, merits and demerits of each one, examples based on these measures.   [15Periods]

Unit 3 Life table or Mortality table:
Definition, types of life table, various columns of life table, construction of life table, Examples based on fill in the blanks or total construction when x and l(x) is known. Uses of life table.
    [15Periods]

Unit 4 Testing of Hypothesis:
Definition of Parameter, Statistic, Hypothesis (simple and composite, null and alternative), Critical Region, level of significance, Type– I and Type–II errors.
a) Large sample tests for variables (z test): Test for $\mu = \mu_0$ and $\mu_1 = \mu_2$
b) Large sample tests for proportion: Test for $p = p_0$ and $p_1 = p_2$
c) Student's t test: Test for $= \mu_0$ and $\mu_1 = \mu_2$

d) Chi square test: Chi-square test of independence of two attributes (for $m \times n$ contingency table), derivation of formula for 2×2 contingency table. Examples based on these tests.

e) Snedecore's F test: Test for $\sigma_1^2 = \sigma_2^2$ [15Periods]

Reference Books

    i) Business Statistics by S.S. Desai
    ii) Business Statistics by G.V. Kumbhojkar
    iii) Introduction to Mathematical Statistics by S.C. Gupta.
    iv) Mathematics & Statistics by Sureanjan Shah
    v) Text book of matrices by Shanti Narayan
    vi) Elements of Statistics, by D. N. Elhance.
    vii) Fundamentals of Applied Statistics, by V. K. Kapoor.
    viii) Business Statistics, by G. C. Beri.

B.Com. Part-III- SEM-VI (CBCS)
Paper III : DSE-J 3 : Advanced Statistics
(Probability and Probability distributions)
(Optional Paper)
Credit -4

Course Outcomes:
After completion of this course, students will be able to:
    i) Explain the concept of probability and compute the probability of various events.
    ii) Explain the concept of mathematical expectation and derive it.
    iii) Understand discrete probability distributions in general.
    iv) Understand Binomial, Poisson and Normal distributions

Unit No. 1 Probability
Concept and definitions of various terms used in probability, definition of probability. Examples based on definition. Addition and Multiplication laws of probability (with proof). Bayes theorem (Statement only). Examples on conditional probability and Bayes theorem.
  [15 Periods]

Unit No. 2 Mathematical Expectation
    Definition and examples based on mathematical expectation. Addition and Multiplication theorems on mathematical expectation (with proof). Examples based on these theorems.   [15 Periods]

Unit No.3 Discrete probability distribution
Definition of probability mass function (pmf) distribution function (cdf). Properties of distribution function. Numerical Examples.   [15 Periods]

Unit No. 4 Probability distributions
Binomial, Poisson and Normal distributions: Definition, properties and examples based on these distributions. Mean and variance of binomial and Poisson distributions (with Proof). Poisson distribution as limiting case of binomial distribution (with Proof). Limitations of Binomial distribution. Properties of normal curve. Fitting of Binomial and Poisson Distributions.
                [15 Periods]

Reference Books for paper III:
i) Business Statistics by S.S. Desai, Publisher: Jai-Gouri
ii) Business Statistics by G.V. Kumbhojkar, Publisher: Phadake
iii) Introduction to Mathematical Statistics by S.C. Gupta and V.K. Kapoor Sultan Chand & Sons, Delhi.

B.Com. Part-III- SEM-VI (CBCS)
Paper – IV : DSE-J 4 : Advanced Statistics
(Operations Research)
(Optional Paper)
Credit -4

Course Outcomes:
After completion of this course, students will be able to:
   i) Formulate and solve a linear programming problem.
   ii) Solve transportation problem using various methods.
   iii) Solve assignment problem using Hungerian method.
   iv) Solve Sequencing Problem.

Unit No. 1 Linear Programming Problem
Concept, formulation of Linear Programming Problem (L.P.P.). Solution of L.P.P. by graphical method. Examples based on minimization and maximization of given function.

[15 Periods]

Unit No. 2 Transportation problem
Concept, Mathematical Model, Balanced and Unbalanced Transportation problem (T.P.). Solution of T.P. by i) NWCR method ii) Least cost method, iii) Vogel's method. Examples based on these methods. [15 Periods]

Unit No. 3 Assignment Problem
Concept, Mathematical Model, Balanced and Unbalanced Assignment Problem (A.P.) Hugerian method to obtain solution. Examples by Hungerian method. [15 Periods]

Unit No. 4 Sequencing Problem
Concept of sequencing, sequencing of n jobs through 2 machines, and n jobs through 3 machines. Stepwise procedure. Examples to determine the sequencing and total time required. Also to find Idle time of the machine. [15 Periods]

Reference Books for paper IV
i) Operations Research by S. D. Sharma, Publisher: Kedar Nath.
ii) Operations Research: An Introduction by H A Taha, Publisher: Pearson.
iii) Operations Research: Theory and Application, *J.K. Sharma*, Publisher. Macmillan.

EQUIVALENCE OF THE PAPERS / COURSES

Sr.	Existing title of the Paper	Revised Title of the paper
1	Advanced Statistics Paper I (Mathematical Methods)	Advanced Statistics Paper I (Mathematical Methods)
2	Advanced Statistics Paper II (Applied Statistics)	Advanced Statistics Paper II (Applied Statistics)
3	Advanced Statistics Paper III (Probability and Probability distributions)	Advanced Statistics Paper III (Probability and Probability distributions)
4	Advanced Statistics Paper - IV (Operations Research)	Advanced Statistics Paper - IV (Operations Research)

Nature of question paper for B.Com -III
Semester V & VI (Paper No. I to IV)
Attempt any five questions.
Total marks 40

Q1. Write short answers (any two out of three)   08

Q2. Broad question   08

Q3. Broad question   08

Q4. Broad question   08

Q5. Broad question   08

Q6. Broad question   08

Q7. Write short notes (any two out of three)   08

B.Com Part – III Semester V

Paper-I: DSE-K1: E-Commerce

Course Outcome –

1. **Understanding the basic structure of E-Commerce industry**
2. **Understanding transactional flow in E-Commerce**

Sr No.	Topic	No of Lectures
Unit 1	Introduction to Electronic Commerce • **What is E-Commerce** • **Goals of E-Commerce** • **Functions of E-Commerce** • **Potential of E-Commerce Industry** • **Various e-commerce platforms at present** • **Types of E-Commerce segments (B2C, B2B, C2C etc.)** Practical – Get preliminary information of various E-Commerce companies	15
Unit 2	E-Commerce Framework • **Introduction to E Commerce Structure / Framework** • **Internet** • **e-Commerce Portal / ERP System** • **Warehouse** • **Point of Sale (POS)** • **Payment Gateway** • **Call Centre** • **Data Analytics** • **CRM (Customer Relationship Management)** Practical – Draw Diagram of framework of any e-commerce company based on some practical research	15
Unit 3	Electronic Payment System • **Introduction** • **Modes of Electronic payments (net banking, debit / credit card, payment wallets etc.)** • **Online payment process** • **Security controls** • **Online frauds & cautions to be taken care of** • **Online payment service providers** Practical – Prepare case study paper on online fraud	15

	Online Order Processing	
Unit 4	**Order Intimations** **Shipping & Billing** **Bar Code System** **Shipment Tracking** **Order Dashboard** **Account Settlement** Practical – Visit any online seller and observe order processing activities	15

B.Com Part – III Semester III

Paper-II : DSE-K2 : E-Commerce

Course Outcome –

1. **Understanding the variousfunctions of E-Commerce industry**
2. **Understanding of cyber security threats and remedies**
3. **Understanding of basics of digital marketing**

Sr No.	Topic	No of Lectures
Unit 1	Supply Chain & Warehouse Management • **Packaging of Products** • **Inventory Management – Coding, storage & monitoring** • **Security Controls** Practical – Visit any seller company who sales online and observe the warehouse management systems	15
Unit 2	Digita Marketing Basics • **Various avenues of digital marketing** • **Difference between traditional marketing and digital marketing** • **SEO (Search Engine Optimization)** • **Recent Trends in digital marketing** Practical – Visit any Digital marketing service provider company and interact	15
Unit 3	Cyber Laws & Intellectual Property Rights, Internet Security • **Types of cyber threats (financial, virus, hacking etc.)** • **Introduction to Information Technology Act** • **Importance of Trade Mark, Patents & Copy Right** • **Consequences of Infringement** Practical – Visit any Cyber Law Professional / IPR service provider company and interact	15
Unit 4	CRM (Customer Relationship Management) • **What is CRM** • **Use of Technology for CRM** • **Future of Industry** • **New Marketing Trends** • **Loyalty Programmes** Practical – Make short study on CRM softwares used in the market	15

Reference Books:

1. **Concepts of E-Commerce by Adesh Pandye**
2. **E-Commerce by Sarika Gupta and Gaurav Gupta**
3. **E-Commerce Strategy, Technology and Implementation by Gary Schneider**
4. **The Complete E-Commerce Book by Janice Reynolds**

B.Com Part – III Semester VI

Paper-III : DSE-K3 : E-Commerce

Course Outcome –

4. **Understanding the variousfunctions of E-Commerce ad its technological aspect.**

5. **Understanding of consumer oritented e Commerce and e retailing.**

6. **Understanding of basics of digital marketing**

Sr No.	Topic	No of Lectures
Unit 1	**Internet Concepts & Technologies:** • Concept & evolution of internet • Web technologies – Global Publishing concept, hypertext, • Concepts of URLs, HTPP, HTTPD, Servers, HTML, HTML Forms & CGI gateway services.	
Unit 2	**E-Commerce and its Technological aspect:** • **Developments in Information Technology and ist relavance to E-Commerce** • **The scope of E- Commerce, E- Marketing** • **Benefits and limitations of E-Commerce,** • **Produce a generic framework for E-Commerce.** • **Architectural framework of Electronic Commerce, Web based E Commerce Architecture.** *Practical – Conduct interview of minimus 5 online shop holders and observe their management systems*	15
Unit 3	**Consumer Oriented E- Commerce and E-Retailing:** • **Traditional retailing and e retailing, Benefits of e retailing,** • **Models of e retailing, Features of e retailing.** • **E services: Categories of e-services, Web-enabled services, matchmaking services, Information-selling on the web,** • **E entertainment, Auctions and other specialized services.** • **Business to Business Electronic Commerce** *Practical – identifying customise oriented e-Services and develop models of E-services*	15

Unit -4	Electronic Data Interchange: • **Benefits of EDI, EDI technology, EDI standards, EDI Communications, EDI Implementation, EDI Agreements, EDI Security.** • **Electronic Payment Systems, Need of Electronic Payment System: Study and examine the use of Electronic Payment system and the protocols used, Study Electronic Fund Transfer and secure electronic transaction protocol for credit card payment.** • **Digital economy: Identify the methods of payments on the net – Electronic Cash, cheques and credit cards on the Internet.** *Practical – Conduct Dumy bank transaction and write detail process of Electronic payment system, Fund transfer syste.*	15

Reference Books:

1. Elias. M. Awad, " Electronic Commerce", Prentice-Hall of India Pvt Ltd.

2. RaviKalakota, Andrew B. Whinston, "Electronic Commerce-A Manager's guide", Addison-Wesley. 3. Efraim Turban, Jae Lee, David King, H.Michael Chung, "Electronic Commerce–A ManagerialPerspective", Addison-Wesley.

4. Elias M Award, "Electronic Commerce from Vision to Fulfilment", 3rd Edition, PHI, Judy Strauss, Adel El-Ansary, Raymond Frost, "E-Marketing", 3RDEdition, Pearson Education.

B.Com Part – III Semester VI

Paper-IV : DSE-K4: E-Commerce

Course Outcome –

1. **Understanding the various functions of E-Commerce ad its technological aspect.**
2. **Students able to know the security issues in E-Commerce.**
3. **Understanding of basics of digital marketing**

Sr No.	Topic	No of Lectures
Unit 1	**Website Design and E-Commerce** • **Role of web – site in B2C e-commerce; website strategies & web-site design principles;** • **Push & pull technologies, alternative methods of customer communication.** Multi – Media & E-commerce; push & pull technologies, alternative methods of customer communication	15

Unit 2	**Online Retail Sector:**
	• Analyzing the Viability of Online Firms
	• E-commerce in Action: E- Retailing Business Models
	   • The Service Sector: Offline and Online
	   • Online Financial Services
	   • Online Travel Services
	   • Online Career Services •
	   • **On-Demand Service Companies**
		15

Unit 3	**Security Issues in E-Commerce:**
	   • **Introduction, need and importance**
	   • **Security risks of e-commerce, exposure of resources,**
	   • **Type of threats, sources of threats,**
	   • **Security tools & risk – management approach**
		15

Unit 4	**Ethical, Social and Political issues in E-Commerce:**
	
	   • **Basic Ethical Concepts, Analyzing Ethical Dilemmas, Candidate Ethical principles**
	   • **Privacy and Information Rights: Information collected at E-Commerce Websites, The Concept of Privacy, Legal protections**
	   • **Intellectual Property Rights: Types of Intellectual Property protection, Governance.**
	
	Practical – Prepare case study and project report on ethical, political and social issues E-Conmmerce
		15

Reference Books:1. Elias. M. Awad, " Electronic Commerce", Prentice-Hall of India Pvt Ltd.

2. RaviKalakota, Andrew B. Whinston, "Electronic Commerce-A Manager's guide", Addison-Wesley. 3. Efraim Turban, Jae Lee, David King, H.Michael Chung, "Electronic Commerce–A ManagerialPerspective", Addison-Wesley.

 4. Elias M Award, "Electronic Commerce from Vision to Fulfilment", 3rd Edition, PHI, Judy Strauss, Adel El-Ansary, Raymond Frost, "E-Marketing", 3RDEdition, Pearson Education.

B. Com (CBCS Pattern)Part- III (Semester-V)

Paper IX : Tax Procedure and Practice

Title of paper- GST (CGST, SGST and IGST)

Generic Elective Course

(Credit 4)

Objectives:-   1) To enhance the knowledge of students with latest amendments in GST Law

2) To clarify the technical aspects and provisions in GST Law

Unit- I	GST Returns (Furnishing details of outward supply, Furnishing details of inward supply, First Return, Annual Return, Final Return, matching of Input Tax Credit)- Specimen Forms for the Returns	Periods-20
Unit- II	1) Sec. 35 Accounts and Sec. 36 Records (Period of Retention, Rules for maintenance of Accounts) 2) Sec. 67 Inspection, Search and Seizure (Power of Inspection, Authority for Search and Seizure)	Periods-10
Unit- III	TCS and TDS, Payment of GST (payment of tax, Interest etc.)	Periods- 10
Unit- IV	Basic Problems- Net GST liability, Time of Supply, Value of Supply	Periods- 20

B. Com (CBCS Pattern)Part- III (Semester-VI)

Paper XI : Tax Procedure and Practice

Title of paper- GST (CGST, SGST and IGST)

Generic Elective Course

Credit-4

Objectives:- 1) To enhance the knowledge of students with latest amendments in GST Law

2) To clarify the technical aspects and provisions in GST Law

Unit- I	Refund of GST (Refund of Tax, Interest on delayed refund	Periods-10
Unit- II	1) Assessment- Self Assessment, Provisional Assessment, Summery Assessment, Scrutiny Assessment, Best Judgment Assessment 2) Audit- Sec. 65- Audit by Tax Authorities Sec. 66- Special audit	Periods-10
Unit- III	1) Appeals and Revision (Appeals to appropriate authority, power of revisional authority) 2) Advance Rulings (Authority for advance rulings, application and procedure)	Periods- 20
Unit- IV	Basic Problems- Admissibility of ITC, Calculation of net GST liability, Composition levy	Periods- 20

B.com- III
Semester V and VI (CBCS Pattern)
Tax Procedure and Practice- GST (CGST, SGST and IGST)
Nature of Question Paper

Internal Marks-   10 marks
Shivaji University Exam   40 marks

Instructions:-
1) All question carry equal marks
2) Attempt any Five questions out of Seven

Q. 1	Theory- Short Notes (Any Two out of Four)	08 marks
Q. 2	Theory Broad Question	08 marks
Q. 3	Theory Broad Question	08 marks
Q. 4	Problems	08 marks
Q. 5	Problems	08 marks
Q. 6	Problems	08 marks
Q. 7	Problems	08 marks

Equivalence

Sr. No.	Old Name	New Name
1	Tax procedure and practice GST (CGST, SGST and IGST) paper- IX (Vocational)	Tax procedure and practice GST (CGST, SGST and IGST) paper- IX (CBCS)
2	Tax procedure and practice GST (CGST, SGST and IGST) paper- XI (Vocational)	Tax procedure and practice GST (CGST, SGST and IGST) paper- XI (CBCS)

Reference Books:-
1) A Birds eye view- Jha and Singh
2) GST made simple- Taxman
3) Basics of GST- Taxman
4) GST guide for Students- CA Vivek Agarwal

B. Com (CBCS Pattern) Part III (Semester V)
Paper X : **Tax Procedure & Practice**
Title of Paper – **Customs**
Generic Elective Course

Credit – 4

Objectives : -

1	To impart theorotical knowledge of Basic concepts of customs, import & export.
2	To develop the skills of solving problems of valuation and calculation of custom duties on imported goods.
3	To acquaint students with the term prohibition on import & export in customs.

Unit I	Introduction of Customs, Role in international trade, organization of customs in India, administration & operational authorities.	10 Hours
Unit II	An overview of Customs Act, 1962, Customs Tariff Act, 1975. Kinds of duties - Basic, Protective, CGST, safeguard, Anti-dumping, anti-subsidy, countervailing, NCCD, cess	10 Hours
Unit III	Important terms & definitions - Assessable value, baggage, Bill of Entry, Bill of Export, Dutiable Goods, Foreign Going Vessel, Exporter, Import Manifest, Prohibited Goods, Shipping Bill, Bill of Lading, Import, Importer, Stores, Letter of Credit, FOB, CIF, Goods Prohibition on importation & exportation of goods & it's reasons, Smuggling	30 Hours
Unit IV	Basic problems- Valuation of imported goods, calculation of custom duty	10 Hours

Paper XII : Tax Procedure & Practice
Title of Paper – **Customs**
Generic Elective Course

Credit - 4

Objectives : -

1	To understand the meaning of types & modes of import & export.	
2	To impart theorotical knowledge of import & export clearance procedure of goods in detail.	
3	To enhance the knowledge of students with the practical solutions of computaiton of Baggage.	

Unit I	Import of Goods - Types of import- Free, Restricted, Prohibited types of licenses - Advance, EPCG,DFRC, Modes of import Export of Goods- Types of export, types of Exporter, Modes of export	10 Hours
Unit II	Clearance Procedure of Import & Export Import - For Home Consumption, for warehousing, Ex-bond clearance Export -Procedure & filing of documents, Main, auxiliary & regular	20 Hours
Unit III	Duty Drawback System Meaning of scheme, Sec 74 & sec 75, Rules for drawback, Documents required for claiming drawback, types of duty drawback	10 Hours
Unit IV	Clearance of Baggage Meaning and kinds of baggage, Rules & procedure of import thereof Basic problems on clearance of baggage & calculation of custom duty thereon	20 Hours

	B.Com. Part-III **Semester – V** **(Optional Paper)** **Industrial Management Paper – I** **Subject Code:** **(Factory and Capital Management)**	

	Objectives:-
	  1. To make students familiar with the subject industrial management.
	  2. To expose the students the importance and applicability of industry management.	

	Learning Outcomes
	  1. Understanding the concept Industrial Management.
	  2. Acquaintance with the Work Environment.
	  3. Acquaintance with the Plant Maintenance.
	  4. Acquaintance with Financial Management	

	Teaching Methods: *Lecture, Interactive ICT Based Use of case lets* *Lecture Interactive ICT Based* Discussion Method	
Sr. No	**Content**	**No. of Lectures**

1	**Unit I:-**
	  1.1 Introduction to Industrial Management–
	    Meaning and importance of industrial management.
	  1.2 Introduction to Enterprise Resource Planning (ERP), System Application and Product (SAP)
	  1.3 Factory Location and Plant Layout-
	
	  1.3.1 Factory Location: Meaning of location of factory, factors determining location of factory
	  1.3.2 Plant Layout: Meaning of plant layout Objectives, Importance of plant layout, Factors influencing layout, Types of layout Problems of layout.
		20

2	**Unit II :- Work Environment -**
	  2.1 Meaning
	  2.2 importance of work Environment
	  2.3 Factors affecting work environment,
	    Lighting, Ventilation, Sanitation, noise control and Air conditioning
	  2.4 Quality Circles, **Kaizen, 5 S,**
		20

3	**Unit III :- Plant Maintenance –** 3.1 Concept, Importance	**10**

	3.2 Objectives of good maintenance system 3.3 types of maintenance 3.4Preventive Maintenance 3.5Recent trends in plant maintenance	
4	**Unit IV – Financial Management** 4.1 Concept of financial Management, 4.2 Objective of Financial management 4.3 Importance and Determinants of Capital Management 4.4Sources of finance 4.5Fixed and working capital	**10**
	References for Paper I to IV : 1. L. C. Jhamb: Industrial Management Savitri Jhamb Everest Publishing House, Pune 2. J. K. Jain : Industrial Management\ Kitab Mahal– Agre 3. K. Aswathappa: Production and Operations Management 4. K. ShridharaBhat – Himalaya Publishing House 5. M. E. ThukaramRao: Industrial Management Himalaya Publishing House 6. Lundy J. L. : Effective Industrial Management Eurasia Publishing Co. 7. Srivastava R. M. : Management Policy and Strategic Management Concepts, Skills and Practices 8. Cost Accounting: B. K. Bhar 9. C. B. Mamoria Gankar: Dynamics of Industrial Relations 10. O. P. Khanna: Industrial Engineering and Management 11.KAshwathappa: Human Resource Management, Tata McGraw Hill, New Delhi 12. A. K. Ahuja : Industrial Management, Kalyani Publishers, New Delhi	

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	B.Com. Part-III **Semester – VI** **(Optional Paper)** **Industrial Management Paper – II Subject Code:-** **(Human Resource Management)**

	Objectives: 1. To make students familiar with the subject human resource management. 2. To expose the students the importance and applicability of human resource management.	
	Learning Outcomes: 1. Knowledge about the Human Resource Management 2. Acquaintance with the Human Resource Management 3. Acquaintance with the Employee Training. 4. Acquaintance with - Recent Trends in HRM	
	Teaching Methods: Lecture, Interactive ICT Based Use of case lets. Lecture Interactive ICT Based Discussion Method	
Sr. No	**Content**	**No. of Lectures**
1	**Unit I - Introduction to Human Resource Management-** **1.1** Concept and Nature **1.2** Scope **1.3** Significance **1.4** Objectives **1.5** Functions of HRM. **1.6 Ethical Issues In HRM:** Meaning, Importance and Ethical Issues In HRM	**10**

2	**Unit II – Human Resource Planning (HRP)**
	2.1 Meaning and need for Human resource Planning, Process of HRP Factors affecting HRP
	2.2 Job Analysis, Job Description, Job Specification.
	2.3 Recruitment and selection-
	    2.3.1 Meaning,
	    2.3.2 Sources of recruitment
	    2.3.3 Steps in the scientific selection procedure
	    2.3.4 e- recruitment: Meaning and Advantage
		20

3	**Unit III –**
	Employee Training and Performance Appraisal
	3.1 Employee Training-
	    3.1.1 Meaning
	    3.1.2 Need for training
	    3.1.3 Steps in training
	    3.1.4 Methods of Training
	    3.1.5 Impediments of effective training
	3.2 Performance Appraisal and Merit Rating
	    3.2.1 Meaning
		20

	3.2.2purpose of performance appraisal
	3.2.3 Methods of performance appraisal **3.2.3**Ethics in performance appraisal
	Merit Rating-
	     3.2.4 Meaning
	     3.2.5 Benefits of Merit Rating,
	     3.2.6 Difference between performance appraisal and merit rating		

4	**Unit IV :- Recent Trends in HRM –(Concept and Nature)** **4.1** Employee's brand **4.2**Outsourcing of HR **4.3**e-HRM **4.4** Work Life Balance **4.5**Emotional Intelligence and Talent Management	**10**	
	References for Paper I to IV: 1. L. C. Jhamb : Industrial Management Savitri Jhamb Everest Publishing House, Pune 2. J. K. Jain : Industrial Management\ 3. K. Aswathappa : Production and Operations Management 4. K. ShridharaBhat – Himalaya Publishing House 5. M. E. Thukaram Rao : Industrial Management Himalaya Publishing House 6. Lundy J. L. : Effective Industrial Management Eurasia Publishing Co. 7. Srivastava R. M.: Management Policy and Strategic Management Concepts, Skills and Practices 8. Cost Accounting: B. K. Bhar 9. C. B. Mamoria Gankar : Dynamics of Industrial Relations 10. O. P. Khanna : Industrial Engineering and Management 11.KAshwathappa : Human Resource Management,Tata McGraw Hill, New Delhi 12. A. K. Ahuja : Industrial Management, Kalyani Publishers, New Delhi		

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B.Com. Part-III **Semester - V** **(Optional Paper)** **Industrial Management Paper – III Subject Code:-** **(Production Management)**

	Objectives:
	     1. To make students familiar with the subject industrial management.
	     2. To Expose the students the importance and applicability of industrial management

	Learning Outcomes: Understanding the Meaning concept of Production Management and PPC. Acquaintance with the Productivity. Acquaintance with the Inventory Management Acquaintance with Logistic Management	

	Teaching Methods:
	  1. Lecture, Interactive ICT Based Use of case lets.
	  2. Lecture Interactive ICT Based Discussion Method	

Sr. No	**Content**	**No. of Lectures**

1	**Unit I:- Production Management and Planning and Control (PPC): –**
	1.1 Production Function-
	  1.1.1 Meaning, Concept and Objectives
	  1.1.2 Function of production Management
	1.2 Planning and Control (PPC):
	  1.2.1 Meaning
	  1.2.2 Objectives
	  1.2.3 Importance of production planning and control
	  1.2.4 Techniques of production control Routing, Scheduling, Dispatching and follow up
	  1.2.5 Limitations of PPC.
		20

2	**Unit II :- Productivity -**
	  2.1 Meaning, Importance
	  2.2 Measurement of Productivity
	  2.3 Factors influencing productivity
	  2.4 Methods of improving productivity
	  2.5 ProductionV/s Productivity.
		10

3	**Unit III :- Inventory Management**
	  3.1 Meaning and Objectives of inventory Management
	  3.2 Receipt and issue of material (Bin Card, Store Ledger)
	  3.3 Pricing of material Issues
	    (First In First Out and Last In First Out)
	  3.4 EOQ
	  3.5 ABC Analysis and VED Classifications
	  3.6 **Just in Time (JIT) Production** – Meaning, Techniques and Advantages.
	  3.7 Recent Trends in Inventory Management.
		20

4	**Unit IV :- Logistic Management-** **4.1**Meaning **4.2**Objectives **4.3** Importance of logistic Management, **4.4**Activities of the logistics Management **4.5** Functions-Transportation, Warehousing including Cold Storage Material handling and Packaging. **4.6** Supply chain Management: Meaning, Definition and Importance	**10**
	References 1. L. C. Jhamb: Industrial Management Savitri Jhamb Everest Publishing House, Pune 2. J. K. Jain: Industrial Management\ Kitab Mahal– Agre 3. K. Aswathappa : Production and Operations Management 4. K. Shridhara Bhat – Himalaya Publishing House 5. M. E. Thukaram Rao : Industrial Management Himalaya Publishing House 6. Lundy J. L.: Effective Industrial Management Eurasia Publishing Co. 7. Srivastava R. M.: Management Policy and Strategic Management Concepts, Skills and Practices 8. Cost Accounting : B. K. Bhar 9. C. B. MamoriaGankar : Dynamics of Industrial Relations 10. O. P. Khanna : Industrial Engineering and Management 11.KAshwathappa : Human Resource Management, Tata McGraw Hill, New Delhi 12. A. K. Ahuja : Industrial Management, Kalyani Publishers, New Delhi	

B. Com. Part-III **Semester – VI** **(Optional Paper)** **Industrial Management Paper – IV Subject Code: 16-612** **(Personnel Management)**

Objectives:
    1. To make students familiar with the subject industrial management.
    2. To expose the students the importance and applicability of industry management.

Learning Outcomes:
    1. Knowing the meaning and concept about the Employee Remuneration.
    2. Acquaintance with the Industrial Relations.
    3. Acquaintance with the Employee Safety, Health and Moral
    4. Acquaintance with **HR Accounting**

	Teaching Methods:
	Lecture, Interactive ICT Based Use of case lets.
	Lecture Interactive ICT Based Discussion Method

Sr. No	Content	No. of Lectures
1	**Unit I:- Employee Remuneration –** 1.1 Concepts of remuneration 1.2 Meaning of wages and salary 1.3 Objectives of wage and salary administration 1.4 Factors influencing wage and salary structure and administration 1.5 Methods of wage payment Time rate, Piece rate 1.6 Incentive plans (Halsey, Rowan and Taylor)	**10**
2	**Unit II :- Industrial Relations –** **2.1** Meaning, Objectives and Significance of industrial relations **2.2** The parties to industrial relations **2.3** Factors affecting industrial relations. **2.4** Meaning and Causes of industrial Disputes **2.5** Measures taken by Govt. to prevent Industrial disputes.	**20**
3	**Unit III :- Employee Safety, Health and Moral:** **3.1** Meaning and need of employee safety **3.2** Factors in safety programme Meaning and importance of employee health **3.3** Occupational hazards, risks and diseases **3.4** Protection against health hazards and statutory provisions under The Factories Act, 1948– Health, safety and welfare provisions **3.5** Meaning of employee morale.	**20**
4	**HR Accounting:** 4.1 Meaning, Definition and Objectives 4.2 Advantages of HR Accounting 4.3 Determinants of Human Capital 4.4 Methods of HR Accounting	**10**
	References for Paper I to IV: 1. L. C. Jhamb : Industrial Management Savitri JhambEverest Publishing House, Pune 2. J. K. Jain : Industrial Management\ Kitab Mahal– Agre 3. K. Aswathappa : Production and Operations Management 4. K. ShridharaBhat – Himalaya Publishing House 5. M. E. ThukaramRao : Industrial Management Himalaya Publishing House 6. Lundy J. L. : Effective Industrial Management Eurasia Publishing Co. 7. Srivastava R. M.: Management Policy and Strategic Management Concepts, Skills and Practices 8. Cost Accounting: B. K. Bhar 9. C. B. Mamoria Gankar: Dynamics of Industrial Relations	

| | 10. O. P. Khanna : Industrial Engineering and Management
11.KAshwathappa : Human Resource Management, Tata McGraw Hill, New Delhi
12. A. K. Ahuja : Industrial Management, Kalyani Publishers, New Delhi. | |

SHIVAJI UNIVERSITY, KOLHAPUR.

Accredited By NAAC with 'A' Grade

Revised Syllabus For

Bachelor of Science

Part-II
Botany
CBCS PATTERN

Syllabus to be implemented from

June, 2019 onwards.

A]   **Ordinance and Regulations: (As applicable to Degree Course)**

B]   **Shivaji University, Kolhapur**
      Revised Syllabus For
      Bachelor of Science

1. **TITLE : Subject- Botany**
    Optional under the Faculty of Science

2. **YEAR OF IMPLEMENTATION**:- Revised Syllabi (As per CBCS) will be implemented from June 2019 onwards.

3. **PREAMBLE:-**
    [**Note :-**The Board of Studies should briefly mention foundation, core and applied components of the course/paper. The student should get into the prime objectives and expected level of study with required outcome in terms of basic and advance knowledge at examination level.]

4. **GENERAL OBJECTIVES OF THE COURSE:**
    (as applicable to the Degree concerned)
    Objectives:-
            1)To impart knowledge of Science is the basic objective of education.
            2) To develop scientific attitude is the major objective to make the students open minded, critical, curious.
            3) To develop skill in practical work, experiments and laboratorymaterials and equipments along with the collection and interpretation of scientific data to contribute the science.
            4) To understand scientific terms, concepts, facts, phenomenon andtheir relationships.
            5) To make the students aware of natural resources and environment.
            6) To provide practical experience to the students as a part of thecourse to develop scientific ability to work in the field of research and other fields of their own interest and to make them fit for society.
            7) To The students are expected to acquire knowledge of plant and related subjects so as to understand natural phenomenon, manipulation of nature and environment in the benefit of humanbeings.
            8) To develop ability for the application of the acquired knowledge toimproveagriculture and other related fields to make the country selfreliant and sufficient.
            9) To create the interest of the society in the subject and scientific hobbies, exhibitions and other similar activities.

5. **DURATION**
            The course shall be a full time course.
6. **PATTERN:-**
            Pattern of Examination will be Semester.

7.   FEE STRUCTURE :-
As per Government /University rules.
1. **Refer brochure and prospectus of concern affiliated college/institute to Shivaji University, Kolhapur.**
2. **Other fee will be applicable as per rules and norms of Shivaji University, Kolhapur.**

8.   ELIGIBILITY FOR ADMISSION:
As per guidelines obtained from Shivaji University, Kolhapur by following rules and regarding reservations by Govt. of Maharashtra.

9.   MEDIUM OF INSTRUCTION:
The medium of instruction shall be in English.

10.   STRUCTURE OF COURSE- B. Sc. II Botany

SECOND YEAR   (SEMESTER III/IV)   (NO.OF PAPERS IV)

Sr. No.	Subjects/Papers	Theory	Internal	Total Marks
1.	Paper-V	50	--	50
2.	Paper-VI	50	--	50
3.	Paper-VII	50	--	50
4.	Paper-VIII	50	--	50
	Practical -I			50
	Practical -II			50
	Total			300

11.   SCHEME OF TEACHING AND EXAMINATION:-

[The scheme of teaching and examination should be given as applicable to the course/paper concerned.]

SECOND YEAR - SEMESTER – III/ IV : Botany (Optional)

Scheme of Teaching and Examination

Sr. No.	Subject/Paper	Teaching Scheme (Hrs/Week)				Examination Scheme (Marks)		
		L	T	P	Total	Theory	Term Work	Total
	Semester-III							
1	Paper-V	3	-	-	03	50	--	50
2	Paper-VI	3	-	-	03	50	--	50
	Semester-IV							
3	Paper-VII	3	-	-	03	50	--	50
4	Paper-VIII	3	-	-	03	50	--	50
	Practical- I (annual)	-	-	4	04	-	-	50
	Practical- II (annual)	-	-	4	04	-	-	50
	Total	06	-	08	14	-	-	300

12.   SCHEME OF EXAMINATION :-

- The examination shall be conducted at the end of each term for semester pattern.
- The Theory paper shall carry 50 marks.
- The evaluation of the performance of the students in theory papers shall be on the basis of Semester Examination of 50 marks.
- Question Paper will be set in the view of the /in accordance with the entire Syllabus and preferably covering each unit of syllabi.

13.   STANDARD OF PASSING:-
   As Prescribed under rules & regulation for each degree.

14.   NATURE OF QUESTION PAPER AND SCHEME OF MARKING:
   (Unit wise weightage of marks should also be mentioned)
   Q. 1. Multiple choices questions (10-questions) ---   10 Marks
   Q.2.   Attempt **any two** of the following.
        (Essay type/Broad answer questions) ----   20 Marks
   Q.3. Write short notes (**any four**) ---   20 Marks

15. EQUIVALENCE IN ACCORDANCE WITH TITLES AND CONTENTS OF PAPERS- (FOR REVISED SYLLABUS)

(Introduced from June 2019 onwards)

Old Syllabus (Semester pattern)		Revised Syllabus (Semester pattern)		
Paper No.	Title of Old Paper	Semester No	Paper No.	Title of New Paper
V	Algae, Fungi, Bryophytes and Industrial applications	Semester- III	V	Embryology of Angiosperms
VI	Plant Physiology, Ecology and Horticulture		VI	Plant Physiology
VII	Pteridophytes, Gymnosperm, Angiosperm and Anatomy	Semester- IV	VII	Plant Anatomy
VIII	Cytogenetics and Utilization of Plant Resources		VIII	Plant Metabolism

16. SPECIAL INSTRUCTIONS, IF ANY.

Botany Paper V: DSC C13: EMBRYOLOGY OF ANGIOSPERMS
CREDITS: 2, LECTURE PERIOD: 3 PER WEEK- LECTURE HOURS: 2.4 PER WEEK, MARKS: 50

UNIT	SUB-UNIT	TOPICS	LECTURE PERIOD
1	STRUCTURAL ORGANIZATION OF FLOWER, POLLINATION AND FERTILIZATION		22
	1.a: Organization of flower	1.1: Concept of flower as a modified Shoot, structure of typical flower. 1.2:Structure of typical androecium, Structure of tetrasporangiate anther andpollen grain. 1.3:Structure of typical gynoecium: Structure of a typical ovule, Types of ovules.	10
	1.b: Pollination and Fertilization	1.4: Definition, Types and mechanism in Anemophily (*Zea mays*), Entomophily (*Calotropis*) and Hydrophily (*Vallisneria*) 1.5:Microsporogensis, pollen germination and male gametophyte 1.6:Megasporogenesis,structure of embryo sac: Monosporic (*Polygonum*) and Bisporic (*Allium*), female gametophyte. 1.7: Fertilization: Entry of pollen tube, double fertilization and triple fusion. Significance of double fertilization.	12
2	Embryo and Endosperm Development; Polyembryony and Apomixis		23
	2.a: Embryo and Endosperm Development	2.1:Structure and development of embryo in Monocotyledons. 2.2:Structure and development of embryo in Dicotyledons. 2.3 Development of endosperm, Types of endosperm- Nuclear, Helobial and Cellular	12
	2.b:Polyembryony and Apomixis	2.4:Polyembryony: Introduction, Types of polyembryony- True polyembryony (Cleavage and Adventive), False polyembryony.Causes of polyembryony, Significance of polyembryony. 2.5: Apomixis: Introduction, Causes of apomixes and Types: Gametophytic and Sporophytic, Significance of apomixis.	11
	TOTAL		45

SEMESTER- III
Botany Paper VI: DSC C14: PLANT PHYSIOLOGY
CREDITS: 2, LECTURE PERIOD: 3 PER WEEK- LECTURE HOURS: 2.4 PER WEEK, MARKS: 50

UNIT	SUB-UNIT	TOPICS	LECTURE PERIOD
1	**PLANT WATER RELATIONSHIP AND MINEARAL NUTRITION**		**22**
	1.a: Plant water relationship	1.1: Introduction, Physiological importance of water. 1.2: Water transport process: Mechanism of water absorption: active and passive absorption theories, water transport through xylem and tracheids. 1.3: Transpiration: Definition, Types of transpiration, Mechanism of stomatal movement, Starch-sugar hypothesis, Factors affecting transpiration, Significance of transpiration.	12
	1.b: Mineral nutrition	1.4: Introduction, Macro and Micronutrients 1.5: Criteria of essentiality 1.6: Mineral nutrient uptake- Passive uptake (Diffusion), Activeuptake (Carrier Concept) 1.7:Role and Deficiency Disorders of Macronutrients(P, K, Ca, Mg) and Micronutrients (Fe, Mn) in plants and its recovery.	10
2	**PHOTOSYNTHESIS, GROWTH AND DEVELOPMENT**		**23**
	2.a: Photosynthesis	2.1: Introduction 2.2: Photosynthetic pigments- (Chlorophylls, Carotenoids and Phycobilins) 2.3: Mechanism of Photosynthesis: a) Light reaction- Photolysis of water, Photosystem I and Photosystem II, Electron transport and Photophosphorylation- Cyclic and Non-cyclic. b) Dark reaction: C_3, C_4 and CAM pathways of carbon fixation. 2.4: Significance of photosynthesis	11
	2.b: Growth and Development	2.6: Definition, Region of growth, Phases of growth, growth curve, Grand period of growth. 2.7: Plant growth regulators: Discovery, site of synthesis,Physiological (Practical applications) roles of growth regulators –	12

		Auxins, Gibberellins and Abscisic acid. 2.8: Plant responses to light and temperature – a) Photoperiodism: Concept, Definition, Photoperiodic classification of plants- LDP, SDP, DNP. b) Mechanism of photoperiodism: Photoperiodic induction, perception of stimulus, role of Phytochrome, flowering hormone-Floregin concept, significance of photoperiodism. 2.9: Vernalization: Concept, mechanism, site of vernalization and its significance.	
	TOTAL		**45**

SEMESTER- IV
Botany Paper VII: DSC D13: PLANT ANATOMY
CREDITS: 2, LECTURE PERIOD: 3 PER WEEK- LECTURE HOURS:
2.4 PER WEEK, MARKS: 50

UNIT	SUB-UNIT	TOPICS	LECTURE PERIOD
1	**ORGANIZATION OF HIGHER PLANT BODY AND TISSUES**		**22**
	1.a:Organization of higher plant body	1.1: The Plant organs 1.2: Development of plant body 1.3: Internal organization	10
	1.b: Meristematic and Permanent Tissue	1.4: Meristem: a) Introduction, Characteristics and Classification of meristems based on position b) Theories of structural development- i) Apical cell theory ii) Histogen theory iii) Tunica Corpus theory. 1.5: Permanent tissue: i) Simple tissue- Parenchyma, Collenchyma and Sclerenchyma ii) Complex tissue: Xylem and Phloem 1.6: Types of Vascular bundles	12
2	**PRIMARY AND SECONDARY STRUCTURE OF PLANT BODY AND TISSUE SYSTEMS**		**23**
	2.a: Primary and secondary structure of plant body	2.1: Primary structure of Monocotyledon andDicotyledon root, stem and leaf. 2.2: Normal secondary growth in Dicotyledon root and stem. 2.3: Anomalous secondary growth in *Bignonia* (Dicot.) and *Dracaena* (Monocot.) stem. 2.4 : Periderm and Lenticel	12
	2.b: Tissue systems	2.5 : Epidermal tissue system 2.6: Secretary tissue system 2.7:Mechanical tissue system	11
	TOTAL		**45**

SEMESTER- IV
Botany Paper VIII: DSC D14: PLANT METABOLISM
CREDITS: 2, LECTURE PERIOD: 3 PER WEEK- LECTURE HOURS:
2.4 PER WEEK, MARKS: 50

UNIT	SUB-UNIT	TOPICS	LECTURE PERIOD
1	**ENZYMES AND NITROGEN METABOLISM**		**22**
	1.a: Enzymes	1.1 : Introduction 1.2 : Classification and Nomenclature of enzymes 1.3 : Structure and properties of enzymes 1.4 : Mechanism of enzyme action- Lock and Key hypothesis and Induced fit hypothesis. 1.5: Factors affecting enzyme activity- temperature and pH. 1.6: Enzyme inhibition	12
	1.b: Nitrogen Metabolism	1.7: Introduction 1.8: Biological Nitrogen Fixation- Asymbiotic and Symbiotic 1.9: Mechanism of Nitrogen Fixation 1.10: Nitrate reduction 1.11: Ammonia assimilation 1.12: nif genes	10
2	**RESPIRATION, SEED DORMANCY AND GERMINATION**		**23**
	2.a: Respiration	2.1: Introduction 2.2:Types of respiration 2.3:Glycolysis 2.4: Formation of Acetyl Co A 2.5: TCA cycle 2.6: ETS in mitochondria 2.7: Fermentation	12
	2.b: Seed Dormancy and Germination	2.8: Concept of dormancy 2.9: Causes of dormancy 2.10: Methods of breaking of seed dormancy. 2.11: Seed germination- Introduction and types (Epigeal, Hypogeal and Viviparous). 2.12: Factors affecting seed germination 2.13: Biochemical changes during seed germination.	11
	TOTAL		**45**

PRACTICALS IN BOTANY
B.Sc. Part – II
(To be implemented from June 2019)

Botanical excursions –

One teacher along with a batch not more than 20 students is taken for Botanical excursions to places of botanical interest, one in each term. If there are female students in a batch of sixteen, one additional lady teacher is permissible for excursion. Each excursion will not be more than 3 days during college working days. T.A. and D.A. for teachers and non teaching staff participating in the excursions should be paid as per the rules. The tour report duly certified by the concerned teacher and the head of the department should be submitted at the time of practical examination.

Details of Practical Examination

B. Sc. II Botany Practical – I and II are to be covered in 25 practicals each. These practicals are to be performed by the students. Each practical is to be supplemented by permanent slides, preserved / fresh specimens / materials, charts, herbarium sheets, wherever necessary.

Every candidate must produce a certificate from Head of the Department in his / her college stating that he / she has completed practical course in a satisfactory manner as per the lines laid down by academic council on the recommendations of Board of Studies in Botany. The student should record his / her observations and report of each experiment should be written in the Journal.

The Journal is to be signed periodically by teacher in charge and certified by Head of the Department at the end of the year. Candidates have to produce their certified journal and tour reports at the time of practical examination. A candidate will not be "**allowed to appear**" for the practical examination without a certified journal, otherwise a candidate must produce a separate certificate of his / her regular attendance for practical course and completion of the same signed by the concerned teacher and Head of the Department.

Total Marks for practical 100 Marks
a) Practical – I - 50 Marks
b) Practical – II - 50 Marks

The practical course is to be covered in 50 practicals .The practical course should be divided into practical no. I which will comprise 25 practicals based on Paper No. V & Paper No.VI where as the practical No. II will comprise 25 practicals based on Paper No.VII & VIII. The practical No I will carry 50 marks & practical II will also carry 50 marks. The practical examination will be conducted at the end of semester IV on two successive days.

Each practical examination (Practical I and II) should be of maximum 5 hours duration and shall test a candidate in respect of following –

i. Identification and preparation of temporary and permanent slides.
ii. Practical study of external and internal structures of different plants as per the syllabus.
iii. Understanding of principles of the experiments.
iv.Identification and setting of Physiological experiments.
v. Recording of observations and conclusions.
vi. Identification and understanding of the practicals conducted with respect to development of plants.
vii. Spotting of the specimens as per the syllabus.
viii. Submission of the tour report.

Practical- I

1) Study of structure of stomata and determination of stomatal density.

2) Study of stomatal and cuticular transpiration by cobalt chloride paper method.

3) Study of role and deficiency symptoms of P, K, Ca, Mg.

4) Estimation ofChlorophylls by Colourometric / Spectrophotometric method.

5) Separationof photosynthetic pigments by ascending paper chromatography.

6) Study of Kranz leaf anatomy in C_4 plants.

7) Estimation of TAN value in CAM plants.

8) Analysis of vegetative growth (any suitable method).

9) Effect of different concentrations of Auxins (IAA) on seed germination (any suitable dicot seeds).

10) Effect of different concentrations of Gibberellic acid (GA) on seed germination (any suitable monocot seeds).

11) Study of evolution of oxygen during photosynthesis.

12) Study of effect of light intensity on photosynthesis.

13) Demonstration of ascent of sap in plants (*Impatiens* sp. and *Polyanthus tuberosa*).

14) Detection of Calcium, Phosphate, Potassium and Iron in the plant tissue by biochemical tests.

15) Demonstration of Endo-osmosis and Exo-osmosis.

16) Determination of sugar percentage by hand refractometer.

17) Study of permeability of plasma membrane by using different concentrations of organic solvent.

18) Study of typical flower and its parts (floral whorls with their functions).

19) Study of young / mature anther by permanent slide.

20) Study of germination of pollen grains.

21) Detection of pollen fertility by staining technique.

22) Study of types of ovules (by permanent slide or photograph).

23) Study of dicotyledon and monocotyledon embryo (by permanent slide or photograph).

24) Dissection of embryo / endosperm from developing seeds (*Grevellia* /*Cucumis*).

Practical- II

1) Study of shoot and root apex by permanent slides.
2) Study of simple tissues.
3) Study of complex tissues.
4) Study of primary structure of dicot and monocot root
5) Study of primary structure of dicot and monocot stem
6) Study of normal secondary growth in dicot stem (*Annona* / *Moringa* / Sunflower) by temporary double stained preparation.
7) Study of anomalous/abnormal secondary growth in *Bignonia* (Dicot stem).
8) Study of anomalous/abnormal secondary growth in *Dracaena* (Monocot stem).
9) Study of periderm and lenticels (by permanent slides)
10) Double stained permanent micro preparation of any suitable material.
11) Study of anatomy of porous (ring porous & diffused porous) and non porous wood.
12) Maceration technique.
13) Study of Epidermal tissue system.
14) Study of Mechanical tissue system.
15) Study of Secretary tissue system.
16) Study of following anatomical peculiarities viz., arenchyma, sunken stomata, multiple epidermis, stellate hairs, glandular hairs, nectories, I-girdles.
17) Study of excretory products viz., Cystolith, Sphaeroraphides, Raphides in plants.
18) Determination of rate of respiration during seed germination by Ganong's respirometer.
19) Breaking of seed dormancy by mechanical and chemical scarification.
20) Study of effect of pH on Catalase enzyme activity.
21) Study of effect of temperature on Malate dehydrogenase enzyme activity.
22) Janus green B staining technique for mitochondria.
23) Demonstration of fermentation.
24) Study of biofertilizers.
25) Separation of Amino acids by Thin Layer chromatography.

Plant Physiology and Metabolism

1. Hopkins, W. G. 1995. Introduction to Plant Physiology. John Wiley & Sons, Inc., New York, USA.

2. Moore, T. C. 1989. Biochemistry and Physiology of Plant Hormones. (2nd edition). Springer – Verlag, New York, USA.

3. Salisburry, F.B. and Ross, C. W. 1992. Plant Physiology. (4th edition). Wadsworth Publishing Co., California, USA. 19

4. Taiz, L. and Zeiger, E. 1998. Plant Physiology. (2nd edition) SinauerAssociates, Inc., Publishers, Massachusetts, USA.

5. R.C. Grewal – Plant Physiology. Campus Books International 483/24, Prahiad street Ansari Road, Darya ganj, New Delhi – 110002.

6. V.K. Jain – Fundamentals of Plant Physiology. S. Chand & Company Ltd. Ramnagar, New Delhi – 110055.

7. Salisbury Ross – Plant Physiology. CBS, Publishers & Distributions 485/ Jain Bhawan, Bhole Nath Nagar, Shahdara, New Delhi – 110032.

8. Devlin & Witham – Plant Physiology. CBS Publishers & Distributors 485, Jain Bhavan, Bhole Nath Nagar, Shahdara, New Delhi – 110032.

9. G. Ray Noggle / G. Fritz- Introductory Plant Physiology. Prentice Hall of India Ltd. New Delhi – 110001.

10. V.Verma. Text Book of Plant Physiology. Emkay Publications., B-19, East KrishnaNagar, Delhi-1100051.

11. V.I. Paladin. Plant Physiology. Arihant Publishers. Jaypur, (India)

12. Dr. S. Sundara rajan- Physiology of Transport in Plants. Anmol Publications, Pvt. LTD. New Delhi.110002.

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14. Bidwell, R.G.S. 1974. Plant Physiology. Macmillan P ub. Co., N.Y.

15.Devlin, R.M. and F.H. Witham. 1983. Plant Physiology. Willard Grant Press. U.S.A.

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18. Pandey, S.N. (1991): Plant Physiology, Vikas Publishing House (P) Ltd., New Delhi, India.

19. Verma, V. (2007): Text Book of Plant Physiology. Ane Books India, New Delhi.

20. Nobel, P.S. 2009. Physicochemical and Environmental Plant Physiology.4th edition Academic Press, UK

21. Taiz, L. and Zeiger, E. 2006. Plant Physiology. 4th Edition. Sinnauers Associates, Saunders land, Massachusetts, USA

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23. Kirkham, M.B. 2004. Principles of Soil and Plant Water Relations. Elsevier, Amsterdam, Netherlands.

24. Dennis, D.T., Turpin, D.H., Lefebvre, D.D. and Layzell, D.B. 1997. Plant Metabolism. 2nd Edition. Longman Group, U.K.

25. Fitter, A. and Hay, R.K.M. 2001. Environmental Physiology of Plants. Academic Press, UK.

26. Emil Tmog, Mineral Nutrition of Plants. Oxford and IBH Publishing House, Bombay/ New Delhi.

27.S. Sundara rajan- Plants Physiology. Anmol Publications, Pvt. LTD.New Delhi.110002.

Angiosperm Anatomy and Embryology

1. P.C. Vashista. - Plant Anatomy. Pradip Publications, Opposite Sitla mandir, Jalandhar-144008.
2. B.P.Pandey - Plant Anatomy. S.Chand & Company,LTD. Ram Nagar, New Delhi.110055.
3. A.C.Datta. - Botany For Degree Students. Press-Delhi, Bombay, Madrass
4. Carlquist, S. 1998.- Comparative Wood Anatomy: Systematic, Ecological and Evolutionary Aspects of dicotyledonous Wood.Springer – Verlag, Berlin.
5. Culter, E.G. 1969. Part I.- Cells and Tissues. Edward Arnold, London.
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9. Lyndon, R.F. 1990. - Plant Development: The Cellular Basis. Unwin Hyman, London.
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20. Pijush Roy. Plant Anatomy. New Central Book Agency Ltd, Kolkata
21. Pandey S N and Ajanta Chadha. Plant Anatomy and Embryology.Vikas Publishing House,Pvt, Ltd, New Delhi
22. Bhojwani S S and Bhatnagar S P. An Embryology of Angiosperms.
23. Maheshwari P. An introduction to Embryology of Angiosperms.
24. Nair P K K. Essentials of Palynology.
25. S. C. Datta. Systematic Botany. New Age International Publishers, New Delhi. (2015).

SHIVAJI UNIVERSITY, KOLHAPUR.

Accredited By NAAC with 'A' Grade

Revised Syllabus For

Bachelor of Science (B.Sc.) Part III

Botany

CBCS PATTERN

Syllabus to be implemented from

June, 2020 onwards

Paper –IX, X, XI, XII - (Semester- V)

and

Paper –XIII, XIV, XV, XVI - (Semester-VI)

A] **Ordinance and Regulations: (As applicable to Degree Course)**

B] **Shivaji University, Kolhapur**
   Revised Syllabus For Bachelor of Science

1. **TITLE : Subject- Botany**
   Optional under the Faculty of Science

2. **YEAR OF IMPLEMENTATION**: - **Implemented from June 2020 onwards.**

3. **PREAMBLE:-**
   [**Note:-**The Board of Studies should briefly mention foundation, core and applied components of the course/paper. The student should get into the prime objectives and expected level of study with required outcome in terms of basic and advance knowledge at examination level.]

4. **GENERAL OBJECTIVES OF THE COURSE:**
   (As applicable to the Degree concerned)
Objectives:-
   1) To impart knowledge of Science is the basic objective of education.
   2) To develop scientific attitude is the major objective to make the students open minded, critical, curious.
   3) To develop skill in practical work, experiments and laboratory materials and equipments along with the collection and interpretation of scientific data to contribute the science.
   4) To understand scientific terms, concepts, facts, phenomenon and their relationships.
   5) To make the students aware of natural resources and environment.
   6) To provide practical experience to the students as a part of the course to develop scientific ability to work in the field of research and other fields of their own interest and to make them fit for society.
   7) To The students are expected to acquire knowledge of plant and related subjects so as to understand natural phenomenon, manipulation of nature and environment in the benefit of human beings.
   8) To develop ability for the application of the acquired knowledge to improve agriculture and other related fields to make the country self reliant and sufficient.
   9) To create the interest of the society in the subject and scientific hobbies, exhibitions and other similar activities.

5. **DURATION**
      The course shall be a full time course.
6. **PATTERN:-**
      Pattern of Examination will be Semester.

7. **FEE STRUCTURE :-**
   As per Government /University rules.
   1. Refer brochure and prospectus of concern affiliated college/institute to Shivaji University, Kolhapur.
   2. Other fee will be applicable as per rules and norms of Shivaji University, Kolhapur.

8. **ELIGIBILITY FOR ADMISSION:**
   As per guidelines obtained from Shivaji University, Kolhapur by following rules and regarding reservations by Govt. of Maharashtra.

9. **MEDIUM OF INSTRUCTION:**
   The medium of instruction shall be in English.
10. **STRUCTURE OF COURSE- B. Sc. III Botany (Optional)**

THIRD YEAR (SEMESTER V/VI) (NUMBER OF PAPERS VIII)

Sr.No.	Subjects/Papers	Theory	Internal	Total Marks
1.	Paper-IX	40	10	50
2.	Paper- X	40	10	50
3.	Paper -XI	40	10	50
4.	Paper- XII	40	10	50
5.	Paper- XIII	40	10	50
6.	Paper-XIV	40	10	50
7.	Paper-XV	40	10	50
8.	Paper-XVI	40	10	50
	Practical -I			50
	Practical- II			50
	Practical- III			50
	Practical -IV			50
	Total			600

11. Structure of B. Sc. III P Semester V and VI

SEMESTER V							
Sr. No.	Subject Title	TEACHING SCHEME			PRACTICAL		
		Credits	No. of Lectures	Hours	Credits	No. of Lectures	Hours
1	**DSE-E**	2	3	2.4	8	20	16
2	**DSE-E**	2	3	2.4			
3	**DSE-E**	2	3	2.4			
4	**DSE-E**	2	3	2.4			
	TOTAL	**10**	**16**	**12.8**	**8**	**20**	**16**
SEMESTER VI							
1	**DSE-F**	2	3	2.4	8	20	16
2	**DSE-F**	2	3	2.4			
3	**DSE-F**	2	3	2.4			
4	**DSE-F**	2	3	2.4			
	TOTAL	**10**	**16**	**12.8**	**8**	**20**	**16**
	GRAND TOTAL	**20**	**32**	**25.6**	**16**	**40**	**32**

12. SCHEME OF EXAMINATION :-

- The examination shall be conducted at the end of each term for semester pattern.
- The Theory paper shall carry 40 marks.
- The evaluation of the performance of the students in theory papers shall be on the basis of Semester Examination of 40 + **10** marks.
- Question Paper will be set in the view of the /in accordance with the entire Syllabus and preferably covering each unit of syllabi.

13. STANDARD OF PASSING:-

As Prescribed under rules & regulation for each degree.

14. **NATURE OF QUESTION PAPER AND SCHEME OF MARKING:**

(Unit wise weightage of marks should also be mentioned)

Q. 1. Multiple choices questions (8-questions) ---   08 Marks

Q.2. Attempt **any two** of the following.

    (Essay type/Broad answer questions) ----   16 Marks

Q.3. Write short notes (**any four**) ---   16 Marks

15. EQUIVALENCE IN ACCORDANCE WITH TITLES AND CONTENTS OF PAPERS- (FOR REVISED SYLLABUS)

(Introduced from June 2020 onwards)

Old Syllabus (Semester pattern)		Revised Syllabus (Semester pattern)		
Paper No.	Title of Old Paper	Sem. No	Paper No.	Title of New Paper
IX	Biology of Non Vascular Plants and Paleobotany	V	**DSE –E25**	Genetics and Plant Breeding
X	Genetics and Analytical Techniques in Plant Science		**DSE –E26**	Microbiology, Plant Pathology and Mushroom Culture Technology
XI	Fundamentals of Plant Physiology and Ecology		**DSE –E27**	Cytology and Research Techniques in Biology
XII	Plant Biochemistry		**DSE –E28**	Horticulture and Gardening
XIII	Biology of Vascular Plants	VI	**DSE –F25**	Plant Biochemistry and Molecular Biology
XIV	Microbiology and Plant Pathology		**DSE –F26**	Bioinformatics, Biostatistics and Economic Botany
XV	Plant Breeding, Biostatistics, Ethnobotany and Horticulture		**DSE –F27**	Plant Biotechnology and Paleobotany
XVI	Molecular Biology and Biotechnology		**DSE –F28**	Bio fertilizers and Herbal Drug Technology

B.Sc. Part- III Botany
CREDITS: 2, LECTURE PERIOD: 3 PER WEEK, MARKS: 40+10
Paper- IX DSE –E25
Genetics and Plant Breeding

Unit 1: Mendelism: **10**

1.1 Introduction, Definition and Basic terminologies in genetics.

1.2 Principles of inheritance a) Law of Dominance b) Law of Segregation c) Law of independent assortment.

1.3 Gene Interaction-a) Complementary gene interaction b) Supplementary gene interaction.

Unit 2 : Linkage and Recombination   **10**

2.1 Linkage: Definition, Linkage group, Types, Coupling and Repulsion phase, Significance.

2.2 Recombination (Crossing over): Definition, Types , Mechanism of crossing over, Significance

2.3 Mutation – Definition, Spontaneous and Induced mutation. Types of mutagen Physical and Chemical, Significance.

Unit 3: Chromosomes structure and Variation

3.1 Chromosome structure - Introduction,   types (based on position of centromere)   **13**

3.2 Multiple allelism: Introduction, Definition, Self-incompatibility in plants

3.3 Quantitative inheritance: a) Polygene inheritance- Concept, examples- Kernel colour in wheat,

      b) Population genetics- Hardy-Weinberg's law.

3.4 Maternal inheritance- Mendelian versus cytoplasmic inheritance, Plastid inheritance in

     Mirabilis jalappa.

3.5 Alternation in genetic make-up and its significance-

     a) Change in chromosome structure- Deletion, Duplication, Inversion and Translocation.

     b) Change in chromosome number- Euploidy and Aneuploidy.

Unit 4: Plant Breeding   **12**

4.1 Introduction, Definition of plant breeding.

4.2 Aims and objectives of plant breeding

4.3 Methods of plant breeding-

     a) Introduction and acclimatization

     b) Selection- i) Mass selection ii) Pure line selection iii) Clonal selection

     c) Hybridization techniques in self and cross pollinated crops.

     d) Male sterility and its significance

     e) Mutation breeding- Gamma garden

B.Sc. Part- III Botany
CREDITS: 2, LECTURE PERIOD: 3 PER WEEK , MARKS: 40+10
Paper- XDSE –E26
Microbiology, Plant Pathology and Mushroom Culture Technology

Unit 1: Microbiology   **10**

1.1 Micro organisms in biological world, characteristic features of different groups:

   Phytoplasma and Actinomycetes

1.2 Methods in Microbiology**:** Staining for microbes**:** Bacteria**,** Sterilization Methods,

Culture Media, Pure Culture Techniques

1.3 Recombination in Bacteria: Transformation and Transduction

Unit 2: Industrial Microbiology   **10**

  2.1 Applications of micro-organisms with reference to Synthesis of

   Antibiotics (Penicillin), Organic Acids (Lactic Acid), Alcohol (Ethyl Alcohol)

  2.2 Bio-pesticides- Concept, Types and Significance

Unit 3: Plant Pathology   **15**

3.1 Classification of Plant Diseases: on the basis of Pathogens and Symptoms

3.2 Transmission of Pathogen- Air borne, Seed borne and Soil borne

3.3 Prevention and Control: Physical, Chemical and Biological Control, Role of Quarantine

3.4 Study of Plant Diseases-

   i)   Grassy Shoot of Sugarcane (Phytoplasma),

   ii)   Citrus Canker (Bacterial),

   iii) Yellow Vein Mosaic of Bhendi (Viral),

   iv)   White Rust of Crucifers and Tikka Disease of ground nut (Fungal)

Unit 4: Mushroom Technology   **10**

4.1. History, Types of Mushrooms: Edible (Non poisonous) and inedible (Poisonous).

4.2 Cultivation Technology:

Pure culture: Medium, Sterilization, Preparation of spawn, Multiplication, Mushroom bed preparation,

factors affecting the mushroom bed preparation and composting technology in mushroom production.

4.3 Storage: Short Term (Refrigeration), Long Term Storage (Canning, Pickles, Papads), Drying

   in Salt Solutions

4.4 Values of Mushroom: Nutrition - Proteins - amino acids, mineral elements nutrition - Carbohydrates, Crude fibre content - Vitamins.

B.Sc. Part- III Botany
CREDITS: 2, LECTURE PERIOD: 3 PER WEEK , MARKS: 40+10
Paper- XI DSE –E27
Cytology and Research Techniques in Biology

Unit 1: Cell as a unit of life   10

I.1 Introduction, The Cell Theory, Prokaryotic and Eukaryotic cells,

1.2 Cell cycle and Apoptosis.

1.3 Cell division: Mitosis and Meiosis with their significance.

Unit 2: Cell Organelles   12

2.1 Nucleus: Ultra structure, Nuclear envelope, Nuclear pore complex, DNA packaging in

 Eukaryotes.

2.2 Mitochondria: Ultrastructure, semiautonomous body and Role.

2.3 Chloroplasts: Ultrastructure, semiautonomous body and Role.

2.4 Ribosomes: Structure and Functions of Prokaryotic and Eukaryotic ribosome.

Unit 3: Sub Cellular Structures and Cell Membrane   10

3.1. ER, Golgi body and Lysosomes: Structure and Role,

3.2 Peroxisomes and Glyoxysomes: Structure and Role.

3.3 Cell membrane: Structure, Fluid Mosaic Model, Role.

3.4Types of membranes as per permeability.

Unit 4: Research Techniques in Biology   13

4.1 Principles of microscopy, Light, Fluorescence and Electron microscopy (EM)-

 Scanning EM.

4.2 Colorimetry, Spectrophotometry, Micrometry, Photomicrography,

4.3 Intellectual property right (IPR) – Concept and Importance.

4.4 Patents – Objectives, Procedure and Working

Paper- XII DSE–E28
Horticulture and Gardening

Unit 1: Importance and divisions of Horticulture   **5**

1.1: Introduction and importance of horticulture

1.2: Divisions of Horticulture – Pomology, Olericulture, Floriculture, Landscape gardening,

Unit 2: Horticultural Produce and Management of Pest and diseases   **10**

2.1: Floriculture: a) Introduction, Cultivation of important cut flowers and management of important

pests and diseases: Rose, Gerbera and Marigold.

       b) Flower arrangements, Packing and Marketing of cut flowers.

2.2: Fruit preservation technology:

a) Physical - Drying, freezing, heat,

 b) Chemical - sugar, salt, chemical preservatives.

Unit 3: Nursery   **15**

3.1: Definition, objectives and scope, Infrastructure for nursery

3.2: Propagation Practices: Sexual and Asexual

a) Sexual: Seed: Sowing of seed, Transplanting of seedling, Advantages and Disadvantages.

b) Vegetative: i) Cutting – Definition, Stem cutting (Hard wood stem and soft wood stem),Use
of PGR's for rooting

            ii) Layering –Definition, Simple layering, Air layering

            iii) Grafting – Definition, Whip grafting, Approach grafting

            iv) Budding: Definition, T-budding, Patch budding

c) By specialized vegetative structure – Bulbs, Corms, Tubers, Rhizomes

Unit 4: Landscape Gardening   **15**

4.1 Definition, scope and objectives

4.2 Indoor Garden – Indoor plants, bottle garden, dish garden, hanging basket, Bonsai,

Vertical Garden

3.3 Outdoor Garden – Lawns, Preparation of lawn, lawn types, Rockery, Terrace garden, Water
garden, green house and polyhouse

3.4 Important aesthetic Gardens of India: i) Mughal garden, Delhi

                    ii) Brindavan garden, Mysore.

B.Sc. Part- III Botany
CREDITS: 2, LECTURE PERIOD: 3 PER WEEK, MARKS: 40+10
Paper- XIII   DSE –F25
Plant Biochemistry and Molecular Biology

Unit 1: Carbohydrates 12

1.1 Introduction and Classification of carbohydrates.

1.2 Structure and Properties of- a) Monosaccharides (Pentose: Ribose, Hexose: Glucose),

b) Oligosaccharides (Sucrose), c) Polysaccharides (starch).

1.3 Isomerism: Types of Isomers (Structural and Stereoisomer)

1.4 Significance of carbohydrates

Unit 2 : Lipids 12

2.1 Introduction, General Structure, properties and classification of Lipids

2.2 Structure and properties of Saturated Fatty Acids (Stearic and Palmitic acid) and Unsaturated

Fatty Acids (Oleic acid, Linoleic and)

2.3 Significance of Lipids

Unit 3: Proteins 11

3.1. Introduction, ructure**,** Properties, Characteristics and classification of Amino acids

3.2. Brief Outline of biosynthesis of Amino acid: Proline

3.3. General Structure, Classification of Protein

3.4. Protein Biosynthesis in Eukaryotes: Transcription and translation

Unit 4: Nucleic Acids 10

4.1 Introduction, Composition and Structure

4.2 DNA: Watson and Crick Model, Forms of DNA (A, B and Z)

4.3 DNA Replication in Eukaryotes

4.4 RNA: Types, structure and role of RNA's

4.5 Regulation of Gene expression**-** Lac Operon, Tryptophan Operon

B.Sc. Part- III Botany
CREDITS: 2, LECTURE PERIOD: 3 PER WEEK, MARKS: 40+10
Paper- XIV   DSE –F26
Bioinformatics, Biostatistics and Economic Botany

Unit 1: Bioinformatics   14

1.1 Introduction, Aim, Scope and Branches of Bioinformatics

1.2 Biological Databases: Classification Format and Retrieval system of Biological Database,

   National Center for Biotechnological Information (NCBI), Basic Local Alignment Search Tool

(BLAST)

1.3 Protein Information Resource (PIR) - Concept, Resources, Databases and Data Retrieval

1.5 Applications of Bioinformatics- Molecular Phylogeny (Concept, Methods, Analysis and

   Consistency)

Unit 2: Biostatistics   11

2.1 Introduction, definition, terminology.

2.2 Collection and presentation of data: Types of data, techniques of data collection- Census

   method, sampling method- simple random, stratified and systematic sampling.

Classification, tabulation, graphical representation- Histogram and polygon.

2.3 Measures of central tendency and Dispersion: Arithmetic mean, Mode, Median, Range,

   Deviation, Mean deviation, Standard Deviation, Coefficient of Variation.

2.4 Statistical methods for testing the hypothesis') Students' T-test ii) Chi-square test.

Unit 3: Economic Botany: Cereals, Legumes and Oils   10

3.1 Origin of Cultivated Plants - Concept of centers of origin, their importance with reference to

   Vavilov's work.

3.2 Cereals: Origin, Botanical Name, Morphology, Sources and Economic importance of Wheat.

3.3 Legumes: Origin, Botanical Name, Morphology, Sources and Economic importance of

   Gram and Soybean.

3.4 Oils and Fats: Origin, Botanical Name, Morphology, Parts used and uses of Ground nut.

Unit 4: Economic Botany: Spices, Beverages and Fibers   10

4.1 Spices and Condiments - Origin, Botanical Name, Morphology, Parts used and

Uses of Clove and Black pepper.

4.2 Beverages – Origin, Botanical Name, Morphology, Parts used and uses of Tea.

4.3 Fibre yielding Plants - Origin, Botanical Name, Morphology, Parts used and uses of

Cotton.

B.Sc. Part- III Botany
CREDITS: 2, LECTURE PERIOD: 3 PER WEEK, MARKS: 40+10
Paper- XV   DSE –F27
Plant Biotechnology and Paleobotany

Unit 1: Plant Biotechnology   03

1.1 History, Definition, Scope and Importance (Areas of application)

1.2 Biotechnology in India

Unit 2: Recombinant DNA Technology   15

2.1. Introduction, Principles and enzymes involved in DNA technology..

2.2. Cloning Vectors: a) Prokaryotic- Plasmid, Lambda phage and Cosmid.

   (Brief idea) b) Eukaryotic-YAC (Yeast Artificial Chromosomes).

2.3 Southern blotting and Northern blotting techniques and its applications, Molecular Probes

2.4. DNA Fingerprinting, Molecular DNA Markers (RAPD, RFLP)

2.5 PCR, DNA sequencing and Concept of Gene bank.

Unit 3: Plant Tissue Culture   15

3.1 Principles and Terminologies, Laboratory Requirement (Conditions and Instruments),

   Culture Media, Totipotency and Cellular Differentiation,

3.2 Micro propagation: Stages of Micro propagation- Callus formation, Root Initiation, Shoot

   Initiation, Primary and Secondary Hardening, Advantages and disadvantages

3.3 Embryogenesis: Protoplast culture, Cybrid

3.4 Somaclonal Variations

Unit 4: Paleobotany   12

4.1 General account, Geological time scale, process of fossilization, Types of fossils.

4.2 Study of following form genera with reference to systematic position, external morphology

   and affinities: a) *Lyginopteris* b) *Enigmocarpon*.

4.3 Application of paleobotany: Role of microfossil in oil and coal exploration.

B.Sc. Part- III Botany
CREDITS: 2, LECTURE PERIOD: 3 PER WEEK, MARKS: 40+10
Paper- XVI   DSE –F28
Bio fertilizers and Herbal Drug Technology

Unit 1: Biofertilizers   **11**

1.1 Introduction, Importance, types and study of –

        a) Bacterial fertilizers: *Rhizobium*, *Azotobacter*, *Azospirillum*

        b) Blue green Algal:, Cyanobacteria (BGA): *Nostoc*, *Anabaena*.

        c) Mycorrhizal association: VAM

        d) Fungal: *Trichoderma*

1.2 Organic manures –

        a) Farm Yard Manure, Green manure, Compost

        b) Vermicomposting and Vermi-wash

Unit 2: Herbal Medicines   **11**

2.1 Definition, Importance of herbal medicines

2.2 Classification of crude drugs: Taxonomical, Morphological and Chemical

2.3 Identification, authentication, collection, processing and storage of medicinal plants.

2.4 Introduction to general methods of extraction, isolation and purification of

Phyto constituents.

Unit 3: Herbal cosmetology   **11**

3.1 Applications of herbs in cosmetics: Shampoo (*Sapindus laurifolius, Acacia concinna*), hair

dye (*Lawsonia inermis*)

3.2 Facemask (*Santalum album*), bath oil (*Rosa indica*), perfume (*Jasminum sambac*).

Unit 4: Pharmacognosy   **12**

4.1 Pharmacognosy: Introduction And, Definition

4.2 Medicinal uses of Tulsi, Ginger, Methi, Avala.

4.3 Adulteration of drugs of natural origin: Evaluation by morphological, Microscopic,

     Chemical, Physical, Chromatographical, Spectrophotometric.

4.4 Plant antioxidants: Properties of Antioxidants, Vitamins (C and E)

Shivaji University, Kolhapur

B.Sc. III Botany (CBCS Syllabus)

Practical-I (Based on Paper No. X and XV)

1	Preparation of culture media –PDA (slants and Plates) and sterilization.
2	Methods of inoculation- on slants and plates
3	Isolation of soil fungi by serial dilution method.
4	Study of different types of stains in biological studies.
5	Method of control of seed borne diseases (Dipping/Seed dressing)
6 and 7	Plant diseases as per theory
8 and 9	Demonstration of Mushroom Cultivation and Harvesting
10	Isolation of plant genomic DNA and its spooling.
11	Calorimetric estimation of DNA using di-phenyl amine.
12	Preparation of plant tissue culture medium (M.S.).
13	Demonstration of techniques of *In Vitro* culture using suitable ex-plant.
14	Demonstration of inoculation of explants on suitable medium (M.S.)
15	Isolation of Protoplast.
16	Study of steps in genetic engineering for the production of Golden rice with the help of photographs.
17	Identification of types of fossils – i) Impression ii) Compression iii) Petrification IV) Coal.
18	Identification of – i) *Lyginopteris*
19	Identification of *Enigmocarpon*
20	Submission of plant diseases

1. Genetic examples on Linkage.

2. Genetic examples on Crossing over

3. Genetic examples on Polygene inheritance

4. Determination of chromosome count in PMCs in *Allium / Cynoetis*.

5. Detection of meiotic anomalies in chromosomes in *Rhoeo.*

6. Preparation of karyotypes – idiograms by using photographs.

7. Methods of emasculation

8. Breeding techniques in a) Malvaceae b) Fabaceae c) Poaceae

9. Mounting of floral parts.

10. Study of World map to show Vavilov's centers of origin of cultivated plants.

11. Study of Botanical Name. Morphology, Parts used and Economic importance of Wheat.

12. Study of Botanical Name. Morphology, Parts used and Economic importance of Gram and Soybean.

13. Study of Botanical Name. Morphology, Parts used and Economic importance of Clove and Black pepper.

14. Study of Botanical Name. Morphology, Parts used and Economic importance of Ground nut.

15. Study of Botanical Name. Morphology, Parts used and Economic importance of Cotton.

16. Measures of central tendency of given data.

17. Study of frequency distribution and its graphical representation

18. Determination of Standard deviation of the given data.

19. Submission of PPT on the basis gene transfer method.

Shivaji University, Kolhapur
B.Sc. III Botany (CBCS Syllabus)
Practical-III (Based on Paper No. XI and XVI)

1. To study prokaryotic cells (bacteria), eukaryotic cells with the help of electron micrograph / photographs.

2 and 3   Study of the photomicrography technique.

4   Study of cell structure in Onion, *Hydrilla* leaf and *Spirogyra* filament.

5   Study of mitosis.

6   Study of meiosis.

7.   Use of dialysis to separate smaller molecules from larger molecules.

8   Micrometry technique.

9   Study of DNA packaging by micrographs.

10   Study of Beer and Lambert's Law.

11   Preparation of permanent cytological slides.

12   Submission of photomicrograph.

13   Application of Biofertilizers - i) *Nostoc* ii) *Azotobacter iii) Rhizobium iv) Trichoderma*

14   Identification of organic manure – i) Green manure (*Crotolaria juncea*),

  ii) Vermicompost   iii) Vermiwash

15 and   Herbal Preparations of

16   i) Churn (Triphalachurna) ii) Kadha /Decoction (Adulsa)

  iii) Hair oil (Maka)iv) Shampoo (Ritha, Shikakai).

17   Biochemical test for drug adulteration of

  i) Haladi (*Curcuma longa*) ii) Hing (*Ferulaassa-foetida*)

  iii) Camphor (*Cinnamomum camphora*) iv) Saffron (*Crocus sativus)*

18   Macroscopic (Organoleptic) study of – i) Tulsi ii) Ginger iii) Methii v) Avala.

19   Determination of Vein-islet Number by Camera Lucida.

20.   Phytochemical analysis- Qualitative tests for Tannins, Alkaloids, Saponins, Steroids, Terpenoids, Flavonoids, reducing sugars, carbohydrates. (Any four).

21   Visit to Herbal cosmetics industry/Pharma industry (Separate handwritten report to be submitted by student).

1. Study of budding technique – Patch and T-budding

2. Study of Layering technique – Air layering

3. Study of Grafting technique – Whip and Approach

4. Technique of Potting and Repotting

5. Demonstration of Bonsai

6. Demonstration of Bottle garden and hanging baskets.

7. Floral arrangement – Flower pot, Floral bouquet, Floral Rangoli

8. Garden implements (Any five) – Garden shear, sickle, cutter, shovel, budding knife, secateur, water can, pruning scissors, sprayer, spade

9. Study of ornamental plants – Rose, Gerbera, Marigold

10. Study of hedge and edge plants.

11. Study of indoor plants.

12. Qualitative test for sugar in plant material

13. Qualitative tests for starch and cellulose in plant material

14. Qualitative test for proteins.

15. Qualitative test for lipids.

16. Identification of sugars by ascending paper chromatography.

17. Determination of fatty acid value of oil sample.

18. Separation and identification of amino acids by TLC (Thin Layer Chromatography).

19. Determination of iso-eletric point of plant protein.

20. Visit to nursery/ Aesthetic garden / Exhibition / Food industry (Separate handwritten report to be submitted by student)

List of Books Recommended for B. Sc. III Botany

Cytology and Genetics ---

1. Cell Biology - S. C. Rastogi (1992)
2. Cell Biology - C. B. Powar (2000)
3. Cell Biology, Genetics, Evolution and Ecology – P S. Verma, V K. Agarwal (2001)
4. Cell Biology - R. Dowben (1971)
5. Cell and Molecular Biology – P. K. Gupta (1999)
6. Cell and Molecular Biology (2001) – E. D. P De Robertis& E. M. F De Robertis (Jr.)
7. Cell Physiology - A C. Giese (1979)
8. Cellular Energy Metabolism and Its Regulation - Atkinson, D. E. (1977)
9. Genetics - P. K Gupta (1997)Rastogi Publications. Shivaji Road, Meerut.
10. Gene Action - Hartman alldSuskind (1968)
11. Cytology and Genetics.--Dnyansagar(T. Magrewith& Co.)
12. Plant Chromosomes: Laboratory Methods--Fukui. K. and Nakayama S. 1996. CRC Press, Boca Raton, Florida.
13. Plant Chromosomes: AnalysisManipulation and Engineering. Sharma A.K. and Sharma A. 1999. Hawood Academic Publishing, Australia.
14. Fundamentals of Cytology --L. W. Sharp.
15. Principles of Genetics -Snustad. D. P. and Simmons. M.J. 2000. (2nd Edition).John Wiley & Sons Inc., USA.
16. Cytogenetics and Plant Breeding-- S N. Chandrashekharan and S. V. ParthaSarathy.
17. The Science of Genetics.-Atherly. A.G., Girton. J.R. and McDonald. 1999. Saunders College Publishing Co., Fort Worth USA.
18. Principles of Genetics- Gardener. J., Simmons. H.J. and Snustad. D.P. 1991. (8th Edition). John Wiley & Sons, New York.
19. Genetics: Principles and Analysis--Hartl.D.L.andJones.E.W. 1998. (4thEdition) Jones & Barlett Publishers. Massachusetts. USA.
20. Genetics (5th Edition).-Russel. P.J. 1998. The Benjamin/Cummings Publishing Co., Inc., USA.
21. MolecularBiology of Cell. Alberts B., Bray D., Lewis, J., Raff, M. Roberts, K. and Wastson, J.D. 1999.Garland Publishing Co., Inc., New York USA.
22. Karp, G. 2010. Cell and Molecular Biology: Concepts and Experiments. 6th Edition. John Wiley & Sons. Inc.
23 De Robertis, E.D.P. and De Robertis, E.M.F. 2006. Cell and Molecular Biology. 8th edition. Lippincott Williams and Wilkins, Philadelphia.
24.   Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. 2009. The World of the Cell. 7th edition. Pearson Benjamin Cummings Publishing, San Francisco.
25. Molecular biology (principles and practices) Dr. priyanka Siwach and Dr. Namita singh laxmi publication. ISBN 9788131807476.
26. Molecular biology , N Arumugam , Saras Publication . ISBN 9789382459835
27. Molecular biology , Dr. P.S. Verma , Dr. V.K. Agrawal, P.Chand Publication
28. Molecular biology Concepts for Inquiry Jenifer A Hackett.
29. Esential cell biology 4th edition Bruce alberts, Dennis bray,Karen Hopkin, AlexanderD, Jahnson.

Economic Botany:
1. Kocchar, S. L. 1998. Economic Botany in Tropics, 2nd edition. MacmillanIndia Ltd., New Delhi.
2. A Textbook ofEconomic Botany--Sambamurthy, A. V. S. S. and Subramanyam, N. S. 1989. Wiley Eastern Ltd., New Delhi.
3. Hill's Economic Botany. -- Sharma, O. P. 1996. Tata McGraw Hill PublishingCompany Ltd., New Delhi.
4. Economic Botany - Plants inOur World. Simpson, B. B. and Conner-Ogorzaly, M. 1986. McGraw Hill, New York.

Horticulture and Gardening:
I. Gardening in India. -- Perey Lancaster (1997) Oxford & I B H Publishing Co.Pvt.Ltd,New Delhi.
2. Floriculture: Fundamentals & Practices. - Alex Laurie and Ries V.C. (2003)
3. Percy Lancaster's Gardening in India.- Bose, T.K. and Mukherjee, D. (1997) (Ed.)Oxford and IBH Publ. (P.) Ltd,, New Delhi, India.
4. A Art of Miniature Plant Culture. - Day, S.C. (2003)Agrobias. Jodhpur, India.
5. Complete Home Gardening. -Dej, S.C. (2003) Agrobias, Jodhpur, India.
6. Principles and Techniques for Plant Scientists. -Dhopte, A.M. (2003) Agrobios,Jodhpur, India.
7. Horticulture and Gardening.- Khan, M.R. (1995) NiraliPrakashan, Pune. India.
8. Gardening for every one- PramilaMehra. Hind pocket book private limited, NewDehli.
9. Kumarsen V. Horticulture ,Saras Publication
10.Bose T.K. & Mukherjee, D., 1972, Gardening in India, Oxford & IBH PublishingCo., New Delhi.
11. Sandhu, M.K., 1989, Plant Propagation, Wile Eastern Ltd., Bangalore, Madras.
12.Kumar, N., 1997, Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
13.Edmond Musser & Andres, Fundamentals of Horticulture, McGraw Hill Book Co.,New Delhi.
14.Agrawal, P.K. 1993, Hand Book of Seed Technology, Dept. of Agriculture andCooperation, National _Seed Corporation Ltd., New Delhi.
15.Janick Jules. 1979. Horticultural Science. (3rd Ed.), W.H. Freeman and Co., SanFrancisco, USA.
16.Randhawa, G.S. and Mukhopadhyay, A. 1986. Floriculture in India. Allied Publishers.

Microbiology and Plant Pathology

1) Microbiology- P.D.Sharma; Rastogi Publications
2) Plant Pathology- Mehrotra
3) Plant Diseases- R.S. Singh
4) Plant Diseases- Rangaswamy

Biochemistry
1) Fundamentals of Biochemistry- J.L.Jain, Sunjay Jain, Nitin Jain; S. Chand & Company Ltd.
2) Cell Biology, Genetics, Molecular Biology, Evolution and Ecology- P. S. Verma, V. K. Agarwal; S. Chand & Company Ltd.

Bioinformatics
   1) Introduction to Bioinformatics – S. Sundara Rajan, R. Balaji; Himalaya Publishing House.

Plant Biotechnology

   1. Elements Of Biotechnology- P. K. Gupta (Second Edition); Rastogi Publications

   2. Plant Tissue Culture - Kalyan Kumar De; New Central Book Agency (P) Ltd.

   3. Introduction to Plant Tissue Culture - M. K. Razdan (Second Edition); Oxford & IBH Publishing Co. Pvt. Ltd.
   4. Practical Biotechnology and Plant Tissue Culture - Prof. Santosh Nagar, Dr. Madhuri Adhav; S. Chand & Co. Ltd.
   5. Arnold C.A.1972. An Introduction to PalaeobotanyTata McGraw-Hill,
   6. Andrews H.N. Studies in Palaeobotany 1961. John Wiley & Sons Canada, Limited,
   7. Shukla A.C. and S.P . Mishra. Essentials of Palaeobotany.
   8. Wilson, N. S. and Rothwell,G.W.1983. Palaeobotany and the Evolution of Plants (2ndEdition).Cambridge University Press U.K.
   9. Dubey, R.C., 2005 A Text book of Biotechnology S.Chand& Co, New Delhi.
   10. Kumaresan, V. 2005, Biotechnology, Saras Publications, New Delhi.
   11. John JothiPrakash, E. 2004. Outlines of Plant Biotechnology. Emkay ¬Publication, NewDelhi.

Biofertilizers and Herbal Technology

   1. Sathe, T.V. 2004 Vermiculture and Organic Farming. Daya publishers.

   2. SubhaRao, N.S. 2000, Soil Microbiology, Oxford & IBH Publishers, New ¬Delhi.

   3. Vayas,S.C, Vayas, S. and Modi, H.A. 1998 Bio-fertilizers and organic ¬Farming Akta

   Prakashan, Nadiad

   4. Chopra R.N., S.L.Nayar and I.C.Chopra, 1956.Glossary of Indian medicinal plants

   C.S.I.R, New Delhi.

   5. Dey and Raj Bahadur,1984. The indigenous drugs of India, Kanny, Lall,.

   International Book Distributors.

Details of Practical Examination
A) Every candidate must produce a certificate from Head of the Dept. in his /her college, stating that he / she has completed practical course in satisfactory manner as per guidelines laid down by Academic Council on the recommendations of Board of Studies in Botany. The student should record his / her observations and report of each experiment should be written in the journal. The journal is to be signed periodically by teacher in charge and certified by the Head of the Department at the end of year. Candidates have to produce their certificated journal and tour report at the time of practical examination. Candidate is not "allowed to appear" for the practical examination without a certified journal / a certificate from Head of the Botany Dept. regarding the same.

B) Practical Examination shall be of Five hours duration and shall test a candidate in respect of the following.
1. Practical study of external and internal structures of different plant types and their classification.
   Making temporary stained preparations and identification.
2. Identification and setting of experiments as per syllabus.
4. Spotting of the specimens as per syllabus.

Botanical Excursions

One teacher along with a batch not more than 20 students be taken for botanical excursion to places of Botanical interest, one in each term. If there are female students in a batch of 20 students, one additional lady teacher is permissible for excursion. Each excursion will not be more than SEVEN days during college working days. T.A. and D.A. for teachers and non-teaching staff participating in excursions should be paid as per rules. Tour report duly certified by tour in charge teacher and Head of the Department should be submitted at the time of practical examination. For every study tour take the prior permission of the head of the department and Principal.

Practical Course

B. Sc. III Botany Practical course covered in four practical numbers (Practical no.1 , Practical no.2, practical no.3 and practical no. 4 with total 80 practicals). These practicals are to be performed by the students. Each practical is to be supplemented by permanent slides, preserved / fresh specimens / materials, charts, herbarium sheets, etc. wherever necessary.

C] OTHER FEATURES:

1.   INTAKE CAPACITY / NUMBER OF STUDENTS:-

As per university rules.

2.   TEACHERS QUALIFICATIONS:-

• As prescribed by norms.
• However required number of core faculty should be given for particular course along with paper wise and Specialization wise work load allocation.
• Work load details should be as per Apex body/UGC/State Govt./University norms.

2 The Board of studies should clearly mention the required Books, Journals and specific Equipments necessary for the Course.

(A)   LIBRARY: Library be equipped with the required Reference and Text Books, Journals and Periodicals for higher and advanced studies as per stated in revised syllabus and approved by BOS.

 (B)   SPECIFIC EQUIPMENTS:

T.V., V.C.R. V.C.P., L.C.D., Overhead Projector, Computers and necessary software and operating systems etc. are necessary to run the course.

(C)   LABORATORY SAFETY EQUIPMENTS

i)Fire extinguishers at least two sets in each laboratory of 600 sq.ft. Area.

ii) Leakage of gases be avoided.

iii) First aid kit be made available.

iv) Sugar / Glucose –500gm pack- a pinch of sugar and a cup of drinking

water in hypoglycemic condition or in extreme weakness of student or

a person concerned

B) GENERAL SAFETY RULES FOR LABORATORY   WORK

1) List of equipments needed for Laboratory Safety:-

1. Fire extinguisher
2. First Aid Kit
3. Good earthing and insulated wirings for electrical supply.
4. Emergency exit
5. Apron and goggles wherever necessary
6. Fuming Chambers
7. Masks flows and shoes while handling hazardous chemicals & gases (Good valves, manometers and regulators for gas supply)
8. Operational manuals for instruments (handling to be made as suggested.)
9. Rules of animals and blanks ethics.
10. Leakage of gases to be avoided.
11. Cylinders or flow pipes to handle Acids.
12. No weighings for NaOH and hygroscopic substances.
13. Stabilized supply in the laboratory.

2)   There Is No Substitute for Safety

1.   Any injury no matter how small, it must be reported to teacher immediately.

2.   a) In case any chemical enters your eyes go immediately to eye-   wash facility

   and flush your eyes and face with large amount of water.

   b) For acid or phenol split, do not use water instead put some bicarbonate.

3.   In case of fire, immediately switch of all gas connections in the laboratory and pour sand on the source of fire or cover it with asbestos or cement sheet.

4.   While leaving laboratory, make sure that gas, water taps and electricity are switched off.

5.   Remove your lab coat. Gloves and clean your hands before leaving laboratory.

6.   Make your workplace clean before leaving the laboratory.

7.   Keep your hands away from your face, while working in laboratory.

8.   Each laboratory must have a first aid box.

9. Know what to do in case of emergency - e.g.

(a) Know the place of fire extinguisher and first aid box.

10. Don't use cell phones in the laboratory.

(a) Remember important phone numbers

3) DO's

1. Always wear lab coat, shoes in the laboratory. Every student must have their weight box, a napkin etc.

2. Maintain separate record book for each subject.

3. Keep your belongings at the place allotted for the same.

4. Maintain silence, order, cleanliness and discipline in the laboratory.

5. Work at the place allotted to you or specially used for certain operations.

6. Keep the working table clean.

7. Handle the laboratory equipments, glassware and chemical with great care.

8. Use only required quantities of material and apparatus of essential size.

9. Perform the test in their proper order.

10. Know the location of eye wash fountain and water shower.

11. Minimize your exposure to organic solvents.

12. The Metal like sodium should be kept under kerosene or liquid paraffin layer in a vessel with a cork stopper.

13. Sodium metal should be cut on dry filter paper. The cut off pieces of sodium should be immediately collected in a vessel containing kerosene or liquid paraffin.

14. Always pour acid into water when diluting and stir slightly.

15. All operations involving poisonous flammable gases and vapours should be carried out in the flame chamber (with exhaust facility)

16. Ladies should avoid wearing saree. If it is there, apron is essential.

4) DON'T

1. Don't work alone in the laboratory

2. Don't leave the glass wares unwashed.

3. Don't take apparatus, chemicals out of lab.

4. Don't leave any substance in a vessel or bottle without label.

5. Don't weigh the reagent directly on the balance pan.

6. Don't throw the cut off pieces of sodium metal in sink or water. Transfer it immediately in its container.

7. Don't take sodium metal with hands. Use forceps.

8. Don't panic and run in case of fire. Use the fire extinguishers or sand buckets.

9.   Don't breathe the vapours of organic solvents.

10. Don't pour any unused reagent back in its stock bottle.

11. Don't eat or drink any food in laboratory.

12. Don't use inflammable solvents like benzene, ether, chloroform, acetone and alcohol around flame.

13. Don't distill to dryness.

14. Don't exchange stoppers of flasks and bottles containing different reagents.

15. Don't leave reagent bottle lying on the table.

16. Don't disturb the order of reagent bottles in which they are placed.

17. Don't bring reagent on your working table from the general shelf.

18. Don't throw burning matchstick into dustbin.

19. Don't leave the laboratory without permission.

5)   LABORATORY / FIELD WORK CARE AND SAFTY FOR BOTANY STUDENTS

1.   Unnecessary wastage of plant material during practical should be avoided.

2.   During study tour / personal collection, more emphasis be given on study of plants in nature and collection of wild plants should not be carried out.

3.   If at all the collection of the plant material in needed, it should be carried out under supervision of concerned teacher. Collection of poisonous plants / poisonous mushrooms should be avoided.

4.   Oral intake of unknown plant material, out of curiosity, during practical or collection tour is strictly prohibited.

5.   If there is any allergic reaction while handling the plants / plant parts / pollen grains / fungal specimens it should be immediately brought to the notice of the concerned teacher and reported to the registered medical purloiner.

6.   Wearing of hand gloves (and mask) is essential while handling poisonous plants / herbarium sheets / toxic and hazardous chemicals / reagents / strong acids / strong alkalis during the experiment should be made with vacuum pipette / auto pipette / burette under the supervision of concerned teacher / lab assistant.

7.   Highly inflammable organic solvents (alcohol, acetone etc.) should not be kept in vicinity of spirit lamp.

8.   The laboratory safety measures adopted for handling of hazardous chemicals in chemistry practicals should be followed for conducting practicals in plant biochemistry / microbiology.

9.   Operational manuals for equipments such or centrifuge, autoclave, spectrophotometer should be followed.

10. In case of minor injuries, preliminary treatment should be undertaken with the help of first aid kit available in the laboratory. In case of serious injury, concerned teacher should be immediately contacted for consultation to the physician.

11. The instruction report for breeding, experimentation will be submitted in a week period. (Which are laid down by Ministry of Social Justice & Empowerment and Ministry of Environment and Forests, Govt. of India).

Course outcomes

1. Students are acquainted with basic as well as recent knowledge in the field of molecular biology, biotechnology and bioinformatics

2. Acquiring the basic procedure in the field of microbiology and plant pathology.

3. To develop skills in of horticulture including nursery, landscaping, gardening, floriculture and polomology

4. Students will be able to demonstrate their knowledge, skills and attributes to be successful contributing members o the horticulture profession.

5. Acquaint the student with the comprehensive knowledge in the bio fertilizers, herbal drug technology and paleobotany

6. Students will able to demonstrate their understanding of relevant course theories and concepts
 Students able to Mendelian and Neo-mendelian genetics

7. Students become familiar with the Organic manures, Herbal Medicines, Herbal cosmetology and Pharmacognosy.

8. Understand the methods of Plant Biotechnology, Protoplast culture and Recombinant DNA Technology.

9. Acquainted the scope of paleobotany in the present scenario and understand the fossil genera

10. Aware about the Spices, Beverages and Fibers, Cereals, Legumes and Oils.

11. Understand the of carbohydrates, lipids, proteins

12. Understand the techniques of plant breeding

13. Understand the techniques of mushroom cultivation.

14. Acquainted the techniques of micrometry, chromatography and other laboratory techniques used in the field of life science.

SHIVAJI UNIVERSITY, KOLHAPUR.

Accredited By NAAC with 'A' Grade

Revised Syllabus For

Bachelor of Science

Part-II
Chemistry
CBCS PATTERN

Syllabus to be implemented from

June, 2019 onwards.

Paper No. DSC- C3 - Chemistry paper No. V (Physical Chemistry)

(Theory Credits: 02   : 30 hours, 38 lectures)

Name of the Topics	Expected Learning Outcome
1 Electrolytic Conductivity	Learning and understanding conductivity and transport number of the aqueous solutions with different applications.
2 Physical Properties of Liquids	Knowledge about surface tension, viscosity and refractive index will be gained by the student
3 Surface Chemistry	Learning and understanding surface phenomena at heterogeneous surfaces
4 Nuclear Chemistry	Learning the various Nuclear phenomena and measurement of nuclear radiations
5 Chemical Kinetics	Learning and understanding the knowledge about third order reaction and theories of reaction rates

Unit- I Electrolytic Conductivity (16L)

Introduction, Types of conductors, Conductivity, Equivalent and Molar conductivity and their variation with dilution for weak and strong electrolytes in aqueous solution. Equivalent conductivity at infinite dilution, Measurement of conductance by using Wheatstone bridge. Kolharausch law of independent migration of ions and its applications such as Ionic mobility, determination of degree of ionization of weak electrolyte, solubility and solubility products of sparingly soluble salts, ionic product of water, hydrolysis constant of salt. Conductometric titrations (only acid base titrations). Advantages of conductometric titrations.

Transference number, Hittorf's rule, determination of transport number using Moving boundary method, factors affecting transport numbers. Numerical problems.

Unit- II   Physical Properties of Liquids (6L)

Introduction, Classification of physical properties, Surface tension and its determination using Stalagmometeric and differiential capillary rise methods, Viscosity and its determination using Ostwald's viscometer, Refractive index (Snell's law), Specific and Molecular refractivies and its determination using Abbe's refractometer.

Unit – III   Surface Chemistry (7L)

Introduction, Adsorption as a surface phenomenon, Defination of adsorption, adsorbent, adsorbate, absorbent. factors affecting adsorption, Types of adsorption, Distinction between physical and chemical adsorption, Adsorption isotherms: Freundlich adsorption isotherm, Langmuir adsorption isotherm. Types of physical adsorption isotherms, applications of adsorption.

Unit – IV   Nuclear Chemistry (5L)

Introduction, Types of Nuclear radiation, properties of α, β and γ radiations , Detection and measurement of nuclear radiations by Scintillation and Geiger muller counter methods, radioactive equilibrium and range of α- particles, Geiger Nuttal relations ,determination of radioactive constant (decay constant).

Unit --V   Chemical Kinetics   (4L)

Introduction, Third order reactions: derivation of rate constant, characteristics and examples of third order reaction. Theories of reaction rates as Collision theory and Transition state theory (only quantitative aspect, derivation not expected),

Reference Books:

1) Barrow, G.M. Physical Chemistry Tata McGraw-Hill (2007).
2) Castellan G.W. Physical Chemistry 4 th Ed. Narosa (2004).
3) Kotz, J.C. Treichel, P.M.& Townsend,J.R.General Chemistry, Cengage Learning India Pvt Ltd: New Delhi (2009).
4) Mahan ,B.H. University Chemistry, 3rd Ed. Narosa (1998).
5) Petrucci, R.H. General Chemistry, 5th Ed., Macmillan Publishing Co,: New York (1985).
6) Elements of Physical Chemistry S., Glasstone, D. Lewis.(2010)
7) Principles of physical Chemistry Marron and Prutton. (2007).
8) Elements of Physical Chemistry P.W.Atkins (2017)
9) Essentials of Physical Chemistry Bahl and Tuli. S. Chand, 2010.
10) Physical Chemistry Danials and Alberty (2016)
11) University General Chemistry C.N.R.Rao (2016)
12) Principals of Physical Chemistry Puri, Sharma and Pathania 47Th Edison, Vishal Publishing Co. Daryaganj Delhi. 110002 (2017)
13) Physical Chemistry A.J.Mee.(2015)
14) Advanced Physical Chemistry Gurudeep Raj (2017)
15) Physical Chemistry R.A.Aleberty.(2017-18)
16) Petrucci, R.H. *General Chemistry* 5th Ed. Macmillan Publishing Co.: New York (1985).

Paper No. DSC-C4- Chemistry paper No. VI (Industrial Chemistry)

(Theory Credits: 02   : 30 hours, 38 lectures)

Expected learning Outcomes :

Name of the topic	Expected Learning Outcome
1.Basic concepts in Industrial Chemistry	a.Learning and Understanding basic concepts and concentration terms b.Distinguish between classical and industrial chemistry c. Distinguish between unit operations and unit processes
2. Unit Operations	Knowledge of some unit operations
3.Corrosion and Electroplating	Understanding the process of corrosion and Knowledge of prevention from corrosion
4.Paper Industry	Knowledge of Indian paper industry
5.Soap and Detergents	Knowledge about the chemical nature and cleansing action of soap

Unit I Basic Concepts in Industrial Chemistry(10)

The difference between classical chemistry and industrial chemistry, Raw material for the Chemical Industry,Material Safety data sheets,Units that make up a chemical process-unit operation and unit processes, Flow Diagrams,Block Diagram, Process flow diagram / flow sheets, Material Balances-The purpose of mass balance calculations,Material Balance Equations,Mass balance calculation procedure and simple example

 Definition and Explanation of terms -Normality, Equivalent weight, Molality, Molecular weight,Molarity, Molarity of mixed solution, Acidity of base, Basicity of acid,ppt, ppm, ppb solutions, Mole Fraction, Weight fraction, Percentagecomposition by W/W, W/V, V/V, Problems based on Normality, Molarity, mole fraction, mixed solution, etc.

Unit II Unit Operations(06)

Size reduction- Principle,Jaw crusher,ball mill

Size Enlargement –Principle,Pellet mill,tumbling agglomerators

Separation – Magnetic separation,Froth flotation,Distillation-Distillation of liquid mixtures, Types of distillation, Types of columns and packings, Condensers, Vacuum distillation, Spinning-banddistillation, Steam distillation.

Unit III. Corrosion and Elecroplating (09)

Introduction of corrosion, Electrochemical theory of corrosion,Factors affecting on corrosion -i. Position of metals in the electrochemical series on the basis of standard reduction potential   ii. Purity of metal   iii. Effect of moisture   iv. Effect of oxygen (differential aeration principle)   v. Hydrogen overvoltage, Methods of protections of metals from corrosion, Electroplating: Electrolysis, Faraday's laws, Cathode current Efficiency, Basic principles of electroplating, Cleaning of articles, Electroplating of chromium, Anodising

Unit IV Paper Industry (06)

Manufacturing of Pulp,Types of pulp-Sulphate and soda ,Manufacturing of paper, calendaring ,ecological problems of Indian Paper industry, Features of good paper industry

UnitVSoaps and Detergents (07)

 Introduction, Soaps   - Raw materials, Types of soaps, Cleansing action of soap, Manufacture of soap   - Boiled or Hot Process, Detergents - Raw Materials, Types of Detergents: Anionic, cationic and amphoteric, Preparation of Teepol and Deriphat, Comparisons between soaps and detergents.

Reference Books:

1) Principles of Physical Chemistry by Puri, Sharma and Pathania, VishalPublishing company Jalindhar
2) Essential of Physical Chemistry by Bahl B.S., Tuli G.D. and BahlArun, S.Chand and Company Ltd.New Delhi
3) Modern Analytical Chemistry By David Harvey, McGRAW-Hill InternationalEdition, 2000
4) Industrial chemistry by B.K.Sharma, Goel Publishing Housing, 16th edition2011
5) Advanced Inorganic Chemistry, Vol.No.1, by Gurudeep Raj, Krishna Prakashan
Media Ltd, Goel Publication, Meerut
6) Analytical chemistry by B.K.Sharma, Krishna Prakashan Media Ltd, Meerut,edition 3rd 2011
7)Principles of electroplating and electroforming by Blum and Hogaboom
8)Chemical Process Industries by Shreve and Brink
9)Indusrial Chemistry by LoutfyMadkor and Helen Njenga
10) Elementary Principles of Chemical Processes by Richard Felder and Ronald Rousseau,John Wiley and Sons

Paper No. DSC-D3- Chemistry paper No. VII (Industrial Chemistry)

(Theory Credits: 02   : 30 hours, 38 lectures)

Expected learning Outcomes :

Name of the topic	Expected Learning Outcome
1.Co-ordination Chemistry	.Learning and Understanding basic concepts about coordination complexes
2. Chelation	Knowledge about application of chelates in analytical chemistry.
3. P- Block elements	Understanding the properties of P – block elements
4. Chemistry of elements of 3d series elements	Student will be capable of understanding the properties of 3d series elements
5 Inorganic semi-micro qualitative analysis	Student will learn the basic knowledge about the qualitative analysis of inorganic compounds

Unit 1: Co-ordination chemistry (10)

1.1 Introduction-Definition and formation of co-ordinate covalent bond in $BF_3 – NH_3, [NH_4]^+$ and H_2O
1.2 Distinguish between double salt and complex salt
1.3 Werner's theory-
    1.3.1. Postulates
    1.3.2. The theory as applied to cobalt amines viz. $CoCl_3.6NH_3$, $CoCl_3.5NH_3$, $CoCl_3.4NH_3$, $CoCl_3.3NH_3$
1.4 Description of the terms- ligand, co-ordination number, co-ordination sphere, Effective atomic number
1.5 IUPAC nomenclature of coordination compounds.
1.6 Isomerism in complexes with C.N. 4 and 6
    1.6.1 Geometrical Isomerism
    1.6.2 Optical Isomerism
    1.6.3 Structural Isomerism-Ionisation Isomerism, Hydrate Isomerism, Coordination
        Isomerism, Linkage Isomerism and Co-ordination position Isomerism
1.7 Valance bond theory of transition metal complex with respect to, C.N. 4, complexes of Cu and Ni
    C.N. 6 complexes of Fe and Co

Unit 2: Chelation (05)

2.1 A brief introduction with respect to ligands, chelating agent, chelation and metal chelates.
2.2 Structural requirements of chelate formation
2.3 Difference between metal chelate and metal complex
2.4 Classification of chelating agents (with specific illustration of bidentate chelating agents)
2.5 Application of chelation with respect to chelating agents - EDTA and DMG

Unit-3. P- Block elements (Group 13, 14 and 15) (09)

3.1. Position of elements in periodic table
3.2. Characteristics of p-block elements with special reference to Electronic configuration and Periodic properties
3.3. Compounds of group 13,14 and 15
    3.3.1 Boron-Diborane method of preparation and nature of bonding (structure)
    3.3.2 Borazine method of preparation and nature of bonding (structure)
    3.3.3 Allotropes of carbon and phosphorus
    3.3.4 Oxyacids of nitrogen – HNO_2 , HNO_3.
    3.3.5 Hydrides of Nitrogen- NH_3 and N_2H_4

Unit 4: Chemistry of elements of 3d series elements (06)

4.1 Position of elements in periodic table
4.2 Characteristics of d-block elements with special reference to
    i) Electronic structure
    ii) Oxidation states, stability of oxidation states of Fe with respective to Latimer diagram
    iii) Magnetic character
    iv) Colored ions
    v) Complex formation.

Unit-5. Inorganic semi-micro qualitative analysis (08)

5.1 Theoretical principles involved in qualitative analysis.
5.2 Applications of solubility product and common ion effect in separation of cations into groups.
5.3 Application of complex formation in
  a) Separation of II group into IIA and IIB sub-groups.
  b) Separation of Copper from Cadmium.
  c) Separation of Cobalt from Nickel.
  d) Separation of Cl^-, Br^-, I^-.
  e) Detection of NO_2^-, NO_3^- (Brown ring test).
5.4 Application of oxidation and reduction in
  a) Separation of Cl^-, Br^-, I^- in mixture   b) Separation of NO_2^- and NO_3^- in mixture.
5.5 Spot test analysis.

Reference Books :
1. Inorganic chemistry, Principles of structure and reactivity by J.E. Huheey and etal
2. Inorganic Chemistry by Shriver and Atkins 5 th edition
3. Vogels text book of Qualitative Inorganic analysis by A. I. Vogel .3 rd and 6th edition
4. Advanced Inorganic Chemistry by Agrawal Keemtilal (Pragati Prakashan)
5 Theoretical Inorganic chemistry by C.Day & J.Selbin IInd edition
6. Principles of inorganic chemistry by Puri Sharma & Kalia
7. Modern Inorganic chemistry by R.D.Madan (S.Chand)
8. Inorganic Chemistry by J.D.Lee
9. Basic Inorganic Chemistry by F.A.Cotton,G.Wilkilson & B.L.Gaus wiley
10. Chemistry for Degree students by R.L.Madan (S.Chand Publication)

Paper No. DSC- D4 - Chemistry paper No. VIII (Organic Chemistry)

(Theory Credits: 02   : 30 hours, 38 lectures)

Expected learning Outcomes :

Name of the topic	Expected Learning Outcome
Carboxylic acids and their derivatives.	To impart knowledge about the synthesis, reactivity and applications of carboxylic acids.
Amines and Diazonium Salts	Knowledge about classification, preparation and applications of amines and diazonium salts.
Carbohydrates	Understanding the classification, configuration and structure of carbohydrates.
Carbonyl Compounds- Aldehydes and Ketone	Student will be capable of understanding the nomenclature and reactivity of aldehydes and ketones.
Stereochemistry	Student will learn the basic knowledge conformational analysis of organic compounds

Unit 1: Carboxylic acids and their derivatives.   **[8L]**

1.1 Monocarboxylic acid: Introduction, Methods of Formation from Alcohols, Aldehydes, Ketones, Nitriles and Alkyl benzenes.
Chemical Reaction: Hell-Vohlard-Zelinsky (HVZ) reaction.
1.2 Formation of Halo Acids, Mono, Di, Tri- chloro acetic acid.
Substitution reaction of Monochloro acetic acid by Nucleophile OH^-, I^-, CN^- and NH_3
1.3 Hydroxy acids: Malic and Citric acid
Methods of formation of Malic acid from maleic acid, from Alpha bromo succinic acid and moist Ag_2O.
Chemical Reactions: Reactions of Malic acid- Action of heat, oxidation by $KMnO_4$ and reduction reaction with HI.
Uses of Malic acid
Method of formation of Citric acid from glycerol.
 Chemical Reactions: Reaction of citric acid: acetylation by acetic anhydride, reduction by HI, action of heat.
Uses of citric acid.
1.4 Unsaturated acid: Cinnamic acid: method of formation from benzaldehyde using diethyl malonate and by using acetic anhydride and sodium acetate.
Chemical Reactions- Bromination, Oxidation. Uses of cinnamic acid
Acrylic acid: Method of formation from acrolein and by dehydration of beta hydroxy propionic acid.
Chemical Reactions: Addition of water, Reduction by Na/ C_2H_5OH. Uses of acrylic acid.
1.5 Dicarboxylic acid: Succinic and phthalic acid
Method of formation of succinic acid from ethylene dibromide, maleic acid
Chemical Reactions: Action of heat, Action of $NaHCO_3$, C_2H_5OH in presence of acid.
Uses of succinic acid.
Phthalic acid: Method of formation from o-xylene and Naphthalene
Chemical Reactions: Action of heat, reaction with sodalime, ammonia, uses of phthalic acid.
1.6 Carboxylic acid derivatives: Introduction

Acid halide derivative: Acetyl chloride: formation from acid, by action with PCl_3 and $SOCl_2$, reaction with water, alcohol (Mechanism of esterification is expected) and ammonia.
Uses of acetyl choride.
Acid anhydride derivative: Method of formation of acetic anhydride by dehydration of acetic acid, reactions with water, alcohol and ammonia, uses of acetic anhydride.

Unit 2: Amines and Diazonium Salts: [8L]

2.1Introduction, Classification, Nomenclature, structure.
2.2 Methods of preparation: a) From Alkyl halide by Amonolysis, b) By Reduction of Nitriles or Cyanides, c) From Unsubstituted amides (Hoffmann degradation), d) By Gabrial Synthesis (From Phthalamide).
2.3 Reactions: Carbylamine reaction, Schotten-Baumann reaction, Electrophilic substitution (Aniline), Nitration, Bromination, Sulphonation.
2.4 Diazonium salt:Introduction, Preparation of Benzene diazonium chloride.
2.5 Reactions: Replacement by Halogen(Sandmeyer), Replacement by Iodine, Replacement by –OH, C and N Coupling reactions: Synthesis of Methyl orange and Congo red.Reduction of BDC.

Unit 3: Carbohydrates [8L]

Classification of carbohydrates, reducing and non-reducing sugars, General properties of
glucose and fructose, their open chain structure. Epimers, mutarotation and anomers.
Determination of configuration of Glucose (Fischer proof). Ring structure of glucose Determination of size of the ring of Glucose by methylation method..Haworth projections.Cyclic structure of fructose.Linkage between monosachharides, structure of disacharrides (sucrose, maltose, lactose) andpolysacharrides (starch and cellulose) excluding their structure elucidation.

Unit 4: Carbonyl Compounds- Aldehydes and Ketone [6L]

4.1 Introduction, Nomenclature, structure.
4.2 Reactivity of Carbonyl group, mechanism of Nucleophilic addition to Carbonyl group
4.3 Reactions: mechanism and application of Aldol condensation, Perkin reaction, Cannizaros reaction, Knoevenagel condensation, *Reformatsky* reaction.

Unit 5: Stereochemistry [8L]

5.1 Conformational isomerism – Introduction.
5.2 Representation of conformations of ethane by using Saw- Horse, Fischer (dotted line wedge) and Newmann's projection formulae.
 5.3 Conformations and conformational analysis of ethane and n-butane by Newmann's Projection formula with the help of energy profile diagrams.
5.4 Cycloalkanes relative stability - Baeyer's strain theory, Theory of strainless rings.
5.5 Conformations and stability of cyclohexane and monosubstituted cyclohexanes Cyclohexanol, bromocyclohexane and methyl cyclohexane.
5.6 Locking of conformation in t-butyl cyclohexane.

Reference Books:
1. Morrison, R. T. & Boyd, R. N. *Organic Chemistry*, Dorling Kindersley (India) Pvt.
Ltd. (Pearson Education).
2. Stereochemistry conformation & Mechanism, 9th Edition, By P.S.Kalasi, Publisher: New Age International, 2017
3. Stereochemistry of carbon compounds by Eliel..
4. Stereochemistry of Organic Compounds by D. Nasipuri.
5. Finar, I. L. *Organic Chemistry* (*Volume 1*), Dorling Kindersley (India) Pvt. Ltd.
(Pearson Education).
 6. Finar, I. L. *Organic Chemistry* (*Volume 2)*, Dorling Kindersley (India) Pvt. Ltd.
7. Organic Chemistry. Volume I, II, III by S.M. Mukharjee, S.P. Singh and R.P. Kapoor. Wiley Eastern Limited (New Age International)
8. Advanced Organic Chemistry by, B.S. Bahl, ArunBahl. S.Chand& Company, Ltd.
9. Chemistry by R.L.Madan, S.Chand and Company Ltd.

B. Sc II Practical Course
Total Marks 100
(Credits: 04)

Inorganic Chemistry (Marks 35)
1) Gravimetric Analysis (Any two)
i) Gravimetric estimation of iron as Fe_2O_3 from a solution containing Ferrous ammonium sulphate and free sulphuric acid.
ii) Gravimetric estimation of barium as $BaSO_4$ from a solution containing barium chloride and free hydrochloric acid.
iii) Gravimetric estimation of nickel as $Ni(DMG)_2$ from a solution containing $NiSO_4.7H_2O$ and free sulphuric acid
IV) Gravimetric estimation of aluminium as Aluminium oxinate from a solution containing aluminium sulphate or potash alum and free sulphuric acid.
2) Inorganic Preparations (Any two)
i) Preparations of sodium cuprous thiosulphate
ii) Preparation of tris (ethylene diamine) nickel (II) thiosulphate
iii) Preparation of hexammine nickel (II) chloride
3) Titrimetric Analysis (Any four)
(Calibration of burette, pipette and volumetric flask is essential)
i) Fertilizer analysis : To determine percentage of nitrogen in the given sample of a nitrogenous fertilizer (ammonium sulphate). Known weight of the sample to be taken by the student. For preparing its solution which is to be refluxed with known excess of alkali. Standard HCl solution to be supplied.
ii) Analysis of Synthetic /Commercial Sample : To estimate Magnesium from talcum powder.
iii) Determination of total hardness of water using 0.01M EDTA solution.
(Students should standardize the given EDTA solution by preparing 0.01M $CaCl_2$ solution. using $CaCO_3$ salt.)
iv) Determination of alkali content from antacid tablet using HCl solution .
v) Vinegar Analysis : To estimate amount of acetic acid from vinegar sample
Vi) Estimation of Calcium from chalk : To estimate amount of calcium from the chalk by titrimetric method. (By redox titration using $KMnO_4$ solution)
(Note : These experiments are performed by preparing calibrated sets of burettes, pipettes and volumetric flasks.)
4) Semi-micro qualitative analysis
Analysis of binary mixtures with non interfering cations and anions (at least 6 mixtures to be analyzed)
i) Following anions are to be given :
Cl^-, Br^-, I^-, NO_3^-, CO_3^{--}, SO_4^{--} , S^{--}, BO_3^{---}(insoluble CO_3^{--}, , S^{--}, BO_3^{---} may be given)
ii) Following cations are to be given :
Cu^{+2},Cd^{2+}
Al^{+3}, Fe^{+3}, Cr^{+3}.
Zn^{+2}, Mn^{+2}, Ni^{+2}, Co^{+2}.
Ca^{+2}, Ba^{+2}.
Mg^{+2}.
NH_4^+, K^+
Note:-Use of spot tests to be made whenever possible.
Reference Books:
1. Vogel's text book of Qualitative Inorganic analysis by A. I. Vogel .3 rd and 6th edition
2. Vogel's text book of Quantitative Inorganic Chemistry by A. I. Vogel.
3. Physical Chemistry of Inorganic qualitative analysis by Kuricose & Rajaram.
4. Practical manual in water Analysis by Goyal & Trivedi.

5. Basic Concepts in Analytical Chemistry by S. M. Khopkar. Wiley Eastern Ltd.
6. Practical Chemistry, Physical , Inorganic , Organic and Viva voce by Balwant Rai Satija. Allied Publishers Private Limited.
7. College Practical Chemisty by H. N. Patel, S. R. Jakali, H. P. Subhedar, Miss. S. P. Turakhia. Himalaya Publishing House, Mumbai.
8. College Practical Chemistry by Patel, Jakali, Mohandas, Israney, Turakhia.

Organic Chemistry Practical's (Marks 30)
 A) **Organic Qualitative Analysis**
Identification of at least **Eight** Organic compounds with reactions including two from acids, two from phenols, two from bases and two from neutrals.
Acids – Succinic acid, Phthalic acid, Salicylic acid, Aspirin.
Phenols – Alpha-Naphthol, o-nitrophenol, p-nitrophenol.
Bases – o-,m- and p-nitroanilines, Diphenyl amine.
Neutrals – Urea, Acetanilide, Carbon tetrachloride, Bromobenzene, Methyl acetate, Nitrobenzene, Naphthalene, Anthracene, Acetophenone, Ethyl methyl ketone.
Note : A systematic study of an organic substance involves reactions in the determination of elements and functional group.

B) **Organic Quantitative Analysis**
I) **Estimations**
 1) Estimation of ester.
2) Estimation of acetone.
3) Estimation of vitamin C.
II) **Organic preparations**
1) p-nitro acetanilide from acetanilide.
2) Acetanilide from aniline using anhydrous $ZnCl_2$ and Zn dust.
3) Phthalimide from phthalic anhydride.
 4) Benzoic acid from benzamide.
 iii) **Demonstration of Thin layer chromatography**. Separation, identification and determination of R_f values
Reference Books :
1. Practical Organic Chemistry by A.I. Vogel.
2. Hand book of Organic qualitative analysis by H.T. Clarke.
3. A Laboratory Hand Book of Organic qualitative analysis and separation by V.S. Kulkarni. Dastane Ramchandra& Co.
4. Practical Organic Chemistry by F.G. Mann and B.C. Saunders. Low – priced Text Book. ELBS. Longman
5. Advanced Practical Organic Chemistry by N.K. Vishnoi. Vikas Publishing House Private Limited.
6. Advanced practical chemistry by J. Singh, L. D. S. Yadav, R. K. P. singh, I. R. Siddiqui et.al, Pragati prakashan.

Practicals Physical chemistry (Marks 25 + Journal 10)
1) To study the hydrolysis of methyl acetate in presence of HCl and H_2SO_4 and
    to determine the relative strength of acids.
2) To study the effect of acid strength on hydrolysis of an ester by using 0.5M
     HCl and 0.25M HCl.
3) To study the reaction between potassium persulphate and potassium iodide in
     solution with equal concentration of the reactants.
4) To study the reaction between potassium persulphate and potassium iodide in
     solution with unequal concentration of the reactants.
5) To determine the degree of dissociation and dissociation constant of acetic acid
  at various dilutions and to verify Ostwald's dilution law conductmetrically.
6) To determine the normality of the given strong acid by titrating it against the
   strong alkali conduct metrically.
7) To determine the normality of the given weak acid by titrating it against the
   strong alkali conductometrically.
8) To determine the percentage composition of a given liquid mixture by viscosity
   method (Density data to be given).

9) To determine the specific and molar refractions of benzene, toluene and xylene by Abbe's Refractometer and to determine the refraction of CH_2 Group (Methylene group) (Densities should be determined by students).

10) To determine the specific rotation and unknown concentration of sugar solution.

Reference Books: -

1) Mendham, J.Vogel's Quantitative Chemical Analysis, Pearson 2009.

2) Khosla,B.D.; Garg, V.C. &Gulati, A. Senior Practical Physical Chemistry, R. Chand & Co: New Delhi (2011).
3) Findlay' Practical Physical Chemistry (Longmann) 2015.
4) Practical Physical Chemistry: Gurtu (S. Chand) 2014.
5) Systematic Experimental Physical Chemistry: Rajbhoj, Chandekar (Anajali Publication) 2016.
6) Advanced Practical Physical Chemistry: J.B.Yadav (Goel Publishing House) 2015.

B.Sc. II Revised Syllabus 2018-19
Sem.III & IV Nature of Question paper
Total Marks 50

Q.1 a. Answer the following in one sentence. 5
   i)
   ii)
   iii)
   IV)
   V)

b. Choose the correct alternative and rewrite the sentence again 5
   I)
   II)
   III)
   IV)
   V)

Q.2. Attempt any TWO of the following (Out of FOUR) 20
   a)
   b)
   c)
   d)

Q.3. Answer any FOUR of the following (Out of SIX) 20
   a)
   b)
   c)
   d)

e)
f)

SHIVAJI UNIVERSITY, KOLHAPUR.

Accredited By NAAC with 'A' Grade

Revised Syllabus For

B.Sc Part- III

Chemistry

Syllabus to be implemented from

June, 2020 onwards.

INTRODUCTION

This syllabus is prepared to give the sound knowledge and understanding of chemistry to undergraduate students at last year of the B.Sc. degree course. The goal of the syllabus is to make the study of chemistry as stimulating, interesting and relevant as possible. The syllabus is prepared by keeping in mind the aim to make students capable of studying chemistry in academic and industrial courses and to expose the students, to develop interest in them in various fields of chemistry. The new and updated syllabus is based on disciplinary approach with vigour and depth taking care the syllabus is not heavy at the same time it is comparable to the syllabi of other universities at the same level. The syllabus is prepared after discussions of number of faculty members of the subject and by considering the existing syllabi of B.Sc. Part-I, II & III, new syllabi of XIth & XIIth standards, syllabi of NET and SET exams. U.G.C. model curriculum, syllabi of different entrance examination and syllabi of other Universities.

The units of the syllabus are well defined and the scope is given in detail. The periods required for units are given. The lists of reference books are given in detail.

OBJECTIVES

1. To promote understanding of basic facts and concepts in Chemistry while retaining the excitement of Chemistry
2. To make students capable of studying Chemistry in academic and Industrial courses and to expose the students to different processes used in Industries and their applications.
3. To expose the students to various emerging new areas of Chemistry and apprise them with their prevalent in their future studies and their applications in various spheres of chemical sciences.
4. To develop problem solving skills in students.
5. To developed ability and to acquire the knowledge of terms, facts, concepts, processes, techniques and principles of subjects.
6. To develop ability to apply the knowledge of contents of principles of chemistry.
7. To inquire of new knowledge of chemistry and developments therein.
8. To expose and to develop interest in the fields of chemistry
9. To develop proper aptitude towards the subjects
10. To develop the power of appreciations, the achievements in Chemistry and role in nature and society.
11. To develop skills required in chemistry such as the proper handling of appara tus and chemicals

Shivaji University, Kolhapur
B.O.S. in Chemistry
B.Sc. Part – III
Semester CBCS Syllabus
To be implemented from June – 2020

Equivalence

Sr. No.	Title of old paper (Syllabus implemented from June-2015)	Title of new paper (To be implemented from June-2020)
1	Paper – IX & XIII Physical Chemistry	Paper IX DSE-E5 and XIII DSE-F5 Inorganic Chemistry
2	Paper – X & XIV: Inorganic Chemistry	Paper- X DSE-E6 and XIV DSE-F6 Organic Chemistry
3	Paper-XI & XV: Organic Chemistry	Paper XI DSE-E7 and XV- DSE-F7 Physical Chemistry
4	Paper-XII & XVI: Analytical & Industrial Chemistry	Paper XII-DSE-E8 and XVI DSE-F8: Analytical & Industrial Chemistry

A repeater candidate, if any, will be allowed to appear for practical examination as per old course up to March / April 2021 examination.

List of Laboratory Equipments

Apparatus & Equipments

1. Digital balance with 1 mg accuracy
2. Conductometer
3. Potentiometer
4. pH Meter
5. Polarimeter
6. Colorimeter
7. Thermostat
8. Electric Oven
9. Suction Pump
10. Crucible Heater
11. IR Lamp
12. Magnetic stirrer
13. Buckner funnel
14. Water bath / Thermostat.
15. Platinum electrode
16. Glass electrode
17. Silver, Zinc, Copper electrodes
18. Conductivity cell
19. Distilled water plant.
20. Refractometer
21. Freeze
22. Deep Freeze
23. H_2S Apparatus
24. Muffle Furnace
25. Magnetic Stirrer

Glassware & Porcelain ware:

1. Burette (25/50 ml)
2. Micro burette (10 ml)
3. Pipette (5 ml,10 ml,25ml)
4. Graduated Pipette (1/2/5/10 ml)
5. Conical flask(100 ml, 250 ml)
6. Beakers (100 ml, 250 ml, 500 ml)
7. Volumetric flask (25ml,50 ml,100 ml, 250 ml)
8. Gooch Crucible / Sintered glass Crucible
9. Silica Crucible
10. Watch glass
11. Glass tubing
12. Glass Funnel (3")
13. Gas jar
14. Glass rod
15. Test Tubes (12 x100, 5x5x8)
16. Evaporating dish
17. TLC Unit
18. Measuring cylinder
19. Thile's tubes
20. Fusion Tube
21. Capillary tube
22. Stopper bottle
23. Thermometer ($1/10^o$, 360°)
24. Water condenser
25. Distillation flask (100 ml/ 250 ml)
26. Titration tiles.
27. Asbestos sheet.
28. Desiccators
29. Clay pipe triangle

Iron & Wooden ware:

1. Burners
2. Tripod stand
3. Iron stand
4. wire gauze
5. Burette stand
6. Test tube stand
7. Pair of tongs
8. Test tube holder
9. Spatula
10. Copper foil

Chemicals: All the chemicals required for experiments are mentioned in the syllabus.

Others:

1. Filter papers (Kalpi)
2. Whatman Filter paper No. 1, 40, 41 and 42.

Lab Safety Precautions / Measures in Chemistry Laboratory:

Part-I: Personal Precautions

1. All personnel must wear safety Goggles at all times.
2. Must wear the Lab. Aprons / Lab jacket and proper shoes.
3. Except in emergency, an over-hurried activity is forbidden.
4. Fume cupboard must be used whenever necessary.
5. Eating, Drinking and Smoking in the laboratories strictly forbidden.

Part-II: Use of safety and Emergency Equipments –

1. First aid kits.
2. Sand Bucket.
3. Fire extinguishers (dry chemical and carbon dioxide extinguisher).
4. Chemical storage cabinet with proper ventilation.
5. Material safety data sheets
6. Management of local exhaust system and fume hoods.
7. Sign in register if using instruments.

Nature of Theory Question Papers

N.B. The question paper should cover the entire syllabus. Marks allotted to questions should be in proportion to the lectures allotted to respective units.

Papers Semester V: IX-DSE-E5, X-DSE-E6, XI- DSE-E7, XII- DSE-E8,

Semester VI: XIII- DSE-F5, XIV-DSE-F6, XV-DSE-F7 and XVI- DSE-F8

Total Marks 40

Question No.	Details	Marks	Marks of Options
1.	Answer in one sentence (One mark for each question).	4	-
	Multiple choice questions (One mark for each question)	4	-
2.	Long answer type questions (2 out of 3)	20	10
3.	Short answer type questions (3out of 5)	12	08
	Total	40	18

B.O.S. in Chemistry
B.Sc. Part – III
Semester CBCS Syllabus
To be implemented from June – 2020

General Structure

Theory Examination:

There will be four theory papers of 40 marks each for each semester. Their titles and distribution of marks are as follows.

Semester V : Papers IX-DSE-E5, X-DSE-E6, XI- DSE-E7, XII- DSE-E8,

Semester VI: Papers XIII- DSE-F5, XIV-DSE-F6, XV-DSE-F7 and XVI- DSE-F8

Paper – **IX** DSE-E5, **& XIII** DSE-F5: Inorganic Chemistry – 40 marks

Paper – **X** DSE-E6 **& XIV** DSE-F6**:** Organic Chemistry – 40 marks

Paper – **XI** DSE-E7 **& XV** DSE-F7**:** Physical Chemistry – 40 marks

Paper – **XII** DSE-E8 **&XVI** DSE-F8**:** Analytical and Industrial Chemistry – 40 marks

The duration of each theory paper for examination will be of 2 hours

Internal examination (Oral/Seminar/test/home assignment) will be conducted for 10 marks for

each paper.

Practical Examination:

Practical examination will be of 200 marks. The distribution of marks will be as follows:

1.   Physical Section : 60 marks

2.   Inorganic Section : 65 marks

3.   Organic Section : 60 marks

4.   Project : 15 marks

   Total: 200 marks

The duration of practical examination will be of three days – six and half hours per day.

CHEMISTRY

Semester Syllabus for B.Sc.-III

Theory

1. N. B. Figures shown in bracket indicate the total lectures required for the respective topics.

2. The question paper should cover the entire syllabus. Marks allotted to questions should be in proportion to the lectures allotted to respective topics.

3. All topics should be dealt with S.I. units.

4. Study tour/industrial visit/visit to national institute or research laboratory is prescribed.

5. Use of recent editions of reference books is essential.

6. Use of scientific calculator is allowed.

7. **Values required for spectral problems should be provided in the question paper.**

B.Sc. Part III (CBCS) SEMESTER-V
Paper No. DSE-E5, Chemistry Paper No. –IX
(Inorganic Chemistry)
(Theory Credits: 02, 30 hours, 37 lectures)

Expected Learning Outcomes:

Name of the topic	Expected Learning Outcome
1. Acids bases and Non-aqueous solvents	Useful for the study of role of acids and bases in Chemistry. The study of non –aqueous solvents is important to learn all chemical properties of solutes and from the research point of view.
2. Metal ligand bonding in transition metal complexes	Useful to understand geometry, stability and nature of bonding between metal ion and ligand in complexes.
3. Metals, semiconductors and Superconductors	The topic deals with the synthesis and the applications of the semiconductors and Superconductors in electrical and electronic devices.
4. Organometalic compounds	The structure, method of preparation and the applications of organo metallic compound in various fields are explained.
5. Catalysis	The classification, types, mechanism and applications of catalyst in industrial fields is explained.

Unit 1. Acids, Bases and Non aqueous Solvents   **[8]**

1.1 Introduction to theories of Acids and Bases-Arrhenius concept, Bronsted-Lowry

concept, Lewis Concept, Lux-Flood Concept (definition and examples)

1.2 Hard and Soft Acids and Bases. (HSAB Concept)

1.2.1   Classification of acids and bases as hard, soft and borderline.

1.2.2   Pearson's HSAB concept.

1.2.3   Acid–Base strength and hardness-softness.

1.2.4   Applications and limitations of HSAB principle.

1.3 Chemistry of Non aqueous Solvents.

1.3.1   Introduction, definition and characteristics of solvents.

1.3.2   Classification of solvents.

1.3.3   Physical properties and Acid-Base reactions in Liquid Ammonia (NH_3) and

Liquid Sulphur Dioxide (SO_2).

Unit 2. Metal Ligand bonding in Transition Metal Complexes   **[10]**

   2.1 Crystal field theory (CFT)

      2.1.1 Introduction: Shapes of d-orbitals, Basic assumptions of CFT.

      2.1.2 Crystal field splitting of d-orbitals of metal ion in octahedral, tetrahedral, square planar complexes and John-Teller distortion.

      2.1.3 Factors affecting the Crystal field splitting.

      2.1.4 High spin and low spin octahedral complexes w.r.t. Co (II).

      2.1.5 Crystal Field stabilization energy (CFSE), Calculation with respect to octahedral complexes only.

      2.1.6 Limitations of CFT.

   2.2 Molecular orbital theory (MOT).

      2.2.1 Introduction.

      2.2.2 MOT of octahedral complexes with sigma bonding such as $[Ti(H_2O)_6]^{3+}$, $[CoF_6]^{3-}$, $[Co(NH_3)_6]^{3+}$.

      2.2.3 Merits and demerits of MOT.

Unit 3. Metals, Semiconductors and Superconductors.   **[9]**

   3.1 Introduction.

   3.2 Properties of metallic solids.

   3.3 Theories of bonding in metal.

     i. Free electron theory.

     ii. Molecular orbital theory (Band theory).

   3.4 Classification of solids as conductor, insulators and semiconductors on the basis of band theory.

   3.5 Semiconductors- Types - intrinsic and extrinsic and applications of semiconductors.

   3.6 Superconductors: Ceramic superconductors - Preparation and structures of mixed oxide $YBa_2Cu_3O_{7-x}$.

   3.7 Applications of superconductors.

Unit.4. Organometallic Chemistry. [4]

4.1 Definition, Nomenclature of organometallic compounds.

4.2 Synthesis and structural study of alkyl and aryl compounds of Be and Al.

4.3 Mononuclear carbonyls -Nature of bonding in simple mononuclear carbonyls.:$[Ni(CO)_4]$, $[Fe(CO)_5]$, $[Cr(CO)_6]$.

Unit 5. Catalysis [5]

5.1 Introduction

5.2 Classification of catalytic reaction- Homogenous and Heterogeneous

5.3 Types of Catalysis.

5.4 Characteristics of catalytic reactions.

5.5 Mechanism of catalysis.

   i. Intermediate compound formation theory.

   ii. Adsorption theory.

5.6 Industrial applications of catalysis.

Reference Books:

1. Concise Inorganic Chemistry (ELBS, 5th Edition) – J. D. Lee.

2. Inorganic Chemistry (ELBS, 3rd Edition) D. F. Shriver, P. W. Atkins, C. H.Lang Ford, Oxford University Press, 2nd Edition.

3. Basic Inorganic Chemistry : Cotton and Wilkinson.

4. Advanced Inorganic Chemistry (4th Edn.) Cotton and Wilkinson.

5. Concepts and Models of Inorganic Chemistry : Douglas and Mc. Daniel. 3rd Edition. John Wiley publication.

6. Structural principles in inorganic compounds. W. E. Addison.

7. Theoretical principles of Inorganic Chemistry – G. S. Manku.

8. Theoretical Inorganic Chemistry by Day and Selbine.

9. Co-ordination compounds. SFA Kettle.

10. Essentials of Nuclear Chemistry by H. J. Arnikar.

11. Nuclear Chemistry by M. N. Sastri.

12. Organometallic Chemistry by R. C. Mahrotra, A. Sing, Wiley Eastern Ltd.New Delhi.

13. Inorganic Chemistry by A. G. Sharpe, Addision – Wisley Longman – Inc.

14. Principles of Inorganic Chemistry by Puri, Sharma and Kalia, Vallabh Publication. Pitampur Delhi.

15. Text book of Inorganic Chemistry by K. N. Upadhyaya Vikas Publishing House – New Delhi.

16. Inorganic Chemistry 3rd Edn G. L. Miessler and D.A. Tarr, pearson publication.

17. Co-ordination compounds by Baselo and Pearson.

18. UGC Inorganic chemistry by H.C. Khera, Pragati prakashan

19. UGC Advanced Inorganic Chemistry by Agarwal and Keemtilal, Pragati Prakashan

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B.Sc. Part III (CBCS) SEMESTER-V
Paper No. DSE-E6 Chemistry Paper No. X
(Organic Chemistry)
(Theory Credits: 02, 30 hours, 38 lectures)

Expected learning Outcomes:

Name of the topic	Expected Learning Outcome
1. Introduction to Spectroscopy	Understanding of energy associated with electromagnetic radiation and its use in analytical technique.
2.UV-Vis Spectroscopy	Knowledge of chromophore, auxochrome and calculation of $\lambda_{max.}$.
3. IR Spectroscopy	Knowledge of vibrational transitions, regions of IR spectrum, functional group recognition.
4.NMR Spectroscopy	Understanding of magnetic-non magnetic nuclei, shielding-deshielding, chemical shift, splitting pattern
5. Mass spectroscopy.	Knowledge of molecular ion, fragmentation pattern and different types of ions produced.
6. Combined Problems based on UV-Vis, IR, NMR and Mass Spectral data	Student will predict the structure of organic compound with the help of provided spectral data.

Unit 1. Introduction to Spectroscopy   [03]

   1.1 Meaning of spectroscopy.

   1.2 Nature of electromagnetic radiation: wavelength, frequency, energy, amplitude, wave number and their relationship.

   1.3 Different units of measurement of wavelength and frequency.

   1.4 Different regions of electromagnetic radiations.

   1.5 Interaction of radiation with matter: absorption, emission, fluorescence and scattering.

   1.6 Types of spectroscopy and advantages of spectroscopic methods.

   1.7 Energy types and energy levels of atoms and molecules.

Unit 2. UV-Vis Spectroscopy   [05]

   2.1 Introduction.

   2.2 Beer-Lambert's law, absorption of UV radiation by organic molecules leading to different excitations.

   2.3 Terms used in UV Spectroscopy: Chromophore, Auxochrome, Bathochromic shift, hypsochromic shift, hyperchromic and hypochromic effect.

   2.4 Modes of electromagnetic transitions.

   2.5 Effect of conjugation on position of UV band.

   2.6 Calculation of λ_{max} by Woodward and Fischer rules for dienes and enones.

   2.7 Colour and visible spectrum.

   2.8 Applications of UV Spectroscopy.

Unit 3. IR Spectroscopy   [06]

   3.1 Introduction.

   3.2 Principles of IR Spectroscopy.

   3.3 Instrumentation, schematic diagram.

   3.4 Fundamental modes of vibrations, types and calculation.

   3.5 Conditions for absorption of IR radiations.

   3.6 Regions of IR spectrum, fundamental group region, finger print region.

   3.7 Hook's Law for Calculation of vibrational frequency.

   3.8 Factors affecting IR absorption frequency.

3.9 Characteristic of IR absorption of following functional groups a) alkanes, alkenes, alkynes b) alcohol and phenols c) ethers d) carbonyl compounds e) amines f) nitro compounds and g) aromatic compounds.

Unit 4. NMR Spectroscopy [09]
- 4.1 Introduction.
- 4.2 Principles of PMR Spectroscopy.
- 4.3 NMR- Instrumentation, Schematic diagram.
- 4.4 Magnetic and nonmagnetic nuclei.
- 4.5 Chemical shift: definition, measurement, calculation, Factors affecting Chemical shift.
- 4.6 Shielding & deshielding.
- 4.7 Peak Integration.
- 4.8 Merits of TMS as PMR reference compound.
- 4.9 Coupling Constant.
- 4.10 Types of Coupling Constant.
- 4.11 Spin-spin splitting (n+1 rule).
- 4.12 Applications.

Unit 5. Mass Spectroscopy. [08]
- 5.1 Introduction.
- 5.2 Principles of mass spectroscopy.
- 5.3 Mass spectrometer - schematic diagram.
- 5.4 Types of ions produced during fragmentation.
- 5.5 Nitrogen rul
- 5.6 Fragmentation patterns of: alkanes, alkenes, aromatic hydrocarbons, alcohols, phenols, amines and carbonyl compounds.
- 5.7 McLaffrety rearrangement.
- 5.8 Applications.

Unit 6. Combined Problems based on UV, IR, NMR and Mass Spectral data. [07]

Reference Books: (Use recent editions)

1. Absorption Spectroscopy of Organic Molecules by V.M.Parikh.

2. Spectroscopy of Organic compounds by P. S. Kalsi.

3. Elementary Organic Absorption Spectroscopy by Y. R. Sharma.

4. Instrumental Methods of Analysis (7th edition) by Willard, Merritt, Dean, Settle.

5. Spectroscopy by G. R. Chatwal and S. K. Anand

6. Spectroscopy by Pavia, lampman, Kriz,Vyvyan

7. Organic Spectroscopy (2nd edition) by JagMohan

8. Organic Spectroscopy (3rd edition) by William Kemp

9. Instrumental Methods of Chemical Analysis by H. Kaur

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B.Sc.-III (CBCS) SEMESTER V
Paper No. DSE- E7 Chemistry Paper No. XI
(Physical Chemistry)
(Theory Credits: 02, 30 hours, 38 lectures)

Expected learning Outcomes:

Name of the Topics	Expected Learning Outcome
1. Elementary quantum mechanics	Learning and understanding quantum Chemistry, Heisenberg's uncertainty principle, concept of energy operators (Hamiltonian), learning of Schrodinger wave equation. Physical interpretation of the ψ and ψ^2. Particle in a one dimensional box
2. Spectroscopy	Knowledge about spectroscopy, Electromagnetic spectrum, Energy level diagram, Study of rotational spectra of diatomic molecules: Rigid rotor model, Microwave oven, vibrational spectra of diatomic molecules, simple Harmonic oscillator model, Raman spectra: Concept of polarizability, pure rotational and pure Vibrational Raman spectra of diatomic molecules, related knowledge will be gained by the students.
3. Photochemistry	Learning and understanding photochemical laws, reactions and various photochemical phenomena.
4. Solution	Learning the various types of solutions, relations vapour pressure, temperature relations.
5. Electromotive force	Learning and understanding the knowledge of emf measurements, types of electrodes, different types of cells, various applications of emf measurements.

Unit 1. Elementary quantum mechanics [08]

1.1 Introduction.

1.2 Drawbacks of classical mechanics, Black body radiation, Photoelectric effect, Compton effect, Duel nature of matter and energy: De Broglie hypothesis.

1.3 The Heisenberg's uncertainty principle.

1.4 Concept of energy operators (Hamiltonian).

1.5 Derivation of Schrodinger wave equation, well behaved function.

1.6 Physical interpretation of the ψ and ψ^2.

1.7 Particle in a one dimensional box.

1.8 Numerical problems.

Unit 2. Spectroscopy [08]

2.1 Introduction.

2.2 Electromagnetic radiation.

2.3 Interaction of radiation with matter, Electromagnetic spectrum, Energy level diagram.

2.4 Rotational spectra of diatomic molecules: Rigid rotor model, moment of inertia, energy levels of rigid rotor, selection rules, Intensity of spectral lines, determination of bond length, isotope effect, Microwave oven

2.5 Vibrational spectra of diatomic molecules: Simple Harmonic oscillator model, Vibrational energies of diatomic molecules, Determination of force constant, overtones.

2.6 Raman spectra: Concept of polarizability, pure rotational and pure Vibrational Raman spectra of diatomic molecules, selection rules.

2.7 Comparative study of IR and Raman spectra, rule of mutual exclusion- CO_2 molecule.

2.8 Numerical problems.

Unit 3. Photochemistry [06]

3.1 Introduction, Difference between thermal and photochemical processes.

3.2 Laws of photochemistry: i) Grotthus - Draper law ii) Lambert law iii) Lambert – Beer's law (with derivation) iv) Stark-Einstein law.

3.3 Quantum yield, Reasons for high and low quantum yield.

3.4 Factors affecting Quantum yield.

3.5 Photosensitized reactions – Dissociation of H_2, Photosynthesis.

3.6 Photodimerisation of anthracene, decomposition of HI and HBr.

3.7 Jablonski diagram depicting various processes occurring in the excited state: Qualitative description of fluorescence and phosphorescence.

3.8 Chemiluminescence, Electroluminescence and Bioluminescence.

3.9 Numerical problems.

Unit 4. Solutions [06]

4.1 Introduction.

4.2 Ideal solutions, Raoult's law, Vapour pressure of ideal and non ideal solutions of miscible liquids.

4.3 Composition of liquid and vapour, vapour pressure and boiling point diagrams of miscible liquids. Distillation of miscible liquid pairs.

Type I : Systems with intermediate total vapour pressure (i.e. System in which b.p. increases regularly – Zeotropic).

Type II : Systems with a maximum in the total vapour pressure (i.e. System with a b.p. minimum – Azeotropic).

Type III : Systems with a minimum in the total vapour pressure (i.e. System with a b.p. Maximum – Azeotropic).

4.4 Solubility of partially miscible liquids.

   i.   Maximum solution temperature type: Phenol – water system.

   ii.   Minimum solution temperature type: Triethyl amine – water system.

   iii. Maximum and minimum solution temperature type: Nicotine – water system.

Distillation of partially miscible liquid pairs.

4.5 Vapour pressure and distillation of immiscible liquids, steam distillation.

Unit 5. Electromotive force [10]

(Convention: Reduction potentials to be used)

5.1 Introduction

5.2 Thermodynamics of electrode potentials, Nernst equation for electrode and cell potentials in terms of activities.

5.3 E.M.F. series.

5.4 Types of electrodes: Description in terms of construction, representation, half cell reaction and emf equation for

   i)   Metal – metal ion electrode.

   ii)   Amalgam electrode.

   iii)   Metal – insoluble salt electrode.

   iv)   Gas – electrode.

   v)   Oxidation – Reduction electrode.

5.5 Reversible and Irreversible cells.

   i.   Chemical cells without transference.

   ii.   Concentration cells with and without transference.

   iii.   Liquid – Liquid junction potential: Origin, elimination and determination.

5.6 Equilibrium constant from cell emf, Determination of the thermodynamic parameters such as ΔG, ΔH and ΔS.

5.7 Applications of emf measurements :

   i.   Determination of pH of solution using Hydrogen electrode.

   ii.   Solubility and solubility product of sparingly soluble salts (based on concentration cells).

5.8 Numerical problems.

Reference Books:

1. Physical Chemistry by G. M. Barrow, International student Edition, Mc Graw Hill.

2. University General Chemistry by C.N.R. Rao, Macmillan.

3. Physical Chemistry by, R. A. Alberty, Wiley Eastern Ltd.

4. The Elements of Physical Chemistry by P. W. Atkins, Oxford.

5. Principles of Physical Chemistry by S. H. Maron, C. H. Prutton, 4thE dition.

6. Nuclear and Radiochemistry by Friedlander, Kennedy and Miller, John Wiley and Sons. Wiley International edition.

7. Essentials of Nuclear Chemistry by H. J. Arnikar, 4th edition. Wiley Eastern.

8. Principles of Physical Chemistry by Puri, Sharma, Pathania,Shobhanlal Naginchand and Company, Jalandar.

9. Instrumental methods of chemical analysis by Chatwal and Anand,5th Edition, Himalaya Publication.

10. Fundamentals of molecular spectroscopy by C. N. Banwell – Tata Mc Graw-Hill.

11. Quantum Chemistry including molecular spectroscopy by B. K. Sen,Tata Mc Graw -Hill.

12. Text Book of Physical Chemistry by S. Glasstone, Macmillan India Ltd.

13. Elements of Physical Chemistry by D. Lewis and S. Glasstone (Macmillan).

14. Principles of Physical Chemistry by Maron and Lando (Amerind).

15. Electrochemistry by S. Glasstone.

16. Physical Chemistry by W. J. Moore.

17. Basic Chemical Thermodynamics by V. V. Rao (Macmillan).

18. Essential of Physical Chemistry, Bahl and Tuli (S. Chand).

19. Text Book of Physical Chemistry, Soni and Dharmarha.

20. Advanced Physical Chemistry Gurdeep Raj GOEL Publishing House, 36th Edition

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B.Sc. Part III (CBCS) SEMESTER-V
Paper No. DSE-E8 Chemistry paper No. XII
(Analytical Chemistry)
(Theory Credits: 02, 30 hours, 38 lectures)

Expected learning Outcomes:

Name of the topic	Expected Learning Outcome
1.Theory of Gravimetric Analysis	Learning and understanding the techniques of gravimetric analysis.
2.Flame Photometry	Knowledge of instrumental analysis of alkali and alkaline earth elements.
3.Colorimetry and Spectrophotometry	Understanding, working and applications of optical methods as an analytical tool.
4.Potentiometric titrations	Understanding theory and applications of potentiometric titrations.
5.Chromatographic techniques and Quality control	Understanding the basics of ion exchange and column adsorption chromatography, Quality control practices in analytical industries / laboratories.

Unit 1. Theory of Gravimetric Analysis   [08]

1.1 Introduction.

1.2 Gravimetric analysis by precipitation: nucleation, crystal growth, digestion/ageing, filtration, drying, ignition, weighing.

1.3 Optimum conditions for good precipitation.

1.4 Physical nature of precipitate.

1.5 Purity of precipitate: co-precipitation, post-precipitation.

1.6 Organic precipitants and their applications.

Unit 2. Flame Photometry   [06]

2.1 Introduction.

2.2 General principles of flame photometry.

2.3 Instrumentation: Block diagram, Burners (Premix and Lundergraph burners), mirror, slits, filters, detector (Photomultiplier tube).

2.4 Effect of solvent in flame photometry.

2.5 Experimental procedure of analysis (Standard addition and internal standard).

2.6 Interferences and Factors that influence the intensity of emitted radiation in a flame photometer.

2.7 Applications of flame photometry in real sample analysis.

2.8 Limitations of flame photometry.

Unit 3. Colorimetry and Spectrophotometry [06]

3.1 Theory of colorimetry and spectrophotometry.

3.2 Lambert Beer's law, deviation from Beer's law.

3.3 Terms used in colorimetry and spectrophotometry.

3.4 Classification of methods of 'colour' measurement or comparison.

3.5 Photoelectric colorimeter method–Single beam photo-electric colorimeter.

3.6 Spectrophotometer method–Single beam direct reading spectrophotometer.

3.7 Determination of unknown concentration by using concentration-absorbance plot.

3.8 Applications of colorimetry and spectrophotometry.

Unit 4. Potentiometric titrations [07]

4.1 Introduction.

4.2 Determination of pH.

4.3 Study of Quinhydrone and Glass electrodes and their use in determination of pH.

4.4 Potentiometric titrations: Classical and analytical methods for locating end points.

4.5 Acids- Bases titration with suitable example.

4.6 Redox titration with suitable example.

4.7 Precipitation titration with suitable example.

4.8 Basic circuit of direct reading potentiometer.

4.9 Advantages of potentiometric titrations.

Unit 5. Chromatographic techniques and Quality control [10]

5.1 Introduction, classification.

5.2 **Column chromatography:** Introduction, types, Principle of adsorption column chromatography, solvent system, stationary phases, Methodology-Column packing, applications of sample, development, detection methods, recovery of components, Applications.

5.3 **Ion exchange chromatography:** Introduction, Principle, Types and properties of ion exchangers, Methodology-Column packing, application of sample, elution, detection/analysis, Applications.

5.4 **Concepts in Quality control**

    i. Introduction and Concept of quality.

    ii. Quality control.

    iii. Quality assurance.

    iv. ISO series.

    v. Good laboratory practices.

References

1. Text Book of Quantitative inorganic analysis – A.I.Vogel.

2. Instrumental methods of chemical analysis –Willard, Merit & Dean.

3. Instrumentals methods of chemical analysis – Chatwal & Anand.

4. Vogel's textbook of qualitative inorganic analysis – Bassett, Denny etc.

5. Textbook of qualitative inorganic analysis – Kolthoff and Sandel.

6. Fundamentals of analytical chemistry – Skoog and West.

7. Basic concepts of analytical chemistry – S.M. Khopkar.

8. Text book of qualitative chemical analysis – Vogel.

9. Handbook of quality assurance for the analytical chemistry laboratory – James P.Dux,Van Nostrand Reinhold,New York 1986.

10. Instrumental methods of chemical analysis – H.Kaur.

11. A text book of Quantitative chemical analysis Vogel's by J.Mendham, R. C. Denney.

12. Quantitative Chemical Analysis – Daniel C. Harris.

13. Applying ISO 9000 Quality management system, International trade centre publishing genera, Indian edition printed by D. L. Shaha Trust.

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Expected Learning Outcome

Name of the topic	Expected Learning Outcome
1.Coordination Chemistry	The topic focused on the mechanism of the reactions involved in inorganic complexes of transition metals. The students can understand the thermodynamic and kinetic aspects of metal complexes.
2.Nuclear Chemistry	The generation of nuclear power with the help of nuclear reactions is highlighted. Role of radio isotopes in medicinal, industrial and Archaeology fields is explained.
3.Chemistry of f-block Elements	The characteristics, properties and separation of lanthanides and Actinides are discussed. Synthesis and IUPAC Nomenclature of trans uranic elements (TU) explained.
4.Iron and Steel	The techniques involve in ore dressing and extraction of cast iron from its ore are discussed.
5.Bio –inorganic Chemistry	Role of various metals and non metals in our health are discussed.

Unit 1. Coordination Chemistry [12]

A. Inorganic Reaction mechanism

1.1 Introduction.

1.2 Classification of Mechanism: Association, dissociation, interchange and the rate

determining steps.

1.3 $S_N{}^1$ and $S_N{}^2$ reactions for inert and labile complexes.

1.4 Mechanism of substitution in cobalt (III) octahedral complexes.

1.5 Trans effect and its theories.

1.6 Applications of trans effect in synthesis of Pt (II) complexes.

B. Thermodynamic and Kinetic aspects of metal complexes.

1.7 Introduction.

1.8 Thermodynamic stability.

1.9 Kinetic Stability.

1.10 Relation between thermodynamic and kinetic stability.

1.11 Stepwise stability constant.

1.12 Factor affecting the stability of complexes.

1.13 Determination of Stability constant by Job variation, Mole ratio and Slope ratio method.

Unit 2. Nuclear Chemistry [05]

2.1 Nuclear reactions and energetic of nuclear reactions.

2.2 Types of nuclear reactions

   i. Artificial transmutation.

   ii. Artificial radioactivity.

   iii. Nuclear fission and its application in heavy water nuclear reactor.

   iv. Nuclear fusion.

2.3 Use of Thorium, Uranium and Plutonium in atomic energy

2.4 Applications of radio-isotopes as tracers.

   i. Chemical investigation – Esterification.

   ii. Structural determination – Phosphorus pentachloride.

   iii. Analytical Chemistry – Isotopic dilution method for determination of volume of blood.

   iv. Age determination – Dating by C^{14}.

Unit 3. Chemistry of f- Block Elements [09]

A] Lanthanides

3.1 Introduction.

3.2 Occurrence.

3.3 Electronic Configuration.

3.4 Oxidation State.

3.5 Lantahnide contraction.

3.6 Separation of Lanthanides by Ion exchange method.

B] Actinides

3.7 Position in periodic table.

3.8 Electronic configuration.

3.9 General methods of preparation of transuranic elements.

   i. Neutron capture – followed by β decay.

   ii. Accelerated projectile bombardment.

   iii. Heavy ion bombardment.

3.10 IUPAC nomenclature of the super heavy elements with atomic number (Z) greater than 100.

Unit 4. Iron and Steel. [07]

4.1 Occurrence and ores of iron.

4.2 Definition of the Terms- Ore , Mineral, Slag, Flux, Gangue , Matrix, Calcinations, Reduction, Roasting, Smelting and Leaching.

4.3 Extraction of iron by Blast furnace.

4.4 Steel: Definition and types.

4.5 Conversion of cast iron into steel by

   i. Bessemer process.

   ii. L.D. process.

4.6 Heat treatment on steel.

Unit 5. Bio-inorganic Chemistry. [05]

5.1 Introduction.

5.2 Essential and trace elements in biological process.

5.3 Metalloporphyrins with special reference to hemoglobin and myoglobin.

5.4 Biological role of alkali and alkaline earth metal ions with special referenc to Na^+, K^+ and Ca^{2+}

Reference Books: (Use recent editions)

1. Concise Inorganic Chemistry (ELBS, 5th Edition) – J. D. Lee.

2. Inorganic Chemistry (ELBS, 3rd Edition) D. F. Shriver, P. W. Atkins, C. H.Lang Ford, Oxford University Press, 2nd Edition.

3. Basic Inorganic Chemistry : Cotton and Wilkinson.

4. Advanced Inorganic Chemistry (4th Edn.) Cotton and Wilkinson.

5. Concepts and Models of Inorganic Chemistry : Douglas and Mc. Daniel. 3rd Edition. John Wiley publication.

6. Structural principles in inorganic compounds. W. E. Addison.

7. Theoretical principles of Inorganic Chemistry – G. S. Manku.

8. Theoretical Inorganic Chemistry by Day and Selbine.

9. Co-ordination compounds. SFA Kettle.

10. Essentials of Nuclear Chemistry by H. J. Arnikar.

11. Nuclear Chemistry by M. N. Sastri

12. Organometallic Chemistry by R. C. Mahrotra A. Sing, Wiley Eastern Ltd.New Delhi.

13. Inorganic Chemistry by A. G. Sharpe, Addision – Wisley Longman – Inc.

14. Principles of Inorganic Chemistry by Puri, Sharma and Kalia, Vallabh Publication. Pitampur Delhi.

15. Text book of Inorganic Chemistry by K. N. Upadhyaya Vikas Publishing House – New Delhi.

16. Inorganic Chemistry 3rd edn G. L. Miessler and D.A. Tarr, pearson publication

17. Co-ordination compounds by Baselo and Pearson.

18. UGC Inorganic chemistry by H.C. Khera, Pragati prakashan

19. UGC Advance Inorganic Chemistry by Agarwal and Keemtilal, Pragati Prakashan

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B.Sc. Part III (CBCS) SEMESTER-VI
Paper No. DSE-F6 Chemistry Paper No. XIV
(Organic Chemistry)
(Theory Credits: 02, 30 hours, 38 Lectures)

Expected learning Outcomes:

Name of the topic	Expected Learning Outcome
1. Reagents and Reactions in Organic Synthesis	Knowledge of reagents used in organic transformations and various reactions used in organic synthesis.
2.Retrosynthesis	Knowing basic terms used in retrosynthetic analysis, retrosynthesis of some organic compounds.
3.Electrophilic addition to >C=C< and −C≡C− bond	Student will learn addition reaction across >C=C< bond w.r.t. hydrohalogenation, hydration hydroxylation, ozonolysis and addition of halogen, halogen acid, hydrogen,water, etc. across −C≡C−bond.
4.Natural Products	Knowledge of terpenoids and alkaloids w.r.t. occurrence, isolation, characteristics and classification. Analytical and synthetic evidences of Citral and Nicotine.
5.Pharmaceuticals	Understanding classification of drugs, Qualities of ideal drug. Synthesis and uses of some representative drugs and Drug action of sulpha drugs.

Unit 1. Reagents and Reactions in Organic Synthesis [10]

A] Reagents

 Preparation and Applications of following reagents.

1. Lithium aluminium hydride $LiAlH_4$.
2. Raney Nickel.
3. Osmium tetraoxide.

4. Selenium dioxide (SeO_2).

5. Dicyclohexyl Carbodiimide (DCC).

6. Diazomethane.

B] Reactions

Statement, General Reaction, Mechanism and Synthetic applications

1. Diels -Alder reaction.

2. Meerwein –Pondorff-Verley reduction.

3. Hofmann rearrangement.

4. Wittig reaction.

5. Wagner- Meerwein rearrangement.

6. Baeyer Villiger oxidation.

7. Problem based on above reactions.

Unit 2. Retrosynthesis   **[06]**

2.1 Introduction.

2.2 Recapitulation of basics of reaction mechanism and reagents.

2.3 Terms used- Target molecule (TM), Disconnection, Synthons, Synthetic equivalence, Functional group interconversion (FGI), one group disconnection (w. r. t. suitable examples).

2.4 Retrosynthetic analysis and synthesis of target molecules: Cinnamaldehyde, Cyclohexene, para methoxy acetophenone, Methyl-3-phenyl propionate, α,α-dimethyl benzyl alcohol, Paracetamol.

Unit 3. Electrophilic addition to >C=C< and −C≡C− bonds   **[08]**

  A.   Addition to Carbon-Carbon double (>C=C<) bond:

3.1 Introduction.

3.2 Examples of addition reactions.

3.3 Mechanism of electrophilic addition to >C=C< bond, orientation & reactivity,

   i.   Hydrohalogenation.

   ii.   Anti-Markovnikoff's addition (peroxide effect).

   iii.   Rearrangements (support for formation of carbocation).

iv.   Addition of halogens.

v.   Addition of water.

vi.   Addition of hypohalous acids (HO-X).

vii.   Hydroxylation (formation of 1,2-diols).

viii.   Hydroboration-oxidation (formation of alcohol).

ix.   Hydrogenation (formation of alkane).

x.   Ozonolysis (formation of aldehydes & ketones).

B.   Addition to Carbon-Carbon triple ($-C\equiv C-$) bond:

3.4 Introduction.

3.5 Examples of addition reactions.

3.6 Mechanism of electrophilic addition to$-C\equiv C-$bond.

i.   Addition of halogens.

ii.   Addition of halogen acids.

iii.   Addition of hydrogen.

iv.   Addition of water.

v.   Formation of metal acetylides.

Reference books:

1. Organic Reactions and Their Mechanisms P. S. Kalsi 3rd Revised edition.

2. Advanced organic Chemistry by B.S. Bahl & Arun Bhal (Reprint in 1997)

3. Organic Chemistry by Morrison and Boyd 6[th]edition.

Unit 4. Natural Products   [08]

A] Terpenoids:

4.1 Introduction, Occurrence, Isolation, General Characteristic, Classification.

4.2 General Methods for structure determinations.

4.3 Isoprene rule.

4.4 Analytical evidences and synthesis of Citral.

B] Alkaloids:

4.5 Introduction, Occurrence, Isolation, Classification, Properties.

4.6 General Methods for structure determination.

4.7 Analytical evidences and synthesis of Nicotine.

Unit 5. Pharmaceuticals   **[06]**

  5.1 Introductio.

  5.2 Classification.

  5.3 Qualities of ideal drug.

  5.4 Synthesis   and uses of ethambutal, phenobarbitone, isoniazide, benzocaine, Chloramphenicol,paludrine.

  5.5 Drug action of sulpha drugs.

Reference books:1

1. Advanced Organic Chemistry : Reactions, Mechanisms and structure by – Jerry March.

2. Reagents for Organic Synthesis by Louis F. Fieser , Mary Fieser -1967.

3. A Text book of Practical Organic Chemistry including Qualitative Organic Analysis by A. I.Vogel.

4. Mechanism and Structure in Organic Chemistry. April,1963 By Edwin S.Gould.

5. A text book of Organic Chemistry by Arun Bahl, B.S.Bhal Eighteenth Revised edition 2006.

6. A guidebook to mechanism in Organic Chemistry sixth Edition by Peter Syke.

7. Organic Synthesis: The Disconnection Approach by Stuart Warren.

8. Organic Synthesis Through Disconnection Approach by P. S. Kalsi

9. Fundamentals of Organic Synthesis the Retrosynthetic Analysis by Ratan Kumar Kar

10. Organic Reactions and Their Mechanisms P. S. Kalsi 3rd Revised edition.

11. Advanced organic Chemistry by B.S. Bahl & Arun Bhal (Reprint in 1997)

12. Organic Chemistry by Morrison and Boyd 6[th]edition.

13. Organic Chemistry Vol II Stereochemistry and the Chemistry of Natural Products (5th ed) by I. L.Finar.

14. Organic Chemistry Natural Products Vol I, by O. P.Agrawal

15. Industrial Chemistry-B.K. Sharma, Goyal publishing house,Mirut

16. Shreeves chemical process industries 5th Edition, G.T. Oustin, McGrawHill

17. Riegel`s hand book of Industrial chemistry, 9th Edition, Jems A.Kent

18. Industrial chemistry –R.K. Das, 2nd Edition,1976.

19. Synthetic drugs by M.S.Yadav,Campus book international.

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B.Sc. III (CBCS) SEMESTER-VI
Paper No. DSE-F 7 Chemistry Paper No. XV
(Physical Chemistry)
(Theory Credits: 02, 30 hours, 37 Lectures)
Expected Program Outcomes:

Name of the Topics	Expected Learning Outcome
1. Phase equilibria	Learning and understanding of phase rule, learning of One component, Two component and Three component systems phase diagrams with suitable examples.
2. Thermodynamics	Knowledge about basic concept of Thermodyanamics, free energy, Gibbs-Helmholtz equation and its applications, problem related with it.
3. Solid state chemistry	Learning and understanding Space lattice, lattice sites, Lattice planes, Unit cell. Laws of crystallography, Weiss indices and Miller indices, Cubic lattices and types of cubic lattice, planes or faces of a simple cubic system, Diffraction of X-rays, Derivation of Bragg's equation. Determination of crystal structure by Bragg's method. crystal structure of NaCl and KCl on the basis of Bragg's equation.
4. Chemical kinetics	Learning of kinetics, Simultaneous reactions such as i)opposing reaction ii)side reaction iii)consecutive reactions: iv) chain reaction v) explosive reaction
5. Distribution law	Learning and understanding the knowledge of distribution law, its modifications, applications of distribution laws, process of extraction, determination of solubility, distribution indicators, molecular weights.

Unit 1. Phase Equilibria   [07]

1.1 Introduction.

1.2 Gibbs phase rule : Phase rule equation and explanation of terms involved in the equation.

1.3 Phase diagram, true and metastable equilibria.

1.4 One component systems:

    i. Water system.

    ii. Sulphur system with explanation for polymorphism.

1.5 Two component systems:

    i. Eutectic system: (Ag – Pb system); Desilverisation of lead.

    ii. Freezing mixture: (KI –H_2O system).

    iii. Formation of compound with congruent melting point ($FeCl_3$ – H_2O).

1.6 Three component solid-liquid system:

    i. Development of triangular phase diagram: (Acetic acid – Chloroform –water system).

Unit 2. Thermodynamics [09]

2.1 Introduction.

2.2 Free energy: Gibbs function (G) and Helmholtz function (A), Criteria for thermodynamic equilibrium and spontaneity.

2.3 Relation between ΔG and ΔH : Gibbs-Helmholtz equation.

2.4 Phase equilibria : Clapeyron – Clausius equation and its applications.

2.5 Thermodynamic derivation of law of mass action, Van't – Hoff isotherm and isochore.

2.6 Fugacity and activity concepts.

2.7 Partial molar quantities, Partial molar volume, Concept of chemical potential, Gibbs-Duhem equation.

2.8 Numerical problems.

Unit 3. The Solid State [09]

3.1 Introduction: Space lattice, lattice sites, lattice planes, unit cell.

3.2 Laws of crystallography:

    i. Law of constancy of interfacial angles

    ii. Law of rational indices

    iii. Law of crystal symmetry.

3.3 Weiss indices and Miller indices.

3.4 Cubic lattice and types of cubic lattice, planes or faces of a simple cubic system, spacing of lattice planes.

3.5 Diffraction of X-rays, Derivation of Bragg's equation.

3.6 Determination of crystal structure by Bragg's method.

3.7 Determination of crystal structure of NaCl and KCl on the basis of Bragg's equation.

3.8 Numerical problems.

Unit 4. Chemical Kinetics [06]

4.1 Introduction.

4.2 Simultaneous reactions such as

   i. Opposing reaction: (Derivation of rate equation for first order opposed by first order expected).

   ii. Side reaction.

   iii. Consecutive reactions.

   iv. Chain reaction.

   v. Explosive reaction (Derivation of rate equation and Numerical problems are not expected).

Unit 5. Distribution law [06]

5.1 Introduction, solute, solvent and solution, miscible and immiscible liquids.

5.2 Nernst distribution law and its limitations.

5.3 Modification of distribution law with respect to change in molecular state of solute (association and dissociation of solute in one of the solvent).

5.4 Applications of the distribution law

   i. Process of extraction (derivation expected).

   ii. Determination of solubility of solute in particular solvent.

   iii. distribution indicators.

   iv. determination of molecular weight of solute in different solvents.

5.5 Numerical problems.

Reference Books:

1. Physical Chemistry by G. M. Barrow, International student Edition,Mc Graw Hill.
2. University General Chemistry by C.N.R. Rao, Macmillan.
3. Physical Chemistry by, R. A. Alberty, Wiley Eastern Ltd.
4. The Elements of Physical Chemistry by P. W. Atkins, Oxford.
5. Principles of Physical Chemistry by S. H. Maron, C. H. Prutton, 4thE dition.
6. Nuclear and Radiochemistry by Friedlander, Kennedy and Miller, John Wiley and Sons. Wiley International edition.
7. Essentials of Nuclear Chemistry by H. J. Arnikar, 4th edition. Wiley   Eastern.
8. Principles of Physical Chemistry by Puri, Sharma, Pathania,Shobhanlal Naginchand and Company, Jalandar.
9. Instrumental methods of chemical analysis by Chatwal and Anand,5th Edition, Himalaya Publication.
10. Fundamentals of molecular spectroscopy by C. N. Banwell – Tata Mc Graw-Hill.
    11. Quantum Chemistry including molecular spectroscopy by B. K. Sen,Tata Mc Graw -Hill.
12. Text Book of Physical Chemistry by S. Glasstone, Macmillan India Ltd.
13. Elements of Physical Chemistry by D. Lewis and S. Glasstone   (Macmillan).
14. Principles of Physical Chemistry by Maron and Lando (Amerind).
15. Electrochemistry by S. Glasstone.
16. Physical Chemistry by W. J. Moore.
17. Basic Chemical Thermodynamics by V. V. Rao (Macmillan).
18. Essential of Physical Chemistry, Bahl and Tuli (S. Chand).
19. Text Book of Physical Chemistry, Soni and Dharmarha.
20. Advanced Physical Chemistry Gurdeep Raj GOEL Publishing House, 36th Edition

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Expected learning Outcomes:

Name of the topic	Expected Learning Outcome
1.Sugar Industry	Learning and understanding the whole process of manufacture of sugar and byproducts of sugar industry.
2.Manufacture of industrial heavy chemicals	Learning and understanding of physico-chemical principles of production of ammonia, sulfuric acid, nitric acid and sodium carbonate along with its manufacturing plant.
3.Synthetic polymers	Understanding and learning the classification, synthesis and applications of various polymers.
4.Petroleum industry and eco-friendly fuels	Understanding the petroleum Industry, fuels and need of use of ecofriendly fuels.
5.Nanotechnology	Understanding and learning of nanotechnology including classification, optical properties, synthesis routes, characterization techniques and applications of nano-materials.

Unit 1. Sugar Industry   [07]

1.1 Introduction.

1.2 Manufacture of cane sugar in India: Extraction of juice, Clarification, Concentration, crystallization, centrifugation and other details of industrial process.

1.3 Byproducts of sugar industry.

1.4 Manufacture of Ethyl Alcohol from Molasses: by Fermentation.

Unit 2. Manufacture of Industrial Heavy Chemicals   [08]

2.1 Introduction

2.2 Manufacture of Ammonia (NH_3)

    i. Physico-chemical principles.

ii. Manufacture by Haber's process.

2.3 Manufacture of Sulphuric acid (H_2SO_4)

  i. Physico-chemical principles.

  ii. Manufacture by Contact process.

2.4 Manufacture of Nitric acid (HNO_3)

  i. Physico-chemical principles.

  ii. Manufacture by Ostwald's process (Ammonia oxidation process).

2.5 Manufacture of Sodium carbonate (Na_2CO_3) (Washing soda).

  i. Physico-chemical principles.

  ii. Manufacture by Solvay process.

Unit 3. Synthetic Polymers [08]

3.1 Introduction.

3.2 Classification.

  i. Based on origin.

  ii. Based on composition-organic, inorganic polymers.

  iii. Based on method of preparation.

  iv. Based on general physical properties.

  v. Based on structure.

3.3 Addition Polymerization: Free radical addition and ionic addition polymerization.

3.4 Zigler Nata polymerization.

3.5 Methods of preparation and applications of some organic polymers: Polyethylene, polystyrene, polyvinyl chloride, Phenol-formaldehyde resin.

3.6 Conducting organic polymers: Synthesis and properties of Polyaniline, polypyrrol.

3.7 Applications of conducting organic polymers.

Unit 4. Petroleum industry and eco-friendly fuels [07]

  A] Petroleum industry

    Introduction, occurrence, composition of petroleum, resources, processing of petroleum, calorific value of fuel, cracking, octane rating (octane number), cetane

number, flash point, petroleum refineries, applications of petrochemicals, synthetic petroleum, lubricating oils & additives.

B] Fuels

Fuels and eco-friendly fuels: liquid, gaseous fuel (LPG, CNG), fossil fuels, diesel, bio diesel, gasoline, aviation fuels. Use of solar energy for power generation.

Unit 5. Nanotechnology [08]

5.1 Introduction of nanotechnology, history, Classification of nanoparticles based on size.

5.2 Optical properties of Nanomaterial's

  i. Semiconducting NPs.

  ii. Metallic NPs.

5.3 Synthetic Routes of nanomaterials: Top-down and bottom-up approaches.

5.4 Synthesis methods: Sol-gel, precipitation, chemical reduction, chemical vapor deposition, hydrothermal, electrodeposition.

5.5 Characterization of nanomaterials: X-Ray diffractometer, Scanning Electron Microscope, Transmission electron microscope.

5.6 Applications of nanotechnology.

References:

1. Industrial Chemistry-B.K. Sharma

2. Chemical process industries – Shrieve & Brink

3. Industrial chemistry – Kent

4. Industrial chemistry – Rogers

5. Industrial chemistry – R. K. Das

6. Mechanical chemistry – Burger

7. Nanotechnology: Principles and Practices – Sulbha Kulkarni

8. The Petroleum chemicals industry by R. F. Goldstine, e &Fn London

9. Fundamentals of petroleum chemical technology by P Below.

10. Petro Chemicals Volume 1 and 2 ; A Chauvel and Lefevrev ; Gulf Publishing company

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Laboratory Course (Practicals)

N. B. (i) Use of Digital/Analytical/Chainometric/Single pan balance is allowed.

(ii) Use of Scientific calculator is allowed.

(iii) Use of Chart/Text book/Hand book of practical is allowed.

(iv) There will be a project having weightage of 15 marks.

Project should be in the following areas but focused on applications of Chemistry.

a) Society oriented

b) Daily use

c) Industry based

d) Analysis based

The project will be assessed by all the three examiners with equal weightage at the time of practical examinations.

The project may be completed individually or by a group of students not exceeding number three.

One copy of the project should be submitted at the time of examination. After assessment this copy will remain in the department.

INORGANIC CHEMISTRY

I) Gravimetric Estimations (G).

N. B. Any **two** experiments from G1 to G3 and any **two** experiment from G4 & G6.

G1. Gravimetric estimation of iron as ferric oxide (Fe_2O_3) from the given solution

containing ferrous ammonium sulphate, copper sulphate and free sulphuric acid.

G2. Gravimetric estimation of zinc as zinc pyrophosphate from the given solution

containing zinc sulphate, ferrous ammonium sulphate and free sulphuric acid.

G3. Gravimetric estimation of barium as barium sulphate($BaSO_4$) from the given solution containing barium chloride, ferric chloride and free hydrochloric acid.

G4. Gravimetric estimation of barium as barium chromate($BaCrO_4$) from the given solution containing barium chloride, ferric chloride and free hydrochloric acid.

G5. Gravimetric estimation of nickel as bis (dimethylglyoximato) nickel (II) from the given solution containing nickel sulphate, ferrous ammonium sulphate and free Sulphuric acid.

G6. Gravimetric estimation of aluminium as aluminium oxinate potassium tris (8-hydroxy quinolato) aluminium (III) from the given solution containing potash alum ,copper sulphate and free sulphuric acid.

[For the gravimetric experiments, stock solution should be given in the range of 10 to 15 cm^3 and asked to dilute to 100 cm^3 (or the stock solution should be given in the range of 20 to 30 cm^3 and asked to dilute to 250 cm^3). Use 50 cm^3 of this diluted solution for estimation.]

II. Inorganic Preparations (P).

N. B. At least **six** preparations from the following with **percentage yield**:

    P1. Preparation of potassium trioxalato aluminate (III).

    P2. Preparation of Tetra ammine copper (II) chloride.

    P3. Preparation of tris(thiourea) copper (I) sulphate.

    P4. Preparation of potassium trioxalato ferrate (III).

    P5. Preparation of chloropenta-ammine cobalt (III) chloride.

    P6. Preparation of ammonium diamminetetrathiocynato chromate (III) (Reineck's salt).

    P7. Preparation of Potassium hexa nitro coblatate (III).

P8. Preparation of ammonium trioxalato chromate (III).

P9. Preparation of hexathiourea plumbus (II) nitrate.

A) Percentage Purity

N. B. : Any **two** from the following.

V1. Determination of percentage purity of ferrous ammonium sulpahte.

V2. Determination of percentage purity of tetrammine copper (II) sulphate.

V3. Determination of percentage purity of potassium (trioxalato-aluminate) (III).

B) Analysis of Commercial Sample.

N. B. Any **Three** from the following:

V5. Determination of percentage of Calcium in the given sample of milk powder or lime.

V6. Determination of amount of aluminum in the given solution of potash alum.

V7. Determination of titrable acidity in the given sample of milk or lassi.

V8. Determination of percentage purity of boric acid using supplied sodium hydroxide. (Standard succinic or oxalic acid solution to be prepared to standardise the given sodium hydroxide solution.)

V9. To determine the amount of HCl in given of commercial samples.

C) Ion exchange method.

N. B. Any **two** from the following.

V10. Determination of amount of sodium present in the given solution of common salt using cation exchange resin (By Acid Base titration).

V11. Determination of amount of magnesium in the given solution containing(Mg^{2+} and Zn^{2+}) using anion exchange resin and standard solution of EDTA.

V12. Determination of amount of zinc in the given solution containing (Mg^{2+} andZn^{2+}) using anion exchange resin and standard solution of EDTA.

Reference Books:

1. A text book of quantitative Inorganic Analysis - A. I. Vogel.

2. Text book of Quantitative Inorganic Analysis - Kolthoff and Sandell.

3. Experimental Inorganic Chemistry - Palmer W. G.

4. Advanced Practical Inorganic Chemistry - Adams and Raynor.

5. Manual in Dairy Chemistry - I.C.A.R. Sub-Committee on Diary Education.

6. Chemical methods for environmental analysis - R. Ramesh and M. Anbu.

ORGANIC CHEMISTRY

I) Qualitative analysis

Separation of binary mixture and Identification of **one** component. (At least 08 mixtures)

Nature   1) Solid – Solid   : 4 mixtures

     2) Solid – Liquid   : 2 mixtures

     3) Liquid – Liquid   : 2 mixtures

1) Solid – Solid Mixtures:

One mixture from each the following types should be given:

    i) Acid+Phenol   ii) Acid + Base

    iii) Acid+Neutral   iv) Phenol +Base

    v) Phenol+Neutral   vi) Base +Neutral

2) Solid – Liquid Mixtures

   Mixture of type Neutral + Neutral or Acid + Neutral should be given.

3) Liquid – Liquid Mixtures

   Mixture of type Neutral + Neutral or Base + Neutral should be

  Given. Following compounds should be used for preparation of mixtures

i) Acids: Benzoic acid, Phthalic acid, Salicylic acid, Cinnamic acid, Aspirin, Oxalic acid.

ii) Phenols: α-naphthol, β-naphthol.

iii) Bases:o-nitroaniline, m-nitroaniline, p-nitroaniline, aniline, o-toluidine and N, N-
   dimethylaniline.

iv) Neutrals: Anthracene, acetanilide, m-dintrobenzene, chloroform, carbon tetrachloride,
   acetone, nitrobenzene, ethyl acetate, ethyl benzoate, bromobenzene, urea and
   thiourea.

NB :

1. For Solid-Liquid and Liquid-Liquid mixtures avoid detection of type of mixture.
   Instead the weightage is given to detection of nature and separation ofmixture.

2. Separation and qualitative analysis of the binary Mixtures should be carried out on
microscale using microscale kits.

II) Quantitative analysis: Organic Estimations:(Any four)

1. Estimation of sucrose

2. Saponification value of oil.

3. To determine the amount of acid and amide present in the given mixture of acid and
   amide.

4. Determination of Molecular weight of monobasic/dibasic acid by volumetric method.

5. Estimation of unsaturation –to estimate the percentage purity of given olefinic
   compound by brominationmethod.

Note: Double burette method should be used for titration.

III) Organic Preparations: (Any four)

1. Multicomponent reaction - Preparation of Dihydropyrimidone.

2. Radical coupling reaction - Preparation of 1,1,2 bis-2naphthol.

3. Base catalyzed Aldol condensation- Preparation of Dibenzal propanone.

4. Diels Alder reaction- Reaction between Furan and Maleic acid

5. Benzil- Benzilic acid rearrangement reaction

6. Oxidation reaction – Preparation of Methyl phenyl sulfone.

IV) Preparation of Derivatives:

1. Picrate derivative (naphathalene and α-naphthol).

2. Iodoform (Acetone).

3. Osazone of Carbohydrates (Glucose).

4. Oxalate derivative (ofUrea).

5. Nitrate derivative of Urea

6. 2,4-Dinitro phenyl hydrazone (carbonyl compounds)

7. Oxime derivatives (carbonyl compounds)

Or

Determination of structure of organic compound from given NMR spectra.

Ethanol, Ethyl acetate, Benzyl alcohol, Propanoic acid, Butaraldehyde, Ethyl benzoate, Isopropyl benzene, Propyl ether, n-pentane, Propene, Diethyl amine, 2-chloro butane.

NB: All preparations should be carried out by considering green Chemistry approach

1. Preparation of derivative should be carried out on small scale. The starting compound should not be given more than one gram.

2. Calculation of percentage practical yield in preparation is must.

3. Recrystallization of crude product and its melting point.

4. The product should be confirmed byTLC.

5. Assign reactions with mechanism.

Reference books:

1. Practical Organic Chemistry by – A.I.Vogel.

2. Practical Organic Chemistry by – O. P.Agarwal

PHYSICAL CHEMISTRY

I. Non instrumental Experiments:

A. Any one of the following

i) Partition Law.

To determine the partition coefficient of CH_3COOH between H_2O and CCl_4.

ii) Viscosity.

To determine the viscosity average molecular weight of a polymer.

iii) Adsorption.

To investigate the adsorption of oxalic acid by activated charcoal and test the validity of Freundlich & Langmuir isotherms.

iv) Solubility.

To study the effect of addition of electrolyte (NaCl or KCl) on the solubility of Benzoic acid at room temperature.

B. Chemical kinetics. (Any four)

1. The study of energy of activation of first order reaction i.e. hydrolysis of methyl acetate in presence of 0.5 N HCl / 0.5 N H_2SO_4.

2. The study of energy of activation of second order reaction i.e. reaction between $K_2S_2O_8$ and KI (Equal concentrations).

3. The study of energy of activation of second order reaction i.e. reaction between $K_2S_2O_8$ and KI (Unequal concentrations).

4. To study the hydrolysis of methyl acetate by using its two concentrations in presence of 0.5 N HCl and hence find velocity constant of the reaction.

5. To study the effect of addition of electrolyte (KCl) on the reaction between $K_2S_2O_8$ and KI (Equal concentrations).

C. Partial molar volume.

1. To determine the partial molar volume of ethyl alcohol in a mixture of ethyl alcohol and water (Any seven mixtures be given).

II. Instrumental experiments

A. Potentiometry (Any four)

1. Titration of strong acid with strong alkali.

   N.B. i) 8 to 10 ml of 1N acid solution to be given by examiner in 100 ml volumetric flask & student should dilute it to 100 ml and 10ml of this solution is taken for titration.

   ii) Experiment is carried out by taking pilot run from 1 to 10 ml and then final run taking 0.2 ml reading in the range of end point.

2. Preparation of buffer solution and determination of their pH (Any five buffer solutions), Theoretical calculation of pH values by using Henderson's equation.

3. Determination of standard electrode potential of Zn/Zn^{++}, Cu/Cu^{++}, Ag/Ag^+ (Any two).

4. Estimate the amount of Cl^-, Br^- and I^- in given unknown halide mixture by titrating it against standard $AgNO_3$ solution.

5. Titration of ferrous ammonium sulphate using $K_2Cr_2O_7$ solution and to calculate redox potential of Fe^{++}, Fe^{+++} system.

B. Conductometry (Any three).

N.B. i) 8 to 10 ml of 1N acid solution to be given by examiner in 100 ml volumetric flask & student should dilute it to 100 ml and 10ml of this solution is taken for titration.

1. Titration of a mixture of weak acid and strong acid with strong alkali

2. To study the effect of substituent on dissociation constant of weak acid with respect to acetic acid and monochloroacetic acid (cell constant to be given).

   N.B. Calculate K by using formula $K = \alpha^2 . C / 1 - \alpha$

3. To determine the velocity constant of hydrolysis of ethyl acetate by NaOH solution by conduct metric method.

4. To determine the normality of citric acid in lemon by titrating it against standard 0.2 N NaOH solution by conduct metric method.

5. To determine λ_∞ of strong electrolyte (NaCl or KCl) and to verify Onsager equation.

C. Refractometry. (Any One)

1. To determine the percentage composition of unknown mixture by (i) graphical method and (ii) by composition law (Densities of pure liquids A & B be given).

2. To determine the molar refractivity of methyl acetate, ethyl acetate, n-hexane and

carbon tetrachloride and calculate the refraction equivalents of C, H and Cl atoms.

D. Colorimetry (Any Two).

1. To verify Lambert – Beer's law using $CuSO_4$ solution.

2. To estimate of Fe^{+++} ions by thiocynate method.

3. To estimate Fe^{+++} ions using salicylic acid by colorimetric titration.

4. To determine the order of reaction for the oxidation of alcohol by potassium dichromate and potassium permanganate in acidic medium colorimetrically.

E. pH – metry (Any One).

1. To determine the dissociation constant of monobasic acid (Acetic acid).

2. To determine the dissociation constant of dibasic acid (Malonic acid).

3. To determine hydrolysis constant of aniline hydrochloride.

Reference Books:

1. Findlay's Practical Physical Chemistry (Longman)

2. Advanced Practical Physical Chemistry by J. B. Yadav, Goel publishing house.

3. Practical Physical Chemistry by B. D. Khosla, V. C. Garg (R. Chand and Co.)

4. Systematic experimental Physical Chemistry by Rajbhoj, Chandekar (Anjali Publicaiton) Aurangabad.

5. Practical Physical Chemistry: Nandkumari, Kothari and Lavande.

6. Practical Physical Chemistry by Gurtu (S. Chand).

7. Text Book of Qualitative Inorganic Analysis by A. I. Vogel (ELBS Longman).

Nature of Practical Examination

1) The practical examination will be of **200** marks.

2) The duration of practical examination will be of **three days - six and half hour per day.**

3) Questions related to the practical exercise/project report/industrial visit carried out by the student should be asked in viva.

4) Use of scientific calculator is allowed.

5) S.I. units should be used wherever possible.

6) Use of Chart / Hand book / Text book of practical is allowed.

7) A student is expected to submit a journal certified by the Head of the Department.

8) A student not be permitted to appear at the practical examination unless he/she produces a certified journal. If the journal is lost, the student should produce a certificate from the Head   of   the Department stating that he/she has satisfactory completed the practical work but his /   her   journal is lost.

9) Use of Digital / Analytical / Chainometric / Single pan balance is allowed.

10) A student should submit one copy of project at the time of examination.

Each examiner should asses the project work for Five marks and sign the same. If any student will not submit project work, he/she will be given Zero mark for the project.

11) The distribution of marks for practical examination will be as follows:

A) Physical Chemistry 60 marks

    i) Non-instrumental experiment 25 marks

    ii) Instrumental experiment 25 marks

    iii) Viva 05 marks

    iv) Journal 05 marks

B) Inorganic Chemistry 65 marks

    i) Gravimetric analysis 25 marks

    ii) Preparation 15 marks

    iii) Volumetric estimation 15 marks

    iv) Viva 05 marks

    v) Journal 05 marks

C) Organic Chemistry 60 marks

    i) Mixture separation and identification of compounds 25 marks

    ii) Estimation/Preparation 20 marks

    iii) Derivative 05 marks

    iv) Viva 05 marks

    v) Journal 05 marks

    D) Project 15 marks

Total:- 200 marks

B.Sc. Programme structure (CBCS Pattern)

B.Sc. I, B. Sc. II, B. Sc. III Inorganic, Organic, Physical Analytical Chemistry

/ Industrial Chemistry)

B. Sc. I

Semester	Subject	Course Code	Paper No
I	Inorganic Chemistry	DSC-3A	I
	Organic Chemistry	DSC- 4A	II
II	Physical Chemistry	DSC- 3B	III
	Analytical Chemistry	DSC – 4B	IV

B. Sc. II

Semester	Subject	Course Code	Paper No
III	Physical Chemistry	DSC-C3	V
	Industrial Chemistry	DSC- C4	VI
IV	Inorganic Chemistry	DSC- D3	VII
	Organic Chemistry	DSC – D4	VIII

B. Sc III

Semester	Subject	Course Code	Paper No
V	Inorganic Chemistry	DSC-E5	IX
	Organic Chemistry	DSC- E6	X
	Physical Chemistry	DSC- E7	XI
	Analytical Chemistry	DSC – E8	XII
VI	Inorganic Chemistry	DSC-F5	XIII
	Organic Chemistry	DSC- F6	XIV
	Physical Chemistry	DSC- F7	XV
	Industrial Chemistry	DSC – F8	XVI

SHIVAJI UNIVERSITY, KOLHAPUR.

Accredited By NAAC with 'A' Grade

Revised Syllabus For

B.Sc Part- III

English (Compulsory)

Syllabus to be implemented from

June, 2020 onwards.

Shivaji University, Kolhapur

Compulsory English
Ability Enhancement Compulsory Course (CBCS)
ENGLISH FOR COMMUNICATION
From June 2020 Onwards

Course Objectives:
- ➢ To enhance students' communication skills
- ➢ To impart employability skills to students
- ➢ To prepare students for competitive examinations
- ➢ To enable students to acquire professional skills such as media writing
- ➢ To enable students to learn manners and etiquettes required at workplace
- ➢ To enhance students' reading comprehension skills
- ➢ To create interest in English literature among students
- ➢ To inculcate human values and ethics in order to enable them to become good citizens of the country

Course Outcomes: After the completion of the course, the students will be able to:
- ➢ Communicate in English, in oral and written modes, in their day-to-day lives as well as at workplaces.
- ➢ Face job interviews confidently and efficiently.
- ➢ Acquire soft skills required at workplaces and in real life.
- ➢ Learn group behavior and team work.
- ➢ Learn to value and respect others' opinions and views and develop democratic attitude.
- ➢ Face competitive examinations confidently and efficiently with adequate linguistic confidence.
- ➢ Acquire professional skills required in media writing such as writing editorials.
- ➢ Learn to appreciate and enjoy reading poetry and prose passages.
- ➢ Acquire human values and develop cultured outlook.

SEMESTER V   AECC C

MODULE I
    A. Interview Skills
    B. Enterprise - Nissim Ezekiel
MODULE II
    A. E-Communication
    B. The Ant and the Grasshopper – W.S. Maugham
MODULE III
    A. Englishfor Competitive Examinations
    B. The Look-Out Man - Nicholas Bentley
MODULE IV
    A. Forgetting Our Own History - SudhaMurty
    B.(i) The Butterfly – ArunKolatkar
       (ii) For Your Lanes, My Country --Faiz Ahmed Faiz

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*Note: Semester V: 10 Marks for Internal Evaluation: STUDENTS' SEMINAR

MODULE V
    A. Group Discussion
    B. Evolution - Alexie Sherman Alexie
MODULE VI
    A. Note Making and Note Taking
    B. Gateman's Gift - R. K. Narayan
MODULE VII
    A. Media Writing
    B. Karma - Khushwant Singh
MODULE VII
    A. Bhaurao in America – P. G.Patil
    B. (i) The Grass is Really Like Me- KishwarNaheed
      (ii) To Granny – TejaswiniPatil

==***Note: Semester VI: 10 Marks for Internal Evaluation: STUDENTS' GROUP PROJECT**==

Division of Teaching Hours 8 Modules x 15 Hours = 120 Hours

Shivaji University, Kolhapur
B. Sc. III   Compulsory English
Ability Enhancement Compulsory Course (CBCS)
ENGLISH FOR COMMUNICATION
PATTERN OF QUESTION PAPER   (June 2020 Onwards)

Semester V (Paper C)   **Total Marks: 40**

Q. No	Sub Q.	Type of Question	Based on	Marks
Q.1	A.	Four multiple choice questions with four alternatives to be set	Prose and Poetry	03
	B.	Answer in one word/phrase/sentence each.	Prose and Poetry	03
	C.	Two different **Vocabulary Exercises** to be set for 1 mark each	Prose and Poetry	02
Q.2	A.	Answer the following questions in 3-4 sentences each. (2 out of 3)	2 on Prose and 1 on Poetry	04
	B.	Write **Short Note** on the following in about 7-8 sentences each. (1 out of 2)	1 on Prose and 1 on Poetry	04
Q.3	--	Question to be set on **Interview Skills (A or B)**	Module I A	08
Q.4	--	Question to be set on **E-Communication(A or B)**	Module II A	08
Q.5	--	Question to set on **English for Competitive Examinations (A or B)**	Module III A	08

Semester VI (Paper D)   **Total Marks: 40**

Q. No	Sub Q.	Type of Question	Based on	Marks
Q.1	A.	Four multiple choice questions with four alternatives to be set	Prose and Poetry	03
	B.	Answer in one word/phrase/sentence each.	Prose and Poetry	03
	C.	Two different **Vocabulary Exercises** to be set for 1 mark each.	Prose and Poetry	02
Q.2	A.	Answer the following questions in 3-4 sentences each. (2 out of 3)	2 on Prose and 1 on Poetry	04
	B.	Write **Short Note** on the following in about 7-8 sentences each. (1 out of 2)	1 on Prose and 1 on Poetry	04
Q.3	--	Question to be set on **Group Discussion(A or B)**	Module V A	08
Q.4	--	Question to be set on **Note Making and Note Taking(A or B)**	Module VI A	08
Q.5	--	Question to set on **Media Writing(A or B)**	Module VII A	08

SHIVAJI UNIVERSITY, KOLHAPUR.

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Accredited By NAAC with 'A' Grade
CHOICE BASED CREDIT SYSTEM

Syllabus For

B.Sc. Part - II

Environment Science (Entire)

SEMESTER III AND IV

(Syllabus to be implemented from June, 2020 onwards)

B.Sc. Part - II

Environment Science (Entire)

SEMESTER III AND IV

(Syllabus to be implemented from June, 2020 onwards.)

❖ Guidelines shall be as per B. Sc. Regular Programme

❖ Rules and Regulations shall be as per B.Sc. Regular Programme except CBCS R.B.Sc.3 Structure of Programme and List of Courses.

❖ Preamble :

This syllabus is framed to give sound knowledge with understanding of Environment science to undergraduate students of

B.Sc. Environment Science (Entire) Programme. Students will learn Environment Science as a separate course (subject) from B. Sc. I.

The goal of the syllabus is to make the study of Environment Science popular, interesting and encouraging students for higher studies including research.

Structure of B. Sc. Environment Science (Entire) Programme Sem III & IV
Structure – II

Sr. No.	Course (Subject) Title	THEORY Credits	THEORY No. of lectures	THEORY Hours	PRACTICAL Credits	PRACTICAL No. of lectures	PRACTICAL Hours	THEORY Hours	THEORY Max	THEORY Total Marks	THEORY Min	PRACTICAL Hours	PRACTICAL Max	PRACTICAL Min
SEMESTER – III (Duration – 6 Months)		TEACHING SCHEME						EXAMINATION SCHEME						
1	DSC-C1	2	3	2.4	4	8	6.4	2	50	100	35			
2	DSC-C2	2	3	2.4				2	50					
3	DSC-C3	2	3	2.4	4	8	6.4	2	50	100	35	PRACTICAL EXAMINATION IS ANNUAL		
4	DSC-C4	2	3	2.4				2	50					
5	DSC-C5	2	3	2.4	4	8	6.4	2	50	100	35			
6	DSC-C6	2	3	2.4				2	50					
7	AECC-C	4	4	3.2	---	---	---			---	---			
	TOTAL	**16**	**22**	**17.6**	**12**	**24**	**19.2**			**300**	---			
SEMESTER – IV (Duration – 6 Months)														
1	DSC-D1	2	3	2.4	4	8	6.4	2	50	100	35	As per BOS Guide-lines	100	35
2	DSC-D2	2	3	2.4				2	50					
3	DSC-D3	2	3	2.4	4	8	6.4	2	50	100	35		100	35
4	DSC-D4	2	3	2.4				2	50					
5	DSC-D5	2	3	2.4	4	8	6.4	2	50	100	35		100	35
6	DSC-D6	2	3	2.4				2	50					
7	AECC- C AECC- D	---	---	---	---	---	---	3	70 / 30	100	25 / 10	---	---	---
	TOTAL	**12**	**18**	**14.4**	**12**	**24**	**19.2**			**400**	---			
		28	**40**	**32**	**24**	**48**	**38.4**			**700**	--	---	**300**	

- Student contact hours per week : 32 Hours (Min.)
- Total Marks for B.Sc.-II (Including EVS): **1000**
- Theory and Practical Lectures : 48 Minutes Each
- Total Credits for B.Sc.-II (Semester III & IV) : **52**
- **DSC : -** Discipline Specific Core Course : All papers are compulsory.
- **AECC**- Ability Enhancement Compulsory Course (C) :
  Environmental Studies: EVS (Theory – 70 & Project – 30 Marks)
- Practical Examination will be conducted annually for100 Marks per course (subject).
- *There shall be separate passing for theory and practical courses also for Environmental Studies.*

CBCS B.Sc. Environment Science: Part 2 (Sem III & IV)

Course code	Name of Course	Course code	Name of Course
Sem III		**Sem IV**	
DSC-C1	Disaster Management-1 (Natural)	**DSC-D1**	Environmental Microbiology
DSC-C2	Biostatistics	**DSC-D2**	Environmental Management System &Audit
DSC-C3	Environmental Ethics and Environmental Issues	**DSC-D3**	Environmental Engineering - 2[waste water]
DSC-C4	Environmental Engineering - 1[water]	**DSC-D4**	Environmental Education & Policy
DSC-C5	Environmental Impact Assessment	**DSC-D5**	Environmental Economics
DSC-C6	Environmental Biotechnology	**DSC-D6**	Disaster Management–II (Man made)
AECC – C	Environmental Studies (Theory)	**AECC – D**	Environmental Studies (Project)

AECC-C: - Ability Enhancement Compulsory Course: Environmental Studies
Practical

DSC-P5	Lab Course V (Based on DSC-C1, DSC-C2, DSC-C3, DSC-C4)	DSC-P7	Lab Course VII (Based on DSC-D3, DSC-D4, DSC-D5, DSC-D6)
DSC -P6	Lab Course VI (Based on DSC-C5, DSC-C6, DSC-D1, DSC-D2)		

Semester III
Disaster Management I (Natural) – Paper I
(DSC-C1 – Disaster Management-1 (Natural))
Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48 minutes

Course Outcome:
1. Understand the concepts, effects and mitigation measures of natural disasters.
2. Get acqainted with assessment of hazards and legal aspects.

Unit	Lecture Hours
Unit I	**15**
A: Introduction to natural disasters: Definition and types of natural disasters, concept and conditions of hazards, vunerability, risk Guidelines for hazard assessment and vunerability analysis, Assessment in sudden onset emergencies, assessment in slow onset emergencies Disaster vulnerability in India and future trends	**8**
B: Flood, Drought, Tsunami, Earthquakes Flood: Flood risk mapping, flood plain management, watershed management, climate variability and change, flood forecasting, flood mitigation Droughts: Defintion, causes and types of drought, effects and mitigation of droughts, case studies Tsunami: History and causes of Tsunami, effects of Tsunami, warning and monitoring of Tsunami, mitigation of Tsunami	**7**
Unit II	**15**
A: Tornadoes, Hurricanes, Earthquakes Types of hurricanes, Katrina and Rita hurricanes, Effects of winds on buildings, Debris management planning Introduction to tornado, formation of tornado, monitoring and predicting tornadoes, types of tornadoes and mitigation measures Earthquakes: warning and effects of earthquakes, preventive measures of earthquakes	**8**
B: Natural disaster mitigation and legal aspects Community health and awareness, safety and preparedness for emergencies, Practical and sustainable approaches to disaster recovery National Calamity Management Act, State Disaster Management Act Natural disaster management in national development Disaster management in India Disaster Management ethics	**7**

SUGGESTED BOOKS:
1. Talwar A. K. and Juneja Satish (2009). Natural Disaster Management, Commonwealth Publication, New Delhi
2. Kapur Anu, Neeti, Meeta, Deeptima, Roshani, Debanjali., Disasters in India, Rawat Publications, New Delhi
3. Brenda D. Philips (2016). Disaster recovery. CRC press, London.
4. Arvind Kumar (2006). Disaster Management, Amol publications, New Delhi.
5. Prabhas C. Sinha (2006) Disaster Relief, SBS Publishers & Distributers PVT. Ltd., New Delhi.

6. Gupta Manisha (2018), Disaster Management, DND Publications, Jaipur

7. Gaur R.C. (2018), Environmental Engineering and Disaster Management, New Age International Publishers, Delhi

Biostatistics – Paper II
(DSC-C2 – Biostatistics)
Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48 minutes

Course Outcome:
1. Understanding use of statistical methods for environmental studies.
2. Understanding methods of collection and analysis of data.

Unit	Lecture Hours
Unit I	**15**
A: Introduction to statistics: Definition and functions of statistics, origin of statistics, statistical methods, charachteristics of statistical data, importance of statistics in biological and physical sciences, limitations of statistics, Tpes of data, methods of collecting data: primary and secondary data, classification and organization of data Vital statistics: Introduction, measures of mortality, standard death rate, measures of fertility, life tables	**7**
B: Diagramatic representation and measures of central tendency Bar graph, histogram, frequency polygon, pie chart, Ogive curve Introduction to measures of central tendency, Arithmetic mean, weighted arithmetic mean, geometric mean, harmonic mean, mode, median: introduction, merits and demerits, relation between mean, mode and median	**8**
Unit II	**15**
A: Measures of dispersion: Introduction and characteristics of good measure of dispersion, absolute and relative measures, Mean deviation and coefficient of mean deviation, mean deviation in continuous and discrete series, merits and demerits Range and co-efficient of range Quartile deviation and co-efficient of quartile deviation Standard deviation: standard deviation for discrete and continuous series, merits and demerits Variance, coefficient of variation	**7**
B: Sampling, Coerrelation and regression Introduction to sampling, steps involved in sampling, types and methods of sampling Correlation and regression: relation between variables, linear regression analysis, regression analysis of grouped data, correlation analysis, Karl Pearson's coefficient of correlation	**8**

SUGGESTED BOOKS:

1. Gupta C. B., Gupta Vijay (2010) An Introduction to Statistical Methods, Asian Books Pvt. Ltd., New Delhi
2. Bhowal M. K., Barua Pronob (2006) Statistics. Daya Publishing House, New Delhi.
3. Gupta S. P. (2005), Statistical Methods, Sultan Chand and Sons Publishers, New Delhi

4. Gaur A.S., Gaur S.S. (2006), Statistical Methods for Practice and Research, Sage Publication, New Delhi
5. Medhi J. (2006), Statistical Methods, New Age International Publishers, New Delhi
6. Rastogi V. B., (2009) Fundamental of Biostatistics, Ane Books Pvt. Ltd., New Delhi

Environmental Ethics and Environmental Issues – Paper III
(DSC-C3 – Environmental Ethics and Environmental Issues)
Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48 minutes

Course Outcome:
1. Understand the causes and effects of various environmental issues.
2. Get aquainted with environmental ethics from Indian perspective.

Unit	Lecture Hours
Unit I	**15**
A: Introduction to environmental issues: Environmental problems i.e. indoor and workplace: water and sanitation, overcrowding, accident, garbage, disease vectors, hazardous waste Global environmental issues with case studies Development and environmental issues in India	**8**
B: Urbanization and environmental issues Demographic profile, Polpulation density, Impact of urbanization on environment Denundation of rural population and urbanisation and environmental protection Role of NGOs in tackling environmental issues, cities and ecological sustainability, city problems within global perspective	**7**
Unit II	**15**
A: Environmental ethics Introduction to environmental ethics, concept and history of environmental ethics, relation between environment and people, spitituality and environmental ethics, population and environmental ethics Challenges to the world environmental ethics Human nature interaction in third world country	**8**
B: Environmental ethics from Indian perspectives: Significance of Indian traditions for environmental ethics, Women in forest, Indian heritage of conservation ethics, environment protection in Indian culture: cultural evolution, nature worship, tribal tradition, reservation of forest, movements for environmental protection Population control in the light of environmental protection	**7**

SUGGESTED BOOKS:

1. Sayeed Unisa (2016), Population, health and environment, Rawat publicatons, Jaipur.
2. S.C.Naik (2005), Society and Environment,Oxford & IBH Publishing Co.Pvt.Ltd.,New Delhi.
3. Prakash Chand Kandpal (2018), Environmental Governance in India, Sage Publications, London.
4. Dr. M.N.Madhyastha (2003), Prospects and problems of Environment,Daya Publishing house, Delhi.

5. G. Tyler Miller,Jr. (2007), People and Environment, Cengage learning India Ptd. Ltd., New Delhi.
6. George A. James(1999), Ethical Perspectives on Environmental issues in India,A.P.H. Publishing corporation, New Delhi.
7. Diana Mitlin David Satterthwaite Environmental problems in third world cities, Earthscan publications Ltd., London.

Environmental Engineering-1 (Water) – Paper IV
(DSC-C4 – Environmental Engineering-I (Water))
Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48 minutes

Course Outcome:
1. Understand the demand of water for various purposes.
2. Understand various steps involved in water treatment.

Unit	Lecture Hours
Unit I	**15**
A: Introduction to Environmental Engineering Introduction to environmental engineering, rate of demand, factors affecting rate of demand: domestic, civic, industrial, business, loss etc, Population forecasting and methods of population forecasting Surface runoff, precipitation, measurement of rainfall, points to be considered for selecting rain guage	**8**
B: Sedimentation and Coagulation Theory of sedimentation, types of sedimentation tanks, design aspects of continuous sedimentation tanks Coagulation of water, principles of coagulation, usual coagulants, feeding of coagulants: dry feeding and wet feeding,	**7**
Unit II	**15**
A: Filtration and Disinfection Introduction to filtration, theory of filtration, classification of filters i.e. slow sand filters and rapid sand filters, essential parts of filter, pressure filters, advantages and disadvantages of pressure filters Disinfection: introduction to disinfection, methods of disinfection, Chlorination, properties of chlorine, applications of chlorine	**7**
B: Other Methods of Water Treatment: Flow diagram of general water treatment plant Colour, odour and taste removal: aeration, treatment by activated carbon, use of copper sulphate Iron and manganese removal, fluoridation	**8**

SUGGESTED BOOKS:

1. Mathur Shruti, Kumar Rajendra (2017), Water on earth, Rawat Publication, New Delhi
2. Rangwala S.C., Rangwala K.S. (2004, Water supply and sanitary engineering, Charotar Publising House, Anand
3. Basak N.N. (2012), Environmental Engineeing, Tata McGraw Hill Education Private Limited, New Delhi
4. Rao M.N., Datta A.K. (2018), Waste water treatment, CBS Publishers and Distributors Pvt Ltd, New Delhi

5. Mark J. Hammer (2015), Water and wastewater, Pearson Publication, Noida

6. Mackenzie L. Davis, David A. Cornwell (2014), Introduction to environmental engineering, New York
7. R. Parker, N. Morris, F.N. Fair, S.C.Bhatia (2008), Waste water engineering, CBS Publishers and Distributors, New Delhi
8. Patra K. C. (2002), Hydrology and water resources engineering , Narosa publishing house, New Delhi
9. Metcalf and Eddy (2003), Waste water engineering treatment and reuse, Tata McGraw Hill, New Delhi

Environmental Impact Assessment– Paper V
(DSC-C5 – Environmental Impact Assessment)
Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48 minutes

Course Outcome:
1. Understand the need and objectives of EIA.
2. Understand the impacts of various developmental activities on environment.

Unit	Lecture Hours
Unit I	**15**
A: Introduction to EIA Definition, concept, objectives and scope of EIA, Elements and components of EIA, Baseline studies in EIA: pre and post monitoring EIA in developed and developing countries, Public participation in EIA Uncertanities in EIA, EIA protocol and Term of Reference, EIA and legal aspects	**7**
B: Methodologies and impacts of EIA Impacts of EIA: negative and positive, tangible and intangible, reversible and irreversible, primary and secondary Methodologies of impact prediction: matrix methodology, network methodologies, checklist methodolies Public participation in EIA, identification of publics, selection of public participation techniques, Public hearing	**8**
Unit II	**15**
C: Prediction of impact on air and water: Identification of types and quantities of air pollutants and their impacts, impact predictions: mass-balance approaches, box model approach, air quality dispersion model, Identification and incorporation of mitigation measures Identification of surface water quality, impact predictions: mass balance approach, aquatic ecosystem modelling approach, mitigation measures	**7**
D: Prediction of impacts on soil, groundwater and socioeconomic environment; Identification of impacts on soil and groundwater, qualitative and quantitative approaches, assessment of impact significance, mitigation of impacts Prediction and identification of socio-economic impacts, education service impacts, traffic and transportation system impacts, Human health impacts EIA report writing	**8**

SUGGESTED BOOKS:
1. Canter L.W. (1996) Environmental Impact Assessment, McGraw-Hill, Inc., New Delhi.

2. A.K. Shrivastava (2017) Environmental Impact Assessment, A P H Publishing Corporation, New Delhi.
3. R.R. Barthwal (2012) Environmental Impact Assessment, New age international Publishers, New Delhi.
4. G. Madan Mohan (2008) Environmental and Sustainable Development, omega Publication, New Delhi.
5. M. Anji Reddy (2019) Environmental Impact Assessment theory and Practice, BS Publication, Hydrabad.
6. R.R. Barthwal (2002) Environmental Impact Assessment, New age International publishers, New Delhi.

Semester III
Environmental Biotechnology– Paper VI
(DSC-C6– Environmental Biotechnology)
Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48 minutes

Course Outcome:
1. Understand the need and importance of biofuels, biopesticides and vermicomposting.
2. Inculcation of biotechnology approaches to solve environmental problems.

Unit	Lecture Hours
Unit I	**15**
A: Introduction to environmental biotechnology: Introduction to environmental biotechnology, scope and objectives of environmental biotechnology, Vermicomposting: introduction, composting process, factors affecting composting, charachteristics of vemicompost and benefits Biofuels: Hazards due to fossil fuels, biofuels as alternative to fossil fuels, ethanol, biodiesel, biogas	**7**
B: Biopesticides and biotechnology in forestry Biopesticides: introduction and approaches of biological control of pest, various bacterial insecticides, advantages and disadvantages of microbial insecticides, Use of pheromones for pest management, Biological control of weeds Biotechnology in forestry and wasteland development: tree improvement through biotechnolohy, tissue culture techniques	**8**
Unit II	**15**
A: Biotechnology in combating environmental pollution Air pollution and its control through biotechnology, methods of biofiltration Xenotiotics in environment, oxic and anoxic degration of xenobiotics, Biotechnological approach to address environmental problems	**7**
B: Genetically Modified Organisms and IPR: Genetically Modified Organisms in environment, effects of GMO's on environment, effects on human health, biosafety management Environmental biotechnology and Intellectual Property Rights Genetic engineering, concept of bio-safety, role of biotechnology in conservation of species	**8**

SUGGESTED BOOKS:
1. Sohal H.S (1994), Environment and biothechnology, Ashish Publishing house, New Delhi.
2. T. Srinivas (2008), Environmental Biotechnology, New age International Publishers, New Delhi.
3. H.K. Das (2017), Textbook of Biotechnology, Wiley Publications, New Delhi.
4. Scragg Alan (2011), Environmental Biotechnology, Oxford University Press, New York

5. Buddola Viswanath, Environmental Biotechnology, Narosa publication house, New Delhi.
6. Colin R., Kristiansen B.(2001),Basic Biotechnology,Cambridge University press, UK.
7. Bhattacharyya B. C., (2010), Environmental biotechnology, Oxford university press, New Delhi.
8. Jha Ashwini (2017), Environmental Biotechnology Principles and applications, Anmol Publication Pvt. Ltd., New Delhi.
9. A.K. Chatterji, (2011), Introduction to Environmental Biotechnology, PHI Private Ltd. , New Delhi.

Semester IV
Environmental Microbiology– Paper I
(DSC-D1 – Environmental Microbiology)
Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48 minutes

Course Outcome:
1. Understand the basic concepts and scope of environmental microbiology.
2. Study the mechanism of various waterborne and airborne diseases.

Unit	Lecture Hours
Unit I	**15**
A: Introduction to Microbiology Definition, Scope and history of Microbiology Types of Microbiology: Medical, Agricultural, Industrial, Food Microbiology Preservation and Maintanance of Microbial culture, Terms used in Microbiology: Uni cellular and Multi cellular organisms, Algae, Fungi, Protozoa, Viruses, Bacteria Environmental microbiology, interrelations with other fields of microbiology and applications	**7**
B: Water Microbiology Introduction, Human disases associated with water and their classification, Microbial agents associated with water borne dieases, Prevention and control of water borne diseases Role of micro- organisms for the treatment of waste water Most probable number	**8**
Unit II	**15**
A: Air Microbiology Introduction to aerial microbiology, Transport and deposition of micro-organisms in air, Types of air borne microbial diseases and their causal agents, Mode of transmission, Allergic disorders by air micro-flora, Indoor and out door air microbiology, Air sanitation: Ventilation, safety cabinets, disinfectans, sprays, Electro static precipitation, Bio-aerosol control in laboratory	**8**
B: Soil Microbiology Introduction to soil microbiology: Micro flora of soil, their functions and factors affecting their population: Bacteria, actinomycetes, Fungi, Algae, Protozoa, Viruses. Methods of studying Ecology of Soil microflora: Sample collection, Sample processing, Isolation of culture	**7**

SUGGESTED BOOKS:

1. Mark Coyne (1999), Soil Microbiology, Delmar Thomson lerning, New York.
2. K. Vijaya Ramesh (2004), Environmental microbiology, MJP Publishers, Chennai.

3. I Edward Alcamo (1998), Microbiology, Schaum's outline series, McGRAW- Hill, New Delhi.
4. G. Rangaswami (1993), Agricultural Microbiology, Prentice- Hall of India Ptv. Ltd., New Delhi.
5. P.D. Sharma (2005), Environmental Microbiology, Narosa Publishing House, New Delhi.
6. RG Buckley 2016), Environmental Microbiology, CBS Publishers & Distributors, New Delhi.

3. I Edward Alcamo (1998), Microbiology, Schaum's outline series, McGRAW- Hill, New Delhi.
4. G. Rangaswami (1993), Agricultural Microbiology, Prentice- Hall of India Ptv. Ltd., New Delhi.

Semester IV
Environmental Management System and Audit– Paper II
(DSC-D2 – Environmental Management System and Audit)
Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48 minutes

Course Outcome:
1. Understand the scope, objectives and need of environmental auditing.
2. Understand the importance of Environment Management System.

Unit	Lecture Hours
Unit I	**15**
Introduction to Environmental Auditing: Preamble, scope and objectives of environmental auditing, Applicability of statutory environmental statement audit, Qualities of an environment auditor, Contents of EA reports. Preparation of documents for consent to establish/ consent to operate / Renewal	**8**
Frame and Tools of Environmental Auditing: Principle elements of an environmental audit: External audit and Internal audit, Need of Environmental Audit, Aims of Environmental Auditing. Framework for a comprehensive audit: Identifying the auditors, Consultants, In-house auditing, Combining the external auditor and in-house staff, Community involvements. Tools for Auditing.	**7**
	15
Types and Procedure of Environmental Auditing: Background of auditing strategy, type of audit: Approach A & B, Environmental audit in India: Background of environmental audit, onjectives and advantages of environmental audit, Environmental audit procedure: Pre audit activities, activities at site, Post audit activities.	**8**
Environment Management System: Introduction, definition and need of Environment Management System, Scope, application and benefits of ISO certification, principles of ISO series Requirement of Environment Management System, Deming cycle of continuous improvement	**7**

SUGGESTED BOOKS:

1. Environmental audit by Mhaskar AK
2. Environmental audit by Mhaskar AK
3. Environmental Assessment and Statements by Harr and Hagerty (1977)
4. Environmental Assessment and Statements by Harr and Hagerty (1977)

5. Environmental Auditing by Central Pollution Control Board.
6. Stoner, Freeman, Gilbert – Management – Prentice Hall of India Ltd., New Delhi – VIth Edition
7. Environmental Auditing by Central Pollution Control Board

Semester IV
Environmental Engineering (Waste water) – Paper II
(DSC-D3 – Environmental Engineering (Waste water)
Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48 minutes

Course Outcome:
1. Study the charachteristics and constituents in waste water.
2. Understanding primary, secondary and tertiary treatments to be provided to waste water.

Unit	Lecture Hours
Unit I	**15**
A: Introduction to waste water engineering: Characteristics of waste water, Constituents in waste water: metallic constituents and their sources, effluent discharge limits for metals and other characteristics Domestic and industrial waste water sources, Flow diagram of waste water treatment plant: ETP and STP	**8**
B: Physical treatments to waste water: Screening: types of screens, gravity separation, particle settling theory, grit removal: grit characteristics and types of grit chambers, Aeration, types of aeration systems Removal of VOC by aeration, oil and grease removal Low cost treatments: stabilization ponds, septic tanks, lagoons	**7**
Unit II	**15**
A: Biological treatments to waste water: Objectives of biological treatment, Aerobic biological oxidation, biological nitrification and denitrification, Activated sludge process and recent developments, Trickling filters and types of trickling filters, Bio-digesters, rotating biological contractors	**8**
B: Chemical treatments to waste water: Role of chemical processes in wastewater treatment, Chemical precipitation for phosphorus removal Removal of heavy metals and dissolved inorganic substances Chemical oxidation and its applications Chemical neutralization and stabilization Tertiary treatments: reverse osmosis	**7**

SUGGESTED BOOKS:

1. Mathur Shruti, Kumar Rajendra (2017), Water on earth, Rawat Publication, New Delhi

2. Rangwala S.C., Rangwala K.S. (2004, Water supply and sanitary engineering, Charotar Publising House, Anand
3. Basak N.N. (2012), Environmental Engineeing, Tata McGraw Hill Education Private Limited, New Delhi
4. Rao M.N., Datta A.K. (2018), Waste water treatment, CBS Publishers and Distributors Pvt Ltd, New Delhi

5. Mark J. Hammer (2015), Water and wastewater, Pearson Publication, Noida
6. Mackenzie L. Davis, David A. Cornwell (2014), Introduction to environmental engineering, New York
7. R. Parker, N. Morris, F.N. Fair, S.C.Bhatia (2008), Waste water engineering, CBS Publishers and Distributors, New Delhi
8. Patra K. C. (2002), Hydrology and water resources engineering, Narosa publishing house, New Delhi
9. Metcalf and Eddy (2003), Waste water engineering treatment and reuse, Tata McGraw Hill, New Delhi

Environmental Education and Policy – Paper IV
(DSC-D4 – Environmental Education and Policy)
Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48 minutes

Course Outcome:
1. Study the backround, need, objectives and status of environmental education.
2. Get aqauinted with various environmental laws in India.

Unit	Lecture Hours
Unit I	**15**
A: Introduction to Environmental Education Definition and background of environmental education, need and objectives of environmental education. Status of environmental education in new education policy – Role of various institutions in protection of environment (Govt. and Non Govt.)	**8**
B: Introduction to Environmental law: Introduction to environmental law, need for environmental law in India, magna carta on human environment, our common future Indian constitution and 42nd amendment of 1976, right to constitutional remedies and environment, fundamental duties of citizens for environment, Polluter pays principle, corporate social responsibility	**7**
Unit II	**15**
A: Environmental laws The environment (Protection) Act, 1986. The water (prevention and control of pollution) act, 1974 The air (prevention and control of pollution) act, 1981 Public Liability Insurance Act, 1991. Noise Pollution and Law, Sec. 119 and 120 of the Motor Vehicles Act,1989 and rules framed there under.	**8**
B: Environmental Pollution and Control under other laws: Provisions of Indian Penal Code, 1860 Provisions under Criminal Procedure Code, 1973 National Environment Tribunal Act, 1995 Coastal Regulation Zone, 2011: objectives and physical limits of zone National Environmental Policy, 2006: objectives, principles and strategies	**7**

SUGGESTED BOOKS:

1. Bell stuart, MCGillivray, Environmental law, Oxford University Press, New Delhi
2. Singh Gurdeep (2005) Environmental law in India, Macmillan India Ltd, Delhi
3. Shastri S.C. (2015), Environmental Law, Eastern Book Company, Lucknow
4. Divan Shyam, Rosencranz (2013), Environmental Law and policy in India, Oxford University Press, New Delhi
5. Venkat Aruna 2011), Environmental Law and Policy, PHI Learning Pvt. Ltd., New Delhi
6. Chatterjee Benimadhab (2003), Environmental Laws, Deep and Deep Publications Pvt. Ltd., New Delhi
7. Dr. S. R. Mynemi (2016), Environmental Law, Asia Law House, Hyderabad
8. Shastri S. C. (2005), Environmental Law, Eastern Book Company, Lucknow

Environmental Economics – Paper V
(DSC-D5– Environmental Economics)
Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48 minutes

Course Outcome:
1. Study the need of economics for environment management.
2. Study the environmental valuation and techniques of biodiversity valuation.

Unit	Lecture Hours
Unit I	**15**
A: Introduction to environmental economics Role of economics in environment, Need of eco-principles, Environmental economics Vs traditional economics, evolution and growth of environmental economics, Training environmental inputs into the economy, environment and economic growth, environment and development.	**8**
B: Environmental valuation and theories Introduction to environmental valuation: meaning and types of environmental values, valuation of intangible benefits of the environment Hardin's thesis of tragedy of the commons, social cost benefit analysis, cost effectiveness analysis	**7**
Unit II	**15**
A: Sustainability of economic development: Concept of sustainable development, Policy approach of sustainable development, role of technology and human values, Management of sustainable development and institutions Techniques of biodiversity valuation: Market based techniques revealed preferences techniques, stated preference techniques.	**8**
B: Economics of environmental policies: Introduction to environmental management policy, need for environmental policy, Instruments for environmental policy, Instruments for environmental policy Principles of commercial forestry economics, Economic incentives for environment regulations.	**7**

SUGGESTED BOOKS:
1. Ashwani Mahajan (2010), Environmental Economics, Centrum Press, New Delhi.
2. Ranbindra N. Bhattacharya (2004), Environmental Economics, Oxford university Press, New Delhi.

3. Janet M. Thomas (2007), Environmental Economics, South- Western Cengage learning, New Delhi.
4. G.S. Nayudu(2008), Environmental Economics, Adhyayan Publishers & Distributers, New Delhi.
5. K. Singh (2007), Environmental Economics, SAGE Publications, New Delhi.
6. Ramprasad Sengupta (2001), Ecology and Economics, Oxford University Press, New Delhi.
7. N. Hanley (1997), Environmental Economics in Theory and Practice, Macmillan Press Ltd., London.
8. S.L. Lodha (1991), Economics Of Environment, RBSA Publishers, Jaipur.
9. Rabindra N. bhattacharya (2001), Environmental Economics, Oxford University Press, New Delhi.

Semester IV
Disaster Management-II (Man made) – Paper VI
(DSC-D6 – Disaster Management (man made))
Credits 2 (Marks 50) Hours 30, 37.5 Lectures of 48 minutes

Course Outcome:
1. Understand causes and mitigation measures of man-made disasters.
2. Understand various measures of disaster preparedness and disaster management in India.

Unit	Lecture Hours
Unit I	**15**
A: Introduction to man made disasters: Concept and types of man-made disasters, Causes effects and management of man-made disasters: fire accident, road, rail and air traffic accident, industrial accidents Case studies: Bhopal gas leakage, Exxon valdez oil spill, Chernobyl nuclear explosion Biological disasters: Epidemics: causes, effects and management, Dengue, HIV & AIDS, Covid 19, Mad cow disease	**7**
B: Understanding the risk of man-made disasters: Introduction to disaster risk, Key considerations for understanding disaster risk for industrial, chemical, nuclear, transport and marine pollution hazards Role of stakeholders in man made disasters Case studies: Protecting denube delta from industrial accidents, nuclear waste mapping in central Asia, Pipeline transport accidents, Baltic marine environment protection commission	**8**
Unit II	**15**
A: Enhancing disaster preparedness: Key considerations for enhancing disaster preparedness for effective response of industrial, nuclear and transport hazards, Mock drill Case studies: Chernobyl recovery and development programme, UNECE convention on transboundary effects of industrial accidents, Regional, transboundary early warning system Role of community in disaster management	**7**
B: Introduction to multihazard approach and Disaster Management in India: Reducing the risk of Natech hazards, Collaboration, engagement and partenership, Transboundary cooperation, Multiple dimensions of disaster risk, GIS and remote sensing, Scientific methodologies for monitoring, Innovation and technology, Communication and training Role of UNDP and NCDM in disaster management National Disaster Policy, 2009	**8**

Disaster Management Act, 2005	

SUGGESTED BOOKS:

1. Kapur Anu, Neeti, Meeta, Deeptima, Roshani, Debanjali., Disasters in India, Rawat Publications, New Delhi
2. Brenda D. Philips (2016). Disaster recovery. CRC press, London.
3. Arvind Kumar (2006). Disaster Management, Amol publications, New Delhi.

4. Prabhas C. Sinha (2006) Disaster Relief, SBS Publishers & Distributers PVT. Ltd., New Delhi.
5. Gupta Manisha (2018), Disaster Management, DND Publications, Jaipur

DSC-P5 LAB COURSE

Sr. No.	Name of Experiment
1	Study of movement of tectonic plates
2	Study of formation of tornadoes
3	Determine various measures of watershed management to avoid flood
4	Study of epicentre for earthquakes and tsunami
5	Study of natural disaster management with local context
6	Study of plotting of graphs and diagrams
7	Determination of measures of central tendency
8	Determination of measures of dispersion
9	Determination of correlation coefficient and regression
10	Preparation of life table
11	Determine fertility, natality and mortality rate of given population
12	Study indoor environmental problems and mitigation measures with local context
13	Determine importance of various plant species in indian traditions
14	Determine importance of various animals in Indian culture
15	Study the cultural evolution in India with respect to environmental ethics
16	Determine optimum dose of Alum required for given water sample
17	Determine residual chlorine from given water sample
18	Determine phosphate from given water sample
19	Determination of turbidity of given water sample
20	Determination of MPN from given water sample
21	Determination of Sulphate from water sample
22	Determination of permanganate value of water
23	Population forecasting for water supply scheme
24	Estimation of water quality index
25	Measurement of rainfall with the help of rainguage

DSC- P6 LAB COURSE

Sr. No.	Name of Experiment
1	Measurement of rainfall with the help of rainguage
2	Prediction of impacts on air quality
3	Prediction of impacts on water quality
4	Study of vermicomposting techniques through field visit
5	Study of biofertilizers through field visit
6	Study of Genetically Modified Organisms used in local area
7	Study of anaerobic digestion of cattle waste
8	Preparation of media for microbial culture
9	Isolation of culture of microbes from water
10	Use of microorganisms as bio-indicators for water/soil pollution monitoring
11	Study of microorganisms by Standard Plate Count method
12	Isolation of bacteria from soil and decaying matter
13	Study of Membrane Filter Technique
14	Study of cultural charachteristics of microorganisms
15	Study of Phosphorus solubilizing bacteria
16	Study of motility of microorganisms
17	Gram staining
18	Preparation of green audit report
19	Preparation of audit check list
20	Study of raising of non-confirmative report through case study

DSC- P7 LAB COURSE

Sr. No.	Name of Experiment
1	To prepare report on various types of local industrial effluents
2	Analysis of pH and electrical conductivity from different types of effluents
3	Visit to Common Effluent Treatment Plant
4	Determination of MLSS and MLVSS
5	Determination of Hexavalent Chromium
6	To study designing of Sewage Treatment Plant
7	Determination of oil and grease from given waste water sample
8	Determination of Sludge Volume Index
9	Study of toposheets for disaster management
10	Study of hazardous chemicals from textile and foundary industry
11	Study of emergency preparedness system at industry
12	Study of material safety data sheet
13	Study of charachteristics of hazards
14	Study of elasticity of demand and and factors affecting demand through market survey
15	Study of diminishing marginal utility
16	Study of economics of pollution control
17	Cost benefit analysis of environmental regulations
18	Relative importance of farm production economics through field visit
19	Study of evaluation of economic environmental benefits
20	Study of techniques of valuation of biodiversity
21	Dtermination of carbonates and bicarbonates from water sample
22	Determination of ammonia from water sample
23	Langelier calcium carbonate saturation index
24	Dtermination pf nitrite from water sample
25	Determination of nitrate from water sample

SHIVAJI UNIVERSITY, KOLHAPUR.

Accredited By NAAC with 'A' Grade

Revised Syllabus For

Bachelor of Science

Part-II
PHYSICS
CBCS PATTERN

Syllabus to be implemented from

June, 2019 onwards.

SHIVAJI UNIVERSITY KOLHAPUR
CBCS Syllabus with effect from June, 2019
B. Sc. Part – II Semester-III
PHYSICS Paper-V
DSC-C1 THERMAL PHYSICS AND STATISTICAL MECHANICS – I
Theory: 36 Hours
Marks-50 (Credits: 02)

Unit I: (18 hrs)
Kinetic Theory of Gases and thermometry

Mean free path, derivation of Maxwell's law of distribution of velocities and its experimental verification, Transport Phenomena: transport of momentum (viscosity), transport of thermal energy (conduction), Transport of mass (diffusion), Law of equipartition of energy (qualitative) and its applications to specific heat of monoatomic and diatomic gases. Principle of thermometry, types of thermometers, Scales of temperature (Celsius, Kelvin, Fahrenheit and Rankine) , Mercury thermometer, Thermoelectric thermometer ,Platinum resistance thermometer , Thermister

Reference books:

1) Heat and Thermodynamics- Brijlal and N.Subramanyam, S.Chand and company LTD
   PP.1-2 ,PP.3 ,PP.3-5, PP.27-30 , PP.21-23,PP.149-152, PP.171-177, PP.177-179, PP.179-181,PP.182-183 ,PP.168-171 .
2) A treatise on Heat- Meghnad Saha and B.N. Srivastava, Indian Press
   PP.104-112, PP.123-126,PP.132-136 ,PP.139-141 ,PP.141-143 ,PP.118 ,PP.120-123 .
3) Fundamentals of heat - D.S.Mathur, S.Chand and Sons publisher
   PP.3-5, PP.3-5, PP.6-10, PP.36-42, (PP.30-35, PP.51
4) Text book of heat - J.B. Rajam, S. Chand and company Ltd
   PP.3-4, PP.4-13, PP.34-38, PP.28-3
5) Heat and Thermodynamics (8th Ed)-M.W. Zemansky and R.Dittman, McGraw Hill.
   PP. 10-12, PP. 21-26, PP.258-260,PP.268-271,PP.271-273 ,PP.273-274 ,PP.274-275 .

Unit II:
Laws of Thermodynamics (18hrs)

Thermodynamic system, thermodynamic variables, equation of state, thermodynamic equilibrium, Zeroth Law of thermodynamics, Internal energy, First law of thermodynamics, conversion of heat into work, specific heats C_P & C_V, Applications of First Law (Isothermal process, Adiabatic process, Isochoric, Isobaric), relation between C_P & C_V, work done during isothermal and adiabatic processes, reversible & irreversible processes, Second law of thermodynamics, Carnot's ideal heat engine, Carnot's cycle (Working, efficiency), Carnot's theorem, Entropy (concept & significance), Entropy changes in reversible & irreversible processes, Third law of thermodynamics, Unattainability of absolute zero.

Reference books:

1)Heat and Thermodynamics- Brijlal and N.Subramanyam, S.Chand and company LTD

PP.215-219 ,PP.216,PP.221,PP.220,PP.227-230 ,PP.244-446 PP.235-237 , PP.225-228, PP.246-247, PP.248-251,PP.256-257,(PP.248, PP.291-292 ,PP.292-293 ,PP.294-295,PP.293

2) Text book of heat- J.B. Rajam ,S.Chand and company Ltd

PP.477-485.

3) Heat and Thermodynamics (8th Ed)-M.W. Zemansky and R.Dittman, McGraw Hill

PP.28-31 ,PP.72, PP.73-77 ,PP.66-70 ,PP.133-135 ,PP.159-164 ,PP.165-166 , PP.179-181 ,PP.187-191,PP.448-451.

4) Heat Thermodynamics and Statistical physics- J.P. Agrawal and Satya Prakash, Pragati Prakashan

PP.1-5 ,PP.6-8 ,PP.11-12 ,PP.17-19 ,PP.82-83 ,PP.23-25 ,PP.99-101 ,PP.81-82,84-89 , PP.102-104 ,PP.121-127 ,PP.123-125 ,PP.129-132.

- **Reference books details:**

1) Heat and Thermodynamics- Brijlal and N.Subramanyam, S.Chand and Company Ltd.

2) Text book of heat- J.B. Rajam, S.Chand and company Ltd

3) A treatise on Heat- Meghnad Saha and B.N. Srivastava, Indian Press

4) Heat and Thermodynamics (8th Ed), M.W. Zemansky and R. Dittman, McGraw Hill

5) Heat Thermodynamics and Statistical physics- J.P. Agrawal and Satya Prakash, Pragati Prakashan

6) Fundamentals of heat - D.S.Mathur, S.Chand and Sons publisher

SHIVAJI UNIVERSITY KOLHAPURSHIVAJI UNIVERSITY KOLHAPUR
CBCS Syllabus with effect from June, 2019
B. Sc. Part –II Semester III
PHYSICS Paper VI
DSC-C2: WAVES AND OPTICS - I
Theory: 36 Hours
Marks -50 (Credits: 02)

Unit I (18 hrs)

1) Superposition of Harmonic Oscillations (7 hrs)
Linearity and superposition principle, Superposition of two collinear harmonic oscillations- for oscillations having equal frequencies (Analytical and geometrical methods) and oscillations having different frequencies (Beats),Superposition of two perpendicular harmonic oscillations- for oscillations having equal frequencies (Graphical and analytical methods) and oscillations having different frequencies (Lissajous figures), Uses of Lissajous figures.

Reference books:
1) The Physics of Waves and Oscillations- N. K. Bajaj, Tata McGraw-Hill Pvt. Ltd., New Delhi, Reprint 2010
   (Chapter 2, pp. 54)
2) Elements of properties of matter-D. S. Mathur, S. Chand & company Pvt. Ltd., New Delhi, Reprint 2016
    (Chapter 4, pp. 110)
3) Physics for degree students- C. L. Arora and Dr. P. S. Hemne, S Chand & Company Pvt. Ltd., Second revised Edition, reprint 2014, Ram Nagar, New Delhi
    (chapter 14, pp. 557-570)
4) A textbook of sound – N SubrahmanyamBrijlal, Vikas Publishing House Pvt. Ltd., New Delhi,
   (Chapter 1, pp. 17, Chapter 2, pp 29)

2) Coupled Oscillations: (4 hrs)
Frequencies of coupled oscillatory systems, normal modes and normal co-ordinates, energy of coupled oscillations, energy transfer in coupled oscillatory system.

Reference books:
1) Oscillations & Waves- Satya Prakash, Pragati Prakashan, Meerut, 3rd Edition
   (Chapter 4, pp. 161)
2) The Physics of Waves and Oscillations- N. K. Bajaj, Tata McGraw-HillPvt. Ltd., New Delhi, Reprint 2010
   (Chapter 5, pp. 177)
3) Classical Mechanics – Gupta Kumar Sharma, Pragati Prakashan, Meerut, Reprint 2016 *(Chapter 8)*
4) Introduction to Classical Mechanics- Nikhil Ranjan Ray, Vikas Publishing.
   (Chapter 12, pp 306-317)
5) Introduction to Classical Mechanics by R. G. Takwale& P. S. Puranik, McGraw hill education (India) Pvt,Ltd.
    (Chapter 6 pp 179)

3) Waves Motion and **Ultrasonic waves (7hrs)**

Waves Motion: Transverse waves on a string, travelling and standing waves on a string, Normal modes of a string, Group velocity and Phase velocity, Plane waves, Spherical waves. Ultrasonic waves: Piezo-electric effect, Production of ultrasonic waves by Piezo-electric generator, Detection of ultrasonic waves, Properties ultrasonic waves, Applications of ultrasonic waves.

Reference books:
1) Oscillations & waves-Satya Prakash, Pragati Prakashan, Meerut,3rd Edition
   (Chapter 8, pp315, 319)
2) A Text book of sound- Khanna and Bedi, Atma Ram & sons, Delhi
   (Chapter 4, pp 62)(Chapter 7, pp 135)(Chapter 3, pp46)(Chapter 22, pp442)
3) Waves and Oscillations-Subrahmanyam Brijlal, Vikas Publishing House Pvt. Ltd., New Delhi, 2nd Revised Edition
   (Chapter 12,pp 296)(Chapter 11, pp.282)
4) Waves and Oscillations – Dr. D. N. Tripathy, Kedarnant Ramnant Meerut , Delhi.
   (Chapter 14, pp259)
4) Physics for degree students- C. L. Arora and Dr. P. S. Hemne, S Chand & Company Pvt. Ltd., Second revised Edition, reprint 2014, Ram Nagar, New Delhi
   (Chapter 13 pp.511-556, chapter 15 pp. 571-602,)

Unit II (18 hrs)

1) Sound and Acoustics of buildings: (7 hrs)

Sound: Transducers and their characteristics, Pressure microphone, Moving coil loudspeaker, Intensity and loudness of sound, Decibels, Intensity levels, musical notes, musical scale.

Acoustics of buildings: Reverberation and time of reverberation, Absorption coefficient, Sabine's formula for measurement of reverberation time, Acoustic aspects of halls and auditoria.

Reference books:
1) A Text book of sound- Khanna and Bedi, Atma Ram & Sons, Delhi
   (Chapter 11Page No. 224)(Chapter 23Page No. 455)
2) Oscillations & waves-Satya Prakash, Pragati Prakashan, Meerut, 3rd Edition
   (Chapter 15, Page no. 515)
3) Waves and Oscillations-Subrahmanyam Brijlal, Vikas Publishing House Pvt. Ltd., New Delhi, 2nd Revised Edition
   (Chapter 7 pp 182)
4) Physics for degree students- C. L. Arora and Dr. P. S. Hemne, S Chand & Company Pvt. Ltd., Second revised Edition, reprint 2014, Ram Nagar, New Delhi,
   (Chapter 16 pp.605-619, chapter 18, pp.632-655)
5) Physics for engineering (Vol 1)- P. K. Palanisany, Scitech Publications (India) Pvt Ltd. *(Chapter 2)*
6) University Physics –Gurbachan S. Chaddha (chapter 3) Narosa Publishing House Pvt. Ltd. Delhi,(*pp. 3.1 - 3.18)*

2) Viscosity(5hrs)

Rate flow of liquid in a capillary tube - Poiseuille's formula, experimental determination of coefficient of viscosity of a liquid by Poiseuille's apparatus method, variations of viscosity of a liquid with temperature lubrication.

Reference books:

1) University Physics – FW Sears, MW Zemansky and HD Young, Addison Wesley

2) Elements of properties of matter-D. S. Mathur, S. Chand & Company Pvt. Ltd., New Delhi, Reprint 2016*(Chapter XII, pp 382)*

3) Physics of low pressure(6hrs)

Production and measurement of low pressure, Rotary pump, Diffusion pump, Molecular pump, Knudsen absolute gauge, Pirani gauge, Detection of leakage.

- **Reference books:**
  1) Mechanics- D. S. Mathur, S. Chand & company Pvt. Ltd., New Delhi, Reprint 2009
     (Chapter 15, pp 796)
  2) Elements of properties of matter-D. S. Mathur, S. Chand & company Pvt. Ltd., New Delhi, Reprint 2016
     (Chapter XV, pp508)
  3) Physics for engineering (Vol 1)- P. K. Palanisany, Scitech Publications (India) Pvt.Ltd.
     (Chapter 1)

SHIVAJI UNIVERSITY KOLHAPUR
CBCS Syllabus with effect from June, 2019
B. Sc. Part – II Semester-IV
PHYSICS Paper-VII
DSC-D1 THERMAL PHYSICS AND STATISTICAL MECHANICS – II
Theory: 36 Hours
Marks-50 (Credits: 02)

Unit I: **(18 hrs)**
1) **Thermodynamic Potentials**   **(10 hrs)**
   Enthalpy, Gibbs, Helmholtz, Internal Energy functions, Maxwell's thermodynamical relations, Joule-Thomson effect, Clausius- Clapeyron equation, Expression for $(C_P – C_V)$, C_P/C_V, TdS equations.

Reference books:
1) *Heat and Thermodynamics- M.W.Zemasky and R. Dittman (Ch. No. 11)*
2) *Physics for degree students B.Sc. second year- Arora, Hemne, S. Chand(Ch. No. 6)*

2) **Theory of Radiation**   **(8 hrs)**
Blackbody radiation and its importance, Experimental study of black body radiation spectrum, Concept of energy density, Derivation of Planck's law, Deduction of Wien's distribution law, Rayleigh-Jeans Law, Stefan Boltzmann Law and Wien's displacement law from Planck's law.
Reference books:
1) *Concepts of Modern Physics- Arthur Beiser(Ch. No. 9)*
2) *Physics for degree students B.Sc. second year- Arora, Hemne, S. Chand(Ch. No. 8)*

Unit II: Statistical Mechanics   **(18 hrs)**
1) **Classical statistics**   **(10hrs)**

Phase space, Microstate and Macrostate, Accessible microstates, priory probability thermodynamic probability, probability distribution, Maxwell-Boltzmann distribution law, evaluation of constants α and β, Entropy and Thermodynamic probability, Distribution of molecular speeds.
Reference books:
1) *Concepts of Modern Physics- Arthur Beiser(Ch. No. 9)*
2) *Physics for degree students B.Sc. second year- Arora, Hemne, S. Chand(Ch. No. 9, 11)*
2) **Quantum statistics**   **(8 hrs)**
Bose-Einstein distribution law, photon gas, Fermi-Dirac distribution law, electron gas, comparison of M.B., B.E., and F.D. statistics.
Reference books:
1) *Concepts of Modern Physics- Arthur Beiser(Ch. No. 9)*
2) *Physics for degree students B.Sc. second year- Arora, Hemne, S. Chand(Ch. No. 12)*

Reference books details:

1) Heat and Thermodynamics-M.W.Zemasky and R. Dittman, McGraw Hill.
2) Physics for degree students B.Sc. second year- Arora, Hemne, S. Chand.
3) Concepts of Modern Physics- Arthur Beiser, McGraw-Hill.
4) Thermal Physics, S. Garg, R. Bansal and C. Ghosh, 1993, Tata McGraw-Hill.
5) Thermodynamics, Kinetic theory & Statistical thermodynamics, F.W.Sears&G.L.Salinger. 1988, Narosa.
6) University Physics- Ronald Lane Reese, Thomson Brooks/Cole.
7) Heat Thermodynamics and Statistical Physics, N. Subramaniam, Brijlal, P. Hemne, 2008, S. Chand.

SHIVAJI UNIVERSITY KOLHAPUR
CBCS Syllabus with effect from June, 2019
<u>B. Sc.Part II Semester IV</u>
PHYSICS Paper VIII
DSC- D2 - WAVES AND OPTICS-II
Theory: 36 Hours
Marks -50 (Credits: 02)

Unit III (18 hrs)

1. Cardinal points (7 hrs)

Cardinal points of an optical system (definitions only), graphical construction of image using cardinal points, Newton's formula, relation between f and f ' for any optical system, relation between lateral, axial and angular magnifications.

References book: *Text book of optics- Brijlal and Subrahmanyam(Chaper no. 5)*

2. Resolving Power of optical instruments: (5 hrs)

Resolution, Resolving power of optical instruments, Rayleigh's criterion for the limit of resolution, Modified Rayleigh's criterion, comparison between magnification and resolution, resolving power of plane diffraction grating, resolving power of a prism.

Reference Books:
1) *Text book of optics- Brijlal and Subrahmanyam(Chaper no. 19)*
2) Waves and Optics- R. K. Verma (Chapter no. 9)
3) A text book of light- D. N. Vasudeva(Chapter no. 17)

3. Polarization of light: (6 hrs)

Idea of polarization, polarization by double refraction, Huygens explanation ofdouble refraction through uniaxial crystals, Nicol prism(construction, working), production and detection of circularly and elliptically polarized light, optical rotation - laws of rotation of plane of polarization, polarimeter.

Reference books:
1) *Text book of optics- Brijlal and Subrahmanyam (Chapter no. 20)*
2) *Fundamentals of Optics- Jenkins and white (Chapter no. 24)*
3) *A text book of light- D. N. Vasudeva(Chapter no. 18)*

UNIT-IV (18 hrs)

1. Interference: (10 hrs)

Principle of Superposition ,Coherence and condition for interference, Division of amplitude and division of wave front, Division of wave front – Lloyds single mirror(determination of wavelength of light of monochromatic source),Division of amplitude- Interference in thin parallel films (reflected light only), Wedge shaped films, Newton's rings and its application for determination of wavelength and refractive index of light.

Reference Books:
1) *Fundamentals of Optics- Jenkins and white (Chater no. 12,13 and 14)*
2) *Optics- Ajay Ghatak (Chapter no. 11, 12, 13 and 14)*
3) *Text book of optics- Brijlal and Subrahmanyam (Chaper no. 14 and 15)*
4) *Waves and Optics- R.K. Verma (Chapter no. 4)*

2. Diffraction: (8 hrs)

Fraunhofer diffraction- Elementary theory of plane diffraction grating, Determination of wavelength of light using diffraction grating, Theory of Fresnel's half period zones, Zone plate (construction , working and its properties), Fresnel's diffraction at a straight edge.

- **Reference Books:**
  1) *Fundamentals of Optics- Jenkins and white (Chater no. 15,16,17 and 18)*
  2) *Optics- Ajay Ghatak (Chapter no. 16 and 17)*
  3) *Text book of optics- Brijlal and Subrahmanyam (Chaper no. 17 and 18)*

Reference Book Details:
1. Text book of optics for B.Sc.Classes- BrijLal and N.Subrahmanyam, S.Chand & Company Ltd. New Delhi, 2006
2. Wave Optics- R. K. Verma, Discovery Publishing House New Delhi, 2006
3. A text book of light- 8th Edition,D. N. Vasudeva, Atma Ram & Sons, Delhi (1976)
4. Fundamentals of Optics- 4th Edition ,Francies A.Jenkins and Harvey E.White, Tata McGraw-Hill Education Private Ltd., New Delhi 2011
5. Optics- 2nd Edition, Ajay Ghatak, Tata Mcgraw-Hill Publishing Company Ltd., New Delhi,
6. Principles of Physics-10th Edition, Halliday and Resnick, Wiley
7. University Physics- 14th Edition, H.D. Young and R. A. Freedman, Pearson

PHYSICS LAB DSC C1-D1: Paper V–VII
THERMAL PHYSICS AND STATISTICAL MECHANICS

1. To determine the value of Stefan's Constant.
2. To determine the coefficient of thermal conductivity of copper by Searle's Apparatus.
3. To determine the Coefficient of Thermal Conductivity of Cu by Angstrom's Method.
4. To determine the coefficient of thermal conductivity of a bad conductor by Lee andCharlton's disc method.
5. To determine the temperature co-efficient of resistance by Platinum resistancethermometer.
6. To study the variation of thermo e.m.f. across two junctions of a thermocouple with temperature.
7. To record and analyze the cooling temperature of hot object as a function of timeusing a thermocouple.
8. To calibrate Resistance Temperature Device (RTD) using Null Method/Off-Balance Bridge
9. To determine the temperature coefficient of resistance using post office box.
10. To verify Stefan's fourth power law.
11. To determine specific heat of graphite.
12. To determine the ratio of specific heat of air by Kundt's tube.
13. Temperature of flame
14. To determine the coefficient of thermal conductivity of glass in the form of tube.
15. To determine the thermal conductivity of metal bar by Forbes's method.
16. To determine Mechanical Equivalent of Heat, J, by Callender and Barne's constant flow method.

PHYSICS LAB DSC C2-D2: Paper VI and Paper VIII - WAVES AND OPTICS

1. To investigate the motion of coupled oscillators
2. To determine the frequency of an electrically maintained tuning fork by Melde's experiment and to verify λ^2– T Law
3. To study Lissajous figures by using CRO
4. To determine coefficient of viscosity of water by capillary flow method (Poiseuille's method)
5. To determine velocity of sound in air by Kundt's tube and audio oscillatoror Phase shift method (CRO and microphone).
6. To determine viscosity of liquid by Searle's viscometer.
7. To determine velocity of sound in air by resonating bottle.
8. To determine frequency of a crystal oscillator.
9. To determine the Resolving Power of a Prism.
10. To determine the Resolving Power of a Plane Diffraction Grating.
11. To determine wavelength of sodium light using diffraction due to straight edge.
12. To determine wavelength of sodium light using Newton's Rings.
13. Determine thickness of thin film using interference in wedge shaped thin film.
14. Goniometer I-To study cardinal points of optical system.
15. Goniometer II- To study the equivalent focal length of optical system.
16. To study angle of specific rotation of sugar using Polarimeter.

Reference Books for practical:

1. Advanced Practical Physics for students, B.L. Flint & H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practical, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition,2011, Kitab Mahal, New Delhi.
4. B.Sc. Practical Physics, C.L.Arora, S.Chand & Company Pvt.Ltd., New Delhi

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SHIVAJI UNIVERSITY, KOLHAPUR.

Accredited By NAAC with 'A' Grade

Revised Syllabus For

B.Sc Part- III

Physics

Syllabus to be implemented from

June, 2020 onwards.

SHIVAJI UNIVERSITY, KOLHAPUR

B.Sc. Part-III Physics CBCS Syllabus with effect from June 2020

B.Sc. Part-III Semester-V

PHYSICS Paper-IX

DSE-E1 Mathematical Physics

Theory: 36 Hours (45 Lectures of 48 minutes)

Marks -50 (Credits: 02)

UNIT-I

1. **Partial Differential Equation** (8 hours)

   Introduction to differentialequations, Method of separation of variables for solving second order partial differential equations, Form of two dimensional Laplace differential equation in Cartesian coordinates and its solution, Three dimensional partial differential equation in Cartesian coordinates and its solution, The differential equation of progressive wave and its solution.

2. **Frobenious Method and Special Functions** (10hours)

   Singular points of second order differential equations, Application of singularity to Legendre and Bessel differential equation, Series solution method of solving second order linear differential equation(Frobenious method) and its application to Legendre differential equation.

UNIT-II

1. **Some Special Integrals** (6 hours)

   Gamma function, Properties of Gamma function, Beta function, Properties of Beta function,Relation between Beta and Gamma functions, Error function (Probability Integral).

2. **Complex Analysis** (12 hours)

   Revision of complex numbers and their graphical representation: Geometrical representation, Equal complex numbers, Addition, Subtraction, Multiplication and Division of complex number by geometry. Types of complex numbers, square roots of complex numbers, Logarithmic function of complex variables, Euler's formula, De'Moivre's theorem, Cauchy-Riemann conditions.

Reference Books

1. Advanced calculus, Robert C. Wrede, Murray Spiegel.

2. Differential Equations with Modeling Applications, Dennis G.Zill.

3. Partial Differential Equations,Gupta Malik and Mittal.

4. Differential Equations,Gupta Malik and Mittal.

5. Differential Equations,RamachandraRao,H. R. Anuradha.

6. Partial Differential Equations, N. P. Bali.

7. Differential Equations, N. Ch. S. N. Iyenger.

8. Mathematical Physics, B. S. Rajput.

9. Mathematical Methods for Physicists, Arfken, Weber, 2005, Elsevier.

10. Mathematical Methods for Scientists and Engineers, McQuarrie, 2003, Viva Books.

11. Mathematical Physics, H. K. Das, Rama Varma.

12. Essential Mathematical methods, K. F. Riley, M. P. Habson, 2011,Cambridge.

13. Mathematics for Physicists, Susan M.Lea, 2004, Thomson Books/Cole.

B.Sc. Part-III Semester-V
PHYSICS Paper-X
DSE-E2 Quantum Mechanics
Theory: 36 Hours (45 Lectures of 48 minutes)
Marks -50 (Credits: 02)

Unit-I

1. Matter Waves **(08 hours)**

Wave particle duality, De-Broglie hypothesis of matter waves, Derivation of wavelength of matter wave, Concept of wave packet, Relation between group velocity - phase velocity and group velocity-particle velocity, Davisson and Germer experiment, Uncertainty principle (statements only): position–momentum and energy- time, Application of uncertainty principle-non existence of free electrons in the nucleus.

2. Schrodinger's Wave Equation **(10 hours)**

Wave function and its physical interpretation, Condition of physically acceptable wave function, Normalized and orthogonal wave function, Schrödinger time dependent and time independent (steady state) wave equations in 1D and 3D, Probability current density(continuity equation), Eigen values and Eigen functions, Expectation values of dynamic variables.

Unit-II

1. Operators in Quantum Mechanics **(08 hours)**

Definition of an operator, Position operator (x), Linear momentum operator (p), Commutation relation in quantum mechanics, Commutation relation between x and p, Kinetic energy operator (T), Hamiltonian operator (H), Parity operator (π), Angular momentum operator (L) – components of angular momentum operator in Cartesian coordinate system, Ladder operators, Eigen values of L_z and L^2 (use equations for L^2 and Lz in spherical polar coordinates).

2. Applications of Schrodinger Equation **(10 hours)**

Particle in a rigid box (infinite potential well) in one dimension and three dimension, Step potential- reflection and transmission coefficients, Potential barrier- tunneling effect (qualitative treatment), One dimensional simple harmonic oscillator (operator method)- energy levels, zero point energy, Schrodinger equation for Hydrogen atom in spherical polar coordinates, Separation of radial and angular parts, Solution of radial part of Schrodinger's equation - Energy Eigen values.

Reference Books

1. Modern Physics, R. Murugeshan, 1997, S. Chand and Company Ltd.

2. Atomic Physics, J B Rajam, S Chand and Co.

3. Perspectives of Modern Physics, Arthur Beiser, McGraw Hill International Editions.

4. Concepts of Modern Physics, Arthur Beiser, Ahobhit Mahajan, S. Rai Choudhury, Sixth Edition, Tata McGraw Hill Education Private Ltd.

5. Modern Physics, S. L. Kakani and Shubhra Kulkarni, 2006, Viva books Private Ltd.

6. Modern Physics, D. L. Sehgal, K. L. Chopra and N. K. Sehgal, Reprint 1995, Sultan Chand & sons.

7. Introduction to Modern Physics, F. K. Richtmyer, E. H. Kennard, John N. Cooper, Sixth Edition, Tata McGraw Hill Education Private Ltd

8. A Text book of Quantum Mechanics, P.M. Mathews & K. Venkatesan, 2nd Edn.,2010, Tata McGraw Hill,

9. Quantum Mechanics, Leonard I. Schiff, 3rdEdn. 2010, Tata McGraw Hill.

10. Quantum Mechanics Theory and Applications, A. K. Ghatak and S. Lokanathan, Third Edn.1995, Macmillan India Ltd.

11. Quantum Mechanics Theory and applications, AjoyGhatak, S. Lokanathan, 5th Ed,2017, Trinity.

12. Quantum Mechanics, Chatwal and Anand, Reprint 2010, Himalaya Publishing house.

13. Quantum Mechanics, Gupta, Kumar, Sharma, Thirtieth Edn., 2011, Jai Prakash Nath Publications.

14. Advanced Quantum Mechanics, SatyaPrakash, Reprint 2011, KedarNath Ram Nath Meerut.

15. Advanced Quantum Mechanics, B. S. Rajput, Ninth Edn., 2009, Pragati Prakashan.

16. Quantum Mechanics, B. N. Srivastava, Reprint 2011, Pragati Prakashan.

17. Quantum Mechanics, P. J. E. Peebles, 2003, Prentice Hall of India.

18. Quantum Mechanics, S. P. Singh,M. K. Bagade, Kamal Singh, S. Chand & company Ltd, New Delhi

B.Sc. Part-III Semester-V
PHYSICS Paper-XI
DSE-E3 Classical Mechanics and Classical Electrodynamics
Theory: 36 Hours (45 Lectures of 48 minutes)
Marks -50 (Credits: 02)

UNIT-I

1.Lagrangian Formulation (10 hour)

Constraints, Degrees of freedom, Generalized coordinates, Principle of virtual work, D'Alembert's principle, Lagrange's equation from D'Alembert's principle, Applications of Lagrange's equation to a particle in space, Atwood's machine and a bead sliding on uniformly rotating wire under force free condition.

2.Techniques of Calculus of Variation (8 hour)

Hamilton's principle, Deduction of Hamilton's principle from D'Alembert's principle, Deduction of Lagrange's equation from Hamilton's principle, Applications-shortest distance between two points in a plane,Brachistochrone problem.

UNIT- II

1.Special Theory of Relativity (12 hours)

Inertial and non-inertial reference frames, Galilean transformation equations, Michelson-Morley experiment, postulates of special theory of relativity, Lorentz transformation equations, Relativistic addition of velocities, Length contraction, Time dilation, Variation of mass with velocity, Mass-energy relation.

2. Charged Particles Dynamics (6 hours)

Poisson's and Laplace's equations and their physical significance, Laplace's equation in one dimension and its solutions, Motion of charged particle - in uniform electric field E, magnetic field B, Crossed uniform electric field E and magnetic field B.

Reference Books

1. Classical Mechanics, Goldstein Herbert, NarosaPubli./ Pearson Edu. 2018
2. Classical Mechanics, Gupta, Kumar and Sharma, Pragati Praka.2012
3. Introduction to Classical Mechanics, Nikhil Ranjan Roy, S Chand Publ. 2016
4. Introduction to Classical Mechanics,Takwale R.G., Puranik P. S.,Tata McGraw 1979
5. Classical Mechanics,Panat P.V., NarosaPubli. 2016
6. Atomic physics, J B Rajam S Chand
7. Concepts of Modern Physics, ArthurBeiser, McGraw Hill
8. Introduction to Special Relativity, Robert Resnick, Wiley India
9. Classical Electrodynamics, PuriS.P., Tata McGraw/Alpha Science 2011
10. Classical Electrodynamics, Jackson J. D., Wiley India , 2007
11. Electromagnetics, Laud B.B., New Age Interna. 2011

B.Sc. Part III-Semester-V
PHYSICS Paper-XII
DSE-E4 Digital and Analog Circuits and Instrumentation
Theory: 36 Hours (45 Lectures of 48 minutes)
Marks -50 (Credits: 02)

Unit-I

1.Digital Electronics (08 hours)

Review of basic logic gates, Derived logic gates (NOR, NAND, XOR and XNOR gates), NAND and NOR gates as universal gates, De Morgan's theorems, R-S flip flop, J-K flip-flop, Half adder, Full adder, 4 bit parallel binary adder.

2.TransistorsAmplifier and Sinusoidal Oscillators (10 hours)

Transistor Amplifier: Single stage transistor CE amplifier, D.C. and A.C. equivalent circuits, load line analysis-d.c. load line, a.c. load line and Q point.

Oscillator: Feedback in amplifiers and its types,theory of feedback oscillator, Barkhausen's criterion for sustained oscillations,Oscillatory circuit (tank circuit),essentials of transistor oscillator, sinusoidal oscillators-phase shift oscillator, Colpitts oscillator, Hartley oscillator, Crystal oscillator using transistors.

Unit-II

1. Cathode Ray Oscilloscope (8 hours)

Introduction to CRO, Block diagram of CRO, Principle, Construction and working of CRT, Applications of CRO: measurement of A.C. and D. C. voltages, periodic time, frequency and phase difference, Lissajous figures.

2. Operational Amplifier and Timer (10 hours)

Operational Amplifier: Differential amplifier and its type, Op-Amp, Block diagram of an Op- Amp. Op-Ampparameters, Characteristics of an ideal and practical Op-Amp (IC 741), Applications of Op-Amps: Inverting amplifier and Non-inverting amplifier, Adder, Subtractor, Differentiator, Integrator.

Timer IC: Block diagram of IC555, IC 555 Pin configuration, Applications of IC 555 as astable and monostablemultivibrator.

ReferenceBooks

1. Integrated Electronics, J. Millman and C.C. Halkias, 1991, Tata Mc-Graw Hill.
2. Electronic devices and circuits, S. Salivahanan and N. Suresh Kumar, 2012, Tata Mc-Graw Hill.
3. Microelectronic Circuits, M.H. Rashid, 2ndEdn.,2011, Cengage Learning.
4. Modern Electronic Instrumentation & Measurement Tech., Helfrick&Cooper,1990, PHI Learning
5. Digital Principles & Applications, A.P. Malvino, D.P. Leach &Saha, 7thEd.,2011, Tata McGraw Hill
6. Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, 2014, 6thEdn., Oxford University Press.
7. Fundamentals of Digital Circuits, A. Anand Kumar, 2ndEdition, 2009, PHI Learning Pvt. Ltd.
8. OP-AMP and Linear Digital Circuits, R.A. Gayakwad, 2000, PHI Learning Pvt. Ltd.
9. Basic Electronics: A text lab manual, P.B. Zbar, A.P. Malvino, M.A. Miller, 1994, Mc-Graw Hill.
10. Electronics: Fundamentals and Applications, J.D. Ryder, 2004, Prentice Hall.
11. Electronic Principle, Albert Malvino, 2008, Tata Mc-Graw Hill.
12. A text book of Electronics, SantanuChattopadhay, New Central Book Agency, Kolkata
13. Basic Electronics, 2ndEdition , B. Basavaraj, H. N. Shivashankar, Vikas Publishing house pvt. Ltd. New Delhi.
14. Electronic principles, V. K. Mehta
15. Basic Electronics, Bhargava and Gupta

B.Sc. Part-III Semester-VI
PHYSICS Paper-XIII
DSE-F1 Nuclear and Particle Physics
Theory: 36 Hours (45 Lectures of 48 minutes)
Marks -50 (Credits: 02)

Unit-I

1. General Properties of Nuclei and Nuclear Model   (10 hours)

Constituents of nucleus and their intrinsic properties, Quantitative facts about size, mass, chargedensity (matter energy), binding energy, average binding energy and its variation with mass number,Liquid drop model approach, Semi empirical mass formula, Magic numbers.

2. Particle Accelerators   (8 hours)

Need of accelerators,Cyclotron- construction, working, theory and its limitations,Principle of phase stable orbit, Synchrocyclotron - construction and working, Synchrotrons- electron synchrotron and proton synchrotron, Betatron - principle, construction and workingcondition, expression of energy gain.

Unit-II

1. Nuclear Detectors   (10 hours)

Ionization chamber, Geiger Muller counter- construction, working and theory, dead time and recoverytime, quenching mechanism, Construction of photo-multiplier tube (PMT), Scintillation detector-principle, construction and working, Wilson cloud chamber, Semiconductor detector, Cerenkovradiations, Cerenkov detector.

2. Particle Physics   (8 hours)

Particle interactions, Classification of elementary particles, Symmetries and conservation laws-energy,momentum, angular momentum and parity, Baryon number, Lepton number, Concept of quark model.

ReferenceBooks

1. Introductory nuclear Physics, Kenneth S. Krane (Wiley India Pvt. Ltd., 2008).

2. Concepts of nuclear physics, Bernard L. Cohen. (Tata Mcgraw Hill, 1998).

3. Introduction to the physics of nuclei & particles, R.A. Dunlap. (Thomson Asia, 2004)

4. Introduction to Elementary Particles, D. Griffith, John Wiley & Sons

5. Quarks and Leptons, F. Halzen and A.D. Martin, Wiley India, New Delhi

6. Basic ideas and concepts in Nuclear Physics - An Introductory Approach by K. Heyde (IOP-Institute of Physics Publishing, 2004).

7. Radiation detection and measurement, G.F. Knoll (John Wiley & Sons, 2000).

8. Theoretical Nuclear Physics, J.M. Blatt &V.F.Weisskopf (Dover Pub.Inc., 1991)

9. Nuclear Physics by John Lilley,The Manchester Physics Series – Willy

10. Nuclear Physics by S. B. Patel, New age international (p) lit. Publishers New Delhi.

11. Modern Physics by R. Murugeshan, S. Chand & company Ltd, Ram Nagar New Delhi

12. Nuclear Physics by D. C. Tayal, Himalaya Publishing house

13. Concept of modern physics by ArthirBeiser, Tata McGraw- Hill publishing company ltd. New Delhi

14. Atomic and nuclear structure by D. K. JHA, Discovery publishing house New Delhi

15. Nuclear energy by D. K. JHA Discovery publishing house New Delhi)

16. Nuclear physics by S. N. Ghoshal , S. Chand & company Ltd, Ram Nagar New Delhi

B.Sc. Part-III Semester-VI
PHYSICS Paper-XIV
DSE-F2 Solid State Physics
Theory: 36 Hours (45 lectures of 48 min)
Marks-50 (Credits: 02)

Unit-I

1. Crystal Structure   (10 hours)

Solids: amorphous, polycrystalline and crystalline materials; lattice, basis, unit cell- primitive, non-primitive unit cell, symmetry operations, symmetry elements of cube, Bravais lattice in two and three dimensions, Miller indices, Miller indices andinter-planer spacing, Simple crystal structures: SC, BCC, FCC and HCP(Co-ordination number, atomic radius, atoms per unit cell and packing fraction)

2. X-Ray Diffraction   (08 hours)

Reciprocal lattice and its properties, Brillouin zone, Diffraction of X-rays by crystals, Ewald construction, Bragg's law in reciprocal lattice, Experimental methods in X-ray diffraction (Laue method,rotating crystal method,powder photograph method),Analysis of cubic crystal by powder method.

Unit-II

1. Magnetic Properties of Matter   (10 hours)

Classical Langevin theory of diamagnetic and paramagnetic materials, Quantum mechanical treatment of paramagnetism, Curie's law, Weiss theory of ferromagnetism and ferromagnetic domains, Explanation of B-H curve, Hysteresis and energy loss.

2. Elementary Band Theory of Solids   (8 hours)

Concept of density of states, Bloch theorem (statement only), Kroning–Penny model, Origin of energy gap, Velocity of electrons according to band theory, Effective mass of an electron, Distinction between metals, semiconductors and insulators, Hall Effect - Hall voltage and Hall Coefficient.

Reference Books

1. Introduction to Solid State Physics, Charles Kittle, 8th Ed.,2004,Wiley India Pvt. Ltd.
2. Elements of Solid State Physics, J.P. Srivastava, 2nd Ed., 2006,Prenice-Hall of India
3. Introduction to Solid, Leonid V.Azaroff,2004,Tata Mc-Graw Hill
4. Solid State Physics, Neil W. Aschroft and N. David Mermin, 1976, Cengage Learning
5. Solid State Physics,Rita John,2014,Mc-Graw Hill
6. Solid State Physics, Adrianus J. Dekker, Macmillan Publishers India Ltd.
7. Solid State Physics, M.A.Wahab,3rd Ed.,2018,Narosa Publishing House Pvt. Ltd.
8. Solid State Physics, S.O.Pillai,5th Ed., New Age International(P) Ltd., Publishers.
9. Fundamentals of Solid State Physics, Saxena-Gupta-Saxena, (PragatiPrakashan Meerut)
10. Solid State Physics, R. L. Singhal
11. Solid State Physics, C.M. Kachhava (Tata McGraw Hill Publication)
12. Elements of X-ray diffraction, B.D.Cullity and S.Stock
13. Solid state electronic devices, B.G.Streetman& S.K.Banerjee,5thEd.[PHI Learning Delhi.

PHYSICS Paper-XV
DSE-F3 Atomic and Molecular Physics and Astrophysics
Theory: 36 Hours (45 Lectures of 48 minutes)
Marks -50 (Credits: 02)

UNIT-I

1. Atomic Spectra (09 hours)

Observed hydrogen fine structure, Spectral notations and optical spectral series for doublet structure, Spectrum of sodium and its doublet fine structure, Selection and intensity rules for fine structure doublets, Normal order of fine structure doublets, Electron spin-orbit interaction,Normal and anomalous Zeeman effect and their explanation from vector atom model, Lande's g factor.

2. Molecular Spectra (09 hours)

Molecular bond, Electron sharing, H_2^+ molecular ion, The hydrogen molecule, Rotational energy levels, Rotational spectra, Vibrational energy levels, Vibrational spectra, Vibration – rotation spectra, Electronic spectra of diatomic molecules.

UNIT-II

1 Raman Spectra (4 hours)

Raman Effect,Characteristic properties of Raman lines, Classical and quantum theory of Raman Effect,Difference between Raman spectra and infrared spectra.

2. Structure of Universe: (08 hours)

Big-Bang theory, Steady state theory, Oscillating theory,Hubble law, Cosmological tests, Milky Way galaxy, Origin of solar system - Condensation theory; arguments for and against the theory.

3. Stellar Evolution (06 hours)

The H–R Diagram,Evolution of main sequence stars - Red giants and White dwarfs, Evolution of more massive stars- Supernova, Neutron star, Black hole,Surface of the Sun, Sunspots, Sunspot cycle.

Reference books

1. Atomic and Nuclear Physics – H. Semat and T. E. Albright.

2. Introduction to Atomic Spectra – H. E. White.

3. Concepts of Modern Physics – Arthur Beiser.

4. Perspectives of Modern Physics – Arthur Beiser.

5. Spectroscopy (Atomic and Molecular) – Gurdeep Chatwal, Sham Anand.

6. Astronomy – Fundamentals and Frontiers – Robert Jastrow and M. H.Thompson

7. Astronomy – Frank Bash.

8. Foundation of Astronomy, Michael A. Seeds,10th edition, Thomson Learning, Inc., USA, 2008.

PHYSICS Paper-XVI

DSE-F4 Energy Studies and Materials Science

Theory: 36 Hours (45 lectures)

Marks 50 (Credits: 02)

UNIT-I

1. Energy and Wind Energy   (8 hrs)

Energy, Forms of energy, Man and environment, Energy chains, Classification of energy resources, Energy demands, Age of renewable and alternatives,Wind energy, Wind energy chains, Wind energy quantum, Planning of wind farm, Wind power density, Efficiency factor of wind turbine (P-H graph), Power of wind turbine for a given incoming wind velocity, Types of a wind turbine generator unit, Horizontal axis propeller type wind turbine generator unit.

2. Solar Energy   (8 hrs)

Solar energy, Solar energy spectrum (UV,Visible and IR), Utilization of solar energy-thermal route, photovoltaic route, Essential subsystems in solar energy plant, Solar constant, Clarity index, Solar insolation, Solar energy from satellite station through microwave to earth station, Solar photovoltaic systems, Merits and limitations of solar PV systems, Prospects of solar PV systems, Power of a solar cell and solar PV panel.

3. Biomass Energy   (2 hrs)

Origin of biomass, Biomass energy resources (biomass from cultivated crops, biomass from waste organic matter), Biomass conversion process (biochemical conversion-anaerobic digestion and fermentation)

UNIT-II

1. Superconductivity   (6 hrs)

Idea of superconductivity, Critical temperature, Critical magnetic field, Meissner effect, Type-I and Type-II superconductors, London equation and penetration depth, Isotope effect, Application (magnetic levitation)

2. Nanotechnology   (12 hrs)

Introduction tonanoscience and nanotechnology, Length scales relevant to nanoscience, Nanostructures: 1D, 2D and 3Dnanostructures, Size effects in nanosystems, Quantum

confinement, Synthesis of nanostructured materials(Top down and bottom up approach), Photolithography, Ball milling,Nucleation and growth, Applications of nanotechnology (Spintronics, Molecular electronics, Nanobiotechnology)

ReferenceBooks

1. Energy Technology – Non-conventional, Renewable and Conventional – S. Rao and Dr. Parulekar.

2. Non-conventional Energy sources - G. D. Rai (4th edition), Khanna Publishers, Delhi.

3. Solar Energy - S.P. Sukhatme (second edition), Tata Mc.Graw Hill Ltd, New Delhi.

4. Solar Energy Utilization - G. D. Rai (5th edition), Khanna Publishers, Delhi.

5. Non-conventional Energy Sources – G. D. Rai (Khanna Publishers).

6. Elements of Material Science and Engineering - I.H.Vanvlach (4th Edition)

7. Material Science and Engineering - V. Raghva

8. Material science and metallurgy for Engg.-Kodigire V. D. Everest publication house, Pune

9. Material Science and Engg. - 5th Edition- V. Raghavan PHI Learning Pvt. Ltd. Delhi

10. Nanotechnology: Principles and Practices,Sulbha K Kulkarni (2nd Edition), Capital Publishing Co. New Delhi.

11. Science at the Nanoscale: An Introductory Textbook, Chin Wee Shong, ChorngHaur Sow, Andrew T. S. Wee (Pan Stanford Publishing Pte. Ltd.)

12. Introduction to Nanoscience, S.M. Lindsay (Oxford University press)

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B.Sc.Part III Physics Laboratory Experiments
Total Marks: 200 Credits: 08

- **Group-I**

1. Resonance pendulum
2. S.T. of soap solution
3. Surface tension of mercury by Fergusson modified method
4. Y and η using Flat Spiral Spring
5. Y by Koenig's method
6. Y by Cornu's spiral
7. C program to arrange the given set of numbers in ascending/descending order
8. C program to findlargest/smallest number from a given set of numbers
9. Scilab Expt. 1 (problem from Quantum Mechanics)
10. Scilab Expt. 2 (problem from Quantum Mechanics)

- **Group-II**

1. Cardinal points by turn table method
2. Cardinal points by Newton's method
3. Refractive index of glass by Brewster's law
4. Diffraction at a Single Slit
5. Diffraction at cylindrical obstacle
6. Lloyd's single mirror
7. Double refracting prism
8. Diameter of Lycopodium powder
9. Spherical aberration
10. Absorption spectrum of a liquid ($KMnO_4$ solution)

- **Group-III**

1. Self Inductance by Owen's Bridge
2. Measurement of B_H, B_V and θ using Earth Inductor /Hysteresis by magnetometer method
3. Mutual inductance using Ballistic galvanometer.
4. Resistance of B.G. by half deflection method
5. e/m of Electron By Thomson's Method/Calibration of wire by Carey Foster bridge
6. Calibration of wire by Griffith's method

7. Absolute capacity of condenser

8. I-V characteristics of Solar Cell

9. Band gap energy of semiconductor using p-n junction diode

10. Determination of Plank's constant by using LED

- **Group–IV**

1. To verify the truth tables of NAND, NOR, Ex-OR and Ex-NOR gates by usingbasic gates with IC-74 series.

2. To verify the De-Morgan's theorems by using IC-74 series.

3. To design a single stage CE amplifier of given gain using voltage divider bias.

4. To built and test Colpitts oscillator using BJT.

5. To builtand test phase shift oscillator using BJT.

6. To determine A.C. and D.C. sensitivity of the C.R.O. andto measure unknown frequency.

7. To design and test an astablemultivibrator using IC-555 Timer.

8. To design and testmonostablemultivibratorusing IC-555 Timer.

9. To studyOp-amp as an inverting amplifier.

10. To study Op-amp as Schmitt trigger.

Skill Testing Experiments

- **Group-V-A**

1. Study of divergence of LASER beam

2. Measurement of wavelength of LASER using plane diffraction grating

3. Schuster's method and optical leveling of spectrometer

4. Obtaining Biprism fringes without lateral shift

5. Measurement of distance between two coherent sources in Biprism experiment

6. Polar graph using photocell/photovoltaic cell

7. Study of quantum tunneling effect using tunnel diode

8. Testing of electronic components

9. C program – Edit,save and execute given C program

10. C program – Edit,save and execute given C program

- **Group – V-B**
    1. Radius of Capillary bore using mercury thread
    2. Determination of lattices constant using given XRD powder pattern
    3. Estimation of errors
    4. Measurement of phase shift of RC network using CRO
    5. Study of Half and Full adder
    6. Simplification of digital circuit using Boolean laws (paper-work).
    7. Measurement of resistance of galvanometer (Kelvin's method)
    8. Electrical wiring of bulb, switch and plug.
    9. Tracing of given electronic circuit/ build the given circuit using breadboard
    10. Assembling of given electronic circuit(soldering method)

- **Group VI: Assessment of Annual Work of a Student**
    1. Certified Laboratory Journal.
    2. Study Tour Report.
    3. Seminar Report (2 Seminars) / Project work.

- **Reference Books for practical**

1. Advanced Practical Physics for students, B.L. Flint & H.T. Worsnop, 1971, Asia Publishing House.
2. Advanced level Physics Practical, Michael Nelson and Jon M. Ogborn, 4th Edition, reprinted 1985, Heinemann Educational Publishers
3. A Text Book of Practical Physics, Indu Prakash and Ramakrishna, 11th Edition,2011, Kitab Mahal, New Delhi.
4. B.Sc. Practical Physics, C.L.Arora, S.Chand & Company Pvt.Ltd., New Delhi
5. B.Sc. Practical Physics, Harman Singh,Hemane, 2012 Edition.

- **Revised Scheme of Practical Examination for B. Sc. Part – III**

1. Practical examination will be conducted annually.
2. Practical examination will be conducted for three days per batch.
3. The examination will be conducted in two sessions per day and each session will be of three hours duration.

4. Every candidate should perform one experiment each from Groups I to IV and one experiment each from Group V-A and Group V-B (total 6 experiments).

5. Study tour anywhere in India is compulsory.

6. At least eighty percent practical should be completed by the student.

7. The marks distribution for practical is as below.

Practical groups	Marks
Group I	30
Group II	30
Group III	30
Group IV	30
Group VA-15, Group VB-15	30
Group VI I)Certified laboratory journal (certified Journal- 10 marks, neatness-5 marks, punctuality- 5 marks)	20
II) Study Tour Report	10
III) Seminar Report / Project Report	20
Total Marks	**200**

Nature of Question Paper

Theory: Time -2 hours, Marks-50

Question 1: Select the correct alternative (Compulsory 10 questions) 10 marks

(Four alternatives for each question)

Question 2: (Attempt any Two out of three) 20 marks

(Long answer type)

Question 3: (Attempt any four out of six) 20 marks

(Short answer type)

- **Note:** Equal weightage should be given to each unit.

SHIVAJI UNIVERSITY, KOLHAPUR.

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CHOICE BASED CREDIT SYSTEM

Syllabus For

Bachelor of Science (Part III) Statistics

Syllabus to be implemented from June 2020 onwards

Shivaji University, Kolhapur
B. Sc. III Statistics
Structure of the course
To be implemented from June 2020
Theory

Semester V

Paper. No.	Title of the paper	Total Marks
IX	Probability Distributions	50
X	Statistical Inference - I	50
XI	Design of Experiments	50
XII	R-Programming and Quality Management	50

Semester VI

Paper. No.	Title of the paper	Total Marks
XIII	Probability Theory and Applications	50
XIV	Statistical Inference - II	50
XV	Sampling Theory	50
XVI	Operations Research	50

Practical

Paper No.	Title of the Practical	Marks for Practical	Journal	Oral	Total Marks
IV	Probability Distributions	32	4	4	40
V	Statistical Inference	32	4	4	40
VI	Designs of Experiments and Sampling Methods	32	4	4	40
VII	R-Programming, Quality Managementand Operations Research	32	4	4	40
	A Project Report & Viva -voce	40	-	-	40

1. Nature of Project

   (i) Identification of problem where statistical techniques can be used.

   (ii) Planning and execution of data collection.

   (iii) The Marking system for the project work is as follows:

       • Data Collection   : 8 Marks

       • Use of Statistical Tools : 8 Marks

       • Analysis of Data   : 8 Marks

       • Conclusion   : 8 Marks

       • Viva on Project   : 8 marks

       Total Marks of Project   : 40 marks

   (iv) Project will be conducted in a group of 5 to 6 students.

2. Nature of Question papers (Theory)

COMMON NATURE OF THEORY QUESTION PAPER WILL BE MENTIONED SPERATELY:

3. Nature of practical papers:

   (i)   Each practical question paper must contain **Four** questions.

   (ii) Each question should contain **Two** bits from different units.

   (iii) Student shouldattempt **Any Two** questions.

   (iv) Each question should carry **16**marks and to be distributed according to followingpoints:

      (a)   Aim of the Experiment   : 2 Marks

      (b)   Statistical formulae   : 4 Marks

      (c)   Observation Tables   : 4 Marks

      (d)   Calculations   : 4 Marks

      (e)   Conclusion/ result of the experiment   :2 Marks.

  (v) In each practical paper, four marks are reserved for journal and four marks are reserved for oral.

4. Instructions:

      (i)   While attempting questions based on R-software students have to write the commands of R-software on their Answer-book. Final result should be shown to the examiner online or the printout may be attached.

      (ii) Duration of each practical paper should be of four hours.

      (iii) Student can use MS-Excel or electronic calculators for other practical.

5. Requirements:
(i) There should be two subject experts at the time of practical examination.
(ii) Laboratory should be well equipped with 20 scientific calculators, 20 computers, 2 printers with sufficient backup facility (UPS/Inverter /Generator).

EQUIVALENCE FOR THEORY PAPERS
(From June 2020)

Old Syllabus		Revised Syllabus	
Paper No.	Title of the Paper	Paper No.	Title of the Paper
Sem.V / P. IX	Probability Distributions	Sem.V / P. IX DSE-E13	Probability Distributions
Sem. V/ P.X	Statistical Inference - I	Sem. V/ P.X DSE-E14	Statistical Inference - I
Sem. V / P XI	Design of Experiments	Sem. V / P XI DSE-E15	Design of Experiments
Sem. V / P XII	Operations Research	Sem. V / P XII DSE-E16	R-Programming and Quality Management
Sem. VI / P XIII	Probability Theory	Sem. VI / P XIII DSE-F13	Probability Theory and Applications
Sem. VI / P XIV	Statistical Inference - II	Sem. VI / P XIV DSE-F14	Statistical Inference - II
Sem. V / P XV	Sampling Theory	Sem. V / P XV DSE-F15	Sampling Theory
Sem. VI / P XVI	Quality Management and Data Mining	Sem. VI / P XVI DSE-F16	Operations Research

EQUIVALENCE FOR PRACTICAL PAPERS
(From June 2020)

Old Syllabus		Revised Syllabus	
Paper No.	Title of the Practical Paper	Paper No.	Title of the Practical Paper
IV	Probability Distributions and R software	IV	Probability Distributions
V	Statistical Inference	V	Statistical Inference
VI	Design of Experiments and Sampling Methods	VI	Design of Experiments and Sampling Methods
VII	Operations Research and Quality Management	VII	R-Programming, Quality Managementand Operations Research

B. Sc. Part-III Semester V
SUBJECT – STATISTICS - IX
DSE-E13: ProbabilityDistributions
Theory: 36 hours. Marks-50 (Credit 02)

Course Outcomes: Thestudents will acquire

a) knowledge of important univariate distributions such as Laplace, Cauchy, Lognormal, Weibull, Logistic, Pareto, Power Series Distribution.

b) knowledge of Multinomial and Bivariate Normal Distribution.

c) knowledge of Truncated Distributions.

d) information of various measures of these probability distributions.

e) acumen to apply standard continuous probability distributions todifferent situations.

Unit-1: Univariate and Multivariate Probability Distributions   **(18 hours)**

1.1:Laplace (Double Exponential) Distribution: Probability density function (p.d.f.) with parameters (μ, λ), Nature of the probability curve, Distribution function, quartiles, moment generating function, mean, variance, moments, β_1, β_2, γ_1 and γ_2 coefficients. Laplace distribution is a distribution of the difference of two i. i. d. exponential variates with parameter θ, examples and problems.

1.2 :Lognormal Distribution: Probability density function (p.d.f.) withparameters(μ, σ^2), nature of the probability curve, mean, variance, median, mode, moments, β_1, β_2, γ_1 and γ_2 coefficients, Relation with $N(\mu, \sigma^2)$, examples and problems.

1.3:Cauchy Distribution: Probability density function (p.d.f.)with parameters (μ, λ), nature of the probability curve, distribution function, quartiles, non-existence of moments, additive property for two independent Cauchy variates (statement only), statement of distribution of the sample mean, relationship with uniform and Students'-tdistribution, distribution of X/Y where X and Y are i. i. d. N(0, 1), examples and problems.

1.4: Weibull Distribution: Probability density function (p.d.f.)with parameters (α, β), distribution function, quartiles, mean and variance, coefficient of variation, relation with gamma and exponential distribution, examples and problems.

1.5: Logistic distribution: Probability density function (p.d.f.)with parameters (μ, σ), distribution function,mean, mode, variance, skewness using mode, applications.

1.6: Pareto distribution: Probability density function (p.d.f.)with parameters(α, β), mean, variance, mode, skewness using mode, applications.

1.7:Power series distribution: Probability mass function (p.m.f.)mean, mode, variance, Binomial, Poisson, Geometric and Negative Binomial distribution as particular case of power series distribution.

1.8: Multinomial distribution: Probability mass function (p.m.f.), moment generating function, marginal distribution, mean, variance, covariance, variance and covariance matrix, correlation coefficient, additive property, Trinomial distribution as particular case of multinomialdistribution.

Unit-2: Truncated Distributions and Bivariate Normal Distribution:(18 hours)

2.1: Truncated distribution as conditional distribution, truncation to the right, left and on both sides. Binomial distribution B(n, p) left truncated at X = 0 (value zero not observable): Probability mass function (p.m.f), mean, variance. Poisson distribution P(λ), left truncated at X = 0 (value zero not observable): p.m.f., mean and variance. Normal distribution N(μ, σ^2) truncated (i) to the left below *a*, (ii) to the right above *b*, (iii) to the left below *a*, and to the right above *b*, its Probability density function (p.d.f.)and mean. Exponential distribution with parameter θ left truncated below *a*:Probability density function (p.d.f.), mean and variance. Examples and problems on above distributions.

2.2:Bivariate Normal Distribution: Probability density function (p.d.f.) of $BN\left(\mu_{1,}\, \mu_2, \sigma_1^2, \sigma_2^2, \rho\right)$, marginal and conditional distributions, identification of parameters, conditional expectation and conditional variance, regression of Y on X and of Xon Y., independence and uncorrelated-ness imply each other, m. g. f and moments. Distribution of aX + bY + c, where a, b and c are real numbers. Cauchy distribution as the distribution of Z = X/Y where (X, Y) $\sim BN(0, 0, \sigma_1^2, \sigma_2^2, \rho)$. Examples and problems.

Books Recommended:

1. Cramer H.: Mathematical Methods of Statistics, Asia Publishing House, Mumbai.

2. Mood, A. M., Graybill K, Bose. D. C.: Introduction to Theory of Statistics. (Third edition) Mc-GrawHiil Series.

3. Lindgren B. W.: Statistical Theory (Third Edition), Collier Macmillan International Edition, Macmillan Publishing Co. Inc. New York.

4. Hogg, R. V. and Craig A. T. : Introduction to Mathematical Statistics (Third   Edition), Macmillan Publishing Company, Inc. 866, 34d Avenue, New York, 10022.

5. Sanjay Arora and BansiLal : New Mathematical Statistics (First Edition), Satya Prakashan, 16/17698, New Market, New Delhi, 5 (1989).

6. Gupta S. C and Kapoor V. K. : Fundamentals of Mathematical Statistics, Sultan Chand and Sons, 88, Daryaganj, New Delhi 2.

7. Rohatgi V. K.: An Introduction to Probability Theory and Mathematical Statistics, Wiley Eastern Ltd., New Delhi.

8. Feller. W. : An Introduction of Probability Theory and its Applications, Wiley Eastern Ltd.. Mumbai.

9. Jhonson and Kotz: Continuous Univariate Distributions I and II

: Discrete Distributions

: Multivariate Distributions

10. Bhat B. R.: Modern Probability Theory. New Age International.

B. Sc. Part-III Semester V

SUBJECT – STATISTICS - X

DSE-E14: Statistical Inference-I

Theory: 36 hours. Marks-50 (Credit 02)

Course Outcomes: The students will acquire

a) knowledge about important inferential aspect of point estimation.

b) concept of random sample from a distribution, sampling distribution of a statistic, standard error of important estimates such as mean and proportions.

c) knowledge of various important properties of estimator,

d) knowledge about inference of parameters of standard discrete and continuous distributions.

e) concept of Fisher information and CR inequality.

f) knowledge of different methods of estimation.

Unit 1: Point Estimation: (18 hours)

1.1: Introduction: Notion of a parameter, parameter space, general problem of estimation, estimating an unknown parameter by point and interval estimation.

1.2: Point estimation: Definition of an estimator (Statistic) and its Standard Error, distinction between estimator and estimate.

1.3: Properties of estimator:

1.3.1: Unbiased estimator, biased estimator, positive and negative bias, examples of unbiased and biased estimator, Proof of the results:

a)Two distinct unbiased estimators of $\Psi(\theta)$ give rise to infinitely many unbiased estimators of $\Psi(\theta)$.

b)If T is an unbiased estimator of θ then $\Psi(T)$ is an unbiased estimator of $\Psi(\theta)$ provided $\Psi(.)$ is a linear function.

Sample variance is a biased estimator of the population variance. Illustrations of anunbiased estimators for parameter and parametric functions.Examples.

1.3.2: Relative efficiency of T_1 with respect to T_2, where T_1 and T_2 are unbiased estimators. Use of mean square error (MSE) to modify the above definition for biased estimators. Minimum Variance Unbiased Estimator (MVUE) and Uniformly Minimum Variance Unbiased Estimator (UMVUE), Uniqueness of UMVUE whenever it exists. Examples.

1.3.3: Consistency: Definition, Proof of the results:

a)Sufficient condition for consistency,

b)If T is consistent for θ and Ψ (.) is a continuous function, then Ψ (T) is consistent for Ψ (θ).

Likelihood function: Definition of likelihood function as a function of the parameter θ based on a random sample from discrete and continuous distributions.

1.3.4:Sufficiency: Concept of sufficiency, Definition of sufficient statistic through conditional distribution of the sample given the statistics. Neyman factorization criterion, Pitmann-Koopman form which admits sufficient statistic. Properties of sufficient statistic:

a)If T is sufficient for θ then Ψ (T) is also sufficient for θ provided Ψ (.) is a one-to-one function.

b)If T is a sufficient for θ then T is sufficient for Ψ (θ).

Examples.

Unit 2. Cramer Rao Inequality and Methods of estimation: **(18 hours)**

2.1: Fisher Information function: Definition of Information function, amount of information contained in a sample, Statement regarding equality of the information in $(x_1, x_2, \ldots, x_n)$ and in a sufficient statistic T, concept of minimal sufficient statistic with illustrations to exponential family. Examples.

2.2: Cramer Rao Inequality: Statement and proof of Cramer Rao Inequality. Definition of Minimum Variance Bound Unbiased Estimator (MVBUE) of $\Psi(\theta)$. Proof of the following results:

   a) If MVBUE exists for θ then MVBUE exists for $\Psi(\theta)$, if $\Psi(.)$ is a linear function.

   b) If T is MVBUE for θ then T is sufficient for θ. Examples.

2.3: Methods of Estimation:

2.3.1: Method of Maximum Likelihood: Definition, Derivation of Maximum Likelihood Estimators (MLE) for parameters of standard distributions. Properties of MLE:

   a) Invariance property (With Proof),

   b) MLE is a function of sufficient statistics,

   c) Non-uniqueness property of MLE (With counter examples).

   d) MLE's are asymptotically normally distributed. (Without Proof)

2.3.2: Method of Moments: Derivation of moment estimators for standard distributions. Illustrations of situations where MLE and moment estimators are distinct and their comparison using mean square error (for uniform distribution).

Books Recommended:

1. Kale B. K. : A first course in Parametric Inference
2. Rohatgi V. K.: Statistical Inference
3. Rohatgi V. K. : An introduction to Probability Theory and Mathematical Statistics
4. Saxena H. C. and Surendreran: Statistical Inference
5. Lehmann E. L.: Theory of Point Estimation
6. Dudewicz C. J. and Mishtra S. N. : Modern Mathematical Statistcs
7. Cassela G. and Berger R. L. Statistical Inference
8. Dixit P. G. Patil S.M. Prayag V. R. and Sunde N. J.: Inference: Theory of Estimation.
9. A. Santhakumaran: Fundamentals of Testing of Statistical Hypothesis
10. Manojkumar Srivastava, Namita Srivastava: Statistical Inference

B. Sc. Part-III Semester V
SUBJECT – STATISTICS - XI
DSE-E15: Design of Experiments
Theory: 36 hours. Marks-50 (Credit 02)

Course Outcomes: The students will acquire

a) knowledge of basic terms used in design of experiments.

b) concept of one-way and two-way analysis of variance.

c) knowledge of various designs of experiments such as CRD, RBD, LSD and factorial experiments.

d) knowledge of using an appropriate experimental design to analyze the experimental data.

Unit 1: Simple Designs of Experiments: **(18 hours)**

1.1: Basic Concepts:

i) Basic terms in design of experiments: Experimental unit, treatment, layout of an experiment.

ii)Basic principles of design of experiments: Replication, randomization and local control.

iii) Choice of size and shape of a plot for uniformity trials, the empirical formula for the variance per unit area of plots.

1.2: Completely Randomized Design (CRD):

i) Application of the principles of design of experiments in CRD, layout, mathematical model assumptions and interpretations.

ii) Estimation of parameters, Standard Error(SE), estimate of σ as square root of Mean Error Sum of Square. Expected values of mean sum of squares, components of variance.

iii) Breakup of total sum of squares into components.

iv) Visual inspection of treatment effects using treatment wise BOX-PLOT's.

v)Technique of one-way analysis of variance (ANOVA) and its applications to CRD.

vi) Statement of Chochran's theorem (without proof) for justification of F-test. Tests for equality for treatment effects and its interpretation. Test for equality of two specified treatment effects using Critical Difference(CD)

vii)Model adequacy check using residual analysis.

1.3: Randomized Block Design (RBD):

i)Application of the principles of design of experiments in RBD layout, model, assumptions and interpretations.

ii)Estimation of parameters, expected values of mean sum of squares, components of variance.

iii)Breakup of total sum of squares into components.

iv)Visual inspection of treatment effects, block effects using BOX-PLOT's.

v)Technique of Two way analysis of variance (ANOVA) and its applications to RBD. Residual analysis for model adequacy checking.

vi)Related testing procedures and their interpretations, test for equality of two specified treatment effects, comparison of treatment effects using critical difference (C.D.).

vii)Idea of missing plot technique.

viii)Situations where missing plot technique is applicable.

ix)Analysis of RBD with single missing observation.

1.4: Latin Square Design (LSD):

i)Application of the principles of design of experiments in LSD layout model, assumptions and interpretations.

ii)Breakup of total sum of squares into components.

iii)Estimation of parameters, Standard Error(SE), expected values of mean sum ofsquares, components of variance. Preparation of analysis of variance (ANOVA) table.

iv)Visual inspection of treatment effects, row and column effects using BOX-PLOT's.

v)Related tests and their interpretations, test for equality of two specified treatment effects,comparison of treatment effects using critical difference (C.D.).Residual analysis for model adequacy checking.

vi)Analysis of LSD with single missing observation.

vii)Identification of real life situations where CRD, RBD and LSD are used.

Unit 2: Analysis of Non-Normal Data, Efficiency and Factorial Experiments:(18 hours)

    2.1: Analysis of non- normal data in CRD, RBD, LSD using

  i)Square root transformation for counts.

  ii)Sin^{-1} (.) transformation for proportions.

  iii)Kruskal Wallis test.

    2.2: Efficiency of design:

  i)Concept and definition of efficiency of a design.

  ii)Efficiency of RBD over CRD.

  iii)Efficiency of LSD over CRD and LSD over RBD.

    2.3: Factorial Experiments:

i)General description of factorial experiments, 2^2& 2^3 factorial experiments arranged in RBD.

ii)Definitions of main effects and interaction effects in 2^2 and 2^3 factorial experiments.

iii)Model assumptions and its interpretation.

iv)Preparations of ANOVA table by Yate's procedure, test for main effects and interactioneffects.

v)General idea and purpose of confounding in factorial experiments.

vi)Total confounding (Confounding only one interaction): ANOVA table, testing main effects andinteraction effects.

vii)Partial Confounding(Confounding only one interaction per replicate): ANOVA table. Testing main effects and interaction effects.

viii)Construction of layout in total confounding and partial confounding in 2^3 factorial experiment.

Books Recommended:

1. Montgomery, D.C. (2001): Design and Analysis of Experiments, John Wiley and sons Inc., New Delhi.

2. Dass, M.N. and Giri,N.C. (1986) Design and Analysis of Experiments, II Edition Wiley Eastern Ltd., New Delhi

3. Snedecor, G.W. and Cochran, W.G. (1994). Statistical Methods, 8th edition, Affiliated East – West Press, New Delhi

4. Goon, A.M., Gupta,M.K. and Dasgupta, B. (1998). Fundamentals of Statistics, Vol.II, The world Press Pvt. Ltd. Kolkatta.

5. Gupta S.C. and Kapoor V.K.(2006). Fundamentals of Applied Statistics, S.Chand Sons, New Delhi

6. Wu, C.F.J. and Hamda, M. (2009). Experiments, Planning, Analysis and Parameter Design Optimization, John Wiley & Sons,Inc.,Hoboken,New Jersey.

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B. Sc. Part-III Semester V

SUBJECT – STATISTICS - XII

DSE-E16: R-Programming and Quality Management

Theory: 36 hours. Marks-50 (Credit 02)

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Course outcomes: The students will acquire

    a) importance of R- programming

    b) knowledge of identifiers and operators used in R.

    c) knowledge of conditional statements and Loops used in R.

    d) knowledge of quality tools used in Quality management.

e) knowledge of process and product control used in Quality management.

Unit-1: R Programming: (18 hours)

1.1: Introduction: History,Feathersof R**,** Character sets,

Identifiers: Variable, Constants, Symbolic constant, key words, Data Types and Data Structure,

Operators: Arithmetic, relational, logical, assignment, increasing, decreasing, special operators, Character vectors, Input and output functions, Data Import and Export function, Basic built-in function

1.2: Programming: Algorithm, flow chart, Structure of programme,

Conditional Statements: If, if else, **Loops:** for, while, Unconditional Statements, Writing of your own functions, Diagrams and Graphs, Simple programmes on

1) Finding Area of circle.

2) To check whether the given integer is positive or negative.

3) Reverse a given number.

4) To find greatest of three numbers.

5) Find Prime numbers in a given range.

6) To check if number is odd or even.

7) To check leap year.

8) To find sum of first n natural numbers.

9) To find AM, GM, and HM for ungrouped data.

10) To find Mean deviation, Variance, Standard deviation for ungroupeddata.

11) To generate random numbers from discrete distributions.

12) To generate random numbers from continuous distributions.

Unit-2: Quality Management:(18 hours)

2.1:Quality Tools: Meaning and dimensions of quality, quality philosophy, Magnificenttools of quality: Histogram, Check sheet, Pareto diagram, cause and effect diagram, scatter diagram, control chart, flow chart. Deming's PDCA cycle.

2.2:Process Control: CUSUM chart, tabular form, use of these charts for monitoring process mean. Moving average and exponentially weighted moving average charts. Introduction to six-sigma methodology, DMAIC cycle and case studies.

2.3:Product Control: Sampling Inspection plans for attribute: Concept of AQL, LTPD,Consumer's risk, producer's risk, AOQ, AOQL, OC, ASN and ATI. Description of Single and double sampling plans with determination of above constants.

Books Recommended:

1. Crawley, M. J. (2006): Statistics - An introduction using R. John Wiley, London 32

2. Purohit, S.G.; Gore, S.D. and Deshmukh, S.R. (2015): Statistics using R, second edition. Narosa Publishing House, New Delhi.

3. Shahababa, B. (2011): Biostatistics with R, Springer, New York

4. Verzani, J. (2005): Using R for Introductory Statistics, Chapman and Hall /CRC Press, New York

5. Montgomery D. C.: Introduction to quality Control

6. Duncan A. J.:Quality Control and Industrial statistics

7. GrantE. . L: Statistical Quality Control

B. Sc. Part-III Semester VI
SUBJECT – STATISTICS - XIII
DSE-F13: Probability Theory and Applications
Theory: 36 hours. Marks-50 (Credit 02)

Course Outcomes: The students will acquire

a) knowledge about order statistics and associated distributions

b) concept of convergence and Chebychev'sinequality and its uses

c) concept of law large numbers and central limit theorem and its uses.

d) knowledge of terms involved in reliability theory as well as concepts and measures.

Unit-1: Order Statistics and Convergence: **(18 hours)**

1.1: Order Statistics: Order statistics for a random sample of size n from a continuous distribution, Joint distribution, definition, derivation of distribution function and density function of the ith order statistic, particular cases for i=1 and i= n, Derivation of joint p. d. f. of ith and j^{th} order statistics , statement of distribution of the sample range, Distribution of the sample median when n is odd. Examples and problems.

1.2: Convergence and Limit Theorem: Convergence -Definition of convergence of sequence of random variables (a) in probability, (b) in distribution, (c) in quadratic mean. If $X_n \xrightarrow{P} X$ then $g(X_n) \xrightarrow{P} g(X)$ where g is continuous function without proof. Examples and problems.

1.3: Chebychev's Inequality: Chebycheve's inequality for discrete and continuous distributions.Examples.

1.4: Weak Law of Large Numbers and Central Limit Theorem: Weak law of large numbers (WLLN)- statement and proof for i. i. d. random variables with finite variance.

1.5 Central Limit Theorem: Statement and proof for i.i.d. random variables with finite variance, proof based on m. g. f.., simple examples based on Bernoulli, binomial, Poisson and chi-square distribution.

Unit-2: Reliability Theory: **(18 hours)**

2.1:Binary System: Block diagrams, definition of binary coherent structure and illustrations. Coherent system of components at most three, (a) Series, (b) Parallel, (c) 2 out of 3: Minimal cut, minimal path representation of system.

2.2:Reliability of binary System: Reliability of systems h(p), when components are independent and identically distributed with common probability p of operating.

2.3:Ageing Properties: Definitions of hazard rate, hazard function, survival function. Concept ofdistributions with increasing and decreasing failure rate (IFR, DFR). Relationship betweensurvival function and hazard function, density function and hazard rate. Derivations of results: (1) Hazard rate of a series system of components having independent life times is summation of component hazard rates.(2) Life time of series system of independent components with independent IFR life times is IFR,

2.4: Examples on exponential distribution.

Books Recommended :

1. Barlow R. E. and Proschan Frank: Statistical Theory of Reliability and Life Testing. Holt Rinebartand Winston Inc., New Yark.

2. Cramer H.: Mathematical Methods of Statistics, Asia Publishing House, Mumbai.

3. Lindgren B. W.: Statistical Theory (Third Edition), Collier Macmillan   International Edition, Macmillan Publishing Co. Inc. New York. .. .

4. Hogg, R. V. and Craig A. T. : Introduction to Mathematical Statistics (Third Edition), Macmillan Publishing Company, Inc. 866, 34d Avenue, New York, 10022.

5. Sanjay Arora and BansiLal : New Mathematical Statistics (First Edition), Satya Prakashan, 16/17698, New Market, New Delhi, 5 (1989).

6. Gupta S. C and Kapoor V. K. : Fundamentals of Mathematical Statistics, Sultan Chand and Sons, 88, Daryaganj, New Delhi 2.

7. Rohatgi V. K.: An Introduction to Probability Theory and Mathematical Statistics, Wiley Eastern Ltd., New Delhi.

8. Hoel, Port and Stone: Introduction to Stochastic Processes, Houghton Mifflin.

9. Feller. W. : An Introduction of Probability Theory and its Applications. Wiley Eastern Ltd.. Mumbai.

10. Bhat B. R.: Modern Probability Theory.

11 Ross S: Probability Theory.

12. Sinha S. K. : Reliability and Life Testing, Second Edition, Wiley Eastern Publishers, New Delhi.

13.Trivedi R. S. : Probability and Statistics with Reliability and Computer Science Application, Prentice – Hall of India Pvt. Ltd., New Delhi.

14. ParimalMukhopadhyaya: An Introduction to the Theory of Probability. World Scientific Publishing.

B. Sc. Part-III Semester VI
SUBJECT – STATISTICS - XIV
DSE-F14: Statistical Inference-II
Theory: 36 hours. Marks-50 (Credit 02)

Course Outcomes: The students will acquire

 a) concept of interval estimation.

 b) knowledge of interval estimation of mean, variance and population proportion.

 c) knowledge of important aspect of test of hypothesis and associated concept.

 d) concept about parametric and non-parametric methods.

 e) Knowledge of some important parametric as well as non–parametric tests.

Unit 1: Interval Estimation and Parametric Tests: (18 hours)

 1.1: Interval Estimation:

 1.1.1: Notion of interval estimation, Definition of confidence interval, length of confidence interval, confidence bounds. Definition of pivotal quantity and its use in obtaining confidence intervals and bounds.

 1.1.2: Interval estimation for the following cases:

 i) Mean μ of normal distribution (σ known and unknown)

 ii) Variance σ^2 of normal distribution (μ known and unknown)

 iii) Difference between two means ($\mu_1 - \mu_2$)

     a. For a sample from bi-variate normal population

     b. For samples from two independent normal populations.

iv)Ratio of variances for samples from two independent normal populations.

v)Mean of exponential distribution

vi)Population proportion and difference of two population proportions

vii)Population median (using order statistics and limiting distribution of median).

1.2: Parametric tests:

1.2.1: Statistical hypothesis, problems of testing of hypothesis, definitions and illustrations of (i) simple hypothesis (ii) composite hypothesis, critical region, Type I and Type II error, probabilities of type I and Type II errors. Power of a test, p-value, size of a test, level of significance, problem of controlling probabilities of type I and Type II errors.

1.2.2: Definition of Most Powerful (MP) test. Statement and proof (sufficient part) of Neyman- Pearson (NP) lemma for simple null hypothesis against simple alternative hypothesis for construction of MP test. Examples of construction of MP test of level α.

1.2.3: Power function of a test, power curve, definition of Uniformly Most Powerful (UMP)level α test, Use of NP lemma for constructing UMP level α test for one-sided alternative. Computation of powers for standard probability distributions.

1.2.4:Likelihood Ratio (LR) Test: Procedure of LR test, statement of its properties, LR test involving mean and variance of normal population for two sided alternative hypothesis only.(i.e. H_o: $\mu = \mu_o$ v/s $H_1 : \mu \neq \mu_0$ and H_o: $\sigma^2 = \sigma_0^2$ v/s $H_1 : \sigma^2 \neq \sigma_0^2$)

Unit 2. SPRT and Non-parametric Tests: **(18 hours)**

2.1: Sequential Test: General theory of sequential analysis and its comparison with fixed sample procedure. Wald's SPRT of strength (α, β) for simple null hypothesis against simple alternative hypothesis. Illustrations for binomial, Poisson, exponential and normal distributions, Graphical and tabular procedure for carring out the test.

2.2: Non-parametric tests: Notion of non-parametric statistical inference (test) and its comparison with parametric statistical inference. Concept of distribution free statistic. Test procedure of:

i) Run test for randomness and run test for equality of distributions.

ii) Sign test for one sample and two sample paired observations

iii)Wilcoxson's signed rank test for one sample and two samples pairedobservations

iv)Mann-Whitney U-test (Two independent samples)

v) Median test

vi) Kolmogorov Smirnov test for one and two independent samples.

Books Recommended:

1. Kale B. K. : A first course in Parametric Inference
2. Rohatgi V. K.: Statistical Inference
3. Rohatgi V. K. : An introduction to Probability Theory and Mathematical   Statistics
4. Saxena H. C. and Surendreran: Statistical Inference
5. Lehmann E. L.: Theory of Point Estimation
6. Dudewicz C. J. and Mishtra S. N. : Modern Mathematical Statistcs
7. Cassela G. and Berger R. L. Statistical Inference
8. Gibbons J. D.: Non-parametric Statistical Inference
9. Doniel : Applied Non-parametric Statistics
10. Siegel S.: Non-parametric Methods for the behavioral sciences.
11. Kunte S, Purohit S. G and Wanjale S.K: Lecture notes on Non-parametric Tests.
12. Dixit P. G. Patil S.M. Prayag V. R. and Sunbandh N. J.: Inference: Theory of Estimation.
13. Bhuyan K. C.: Probability Distribution Theory and Statistical Inference
14. A. Santhakumaran: Fundamentals of Testing of Statistical Hypothesis
15. Manojkumar Srivastava, Namita Srivastava: Statistical Inference

B. Sc. Part-III Semester V
SUBJECT – STATISTICS - IX
DSE-F15: Sampling Theory
Theory: 36 hours. Marks-50 (Credit 02)

Course Outcomes: The students shall get

    a) basic knowledge of complete enumeration and sample, sampling frame sampling distribution, sampling and non-sampling errors, principle steps in sample surveys, sample size determination, limitations of sampling etc.

    b) concept of various sampling methods such as simple random sampling, stratified random sampling, systematic sampling and cluster sampling.

    c) an idea of conducting sample surveys and selecting appropriate sampling techniques.

    d) knowledge of comparing various sampling techniques.

    e) knowledge of ratio and regression estimators.

Unit- 1: Simple and Stratified Random Sampling: **(18 hours)**

      1.1: Simple Random Sampling:

i) Revision of Simple random sampling, Procedure of drawing SRSWOR and SRSWR using (a) random number table (b) software.

ii) Sample mean ($\bar{y}$) as an estimator of population mean, derivation of its expectation, standard error and estimator of standard error under SRSWOR and SRSWR

iii)N$\bar{y}$ as an estimator of population total, derivation of its expectation, standard error and estimator of standard error under SRSWOR and SRSWR

iv) Sampling of dichotomous attributes. Estimation of population proportion, Sample proportion (p) as an estimator of population proportion (P), derivation of its expectation, standard error using (SRSWOR). Np as an estimator of total number of units in the population possessing the attribute of interest, derivation of its expectation, standard error and estimator of standard error.

1.2: Determination of the sample size:

Determination of the sample size (n) under SRSWOR for variables and attributes given

i) Margin of error and confidence coefficient.

ii)Coefficient of variation of the estimator and confidence coefficient.

1.3: Stratified Sampling:

i)Real life situations where stratification is appropriate.

ii)Procedure of drawing stratified sample using (a) random number table (b) softwaregiven the sampling frame.

iii)Description of stratified sampling method where sample is drawn from individualstratum using SRSWOR method.

(a) $\bar{y}_{st}$ as an estimator of population mean $\bar{Y}$, derivation of its expectation, standard error and estimator of standard error.

(b) N$\bar{y}$ as an estimator of population total, derivation of its expectation, standard error and estimator of standard error.

iv)Problem of allocation: Proportional allocation, Neyman's allocation and optimumallocation, derivation of the expressions for the standard errors of the above estimators when these allocations are used.

v)Comparison amongst SRSWOR, stratification with proportional allocation and stratification with optimum allocation. Gain in precision due to stratification.

vi)Cost and variance analysis in stratified random sampling, minimization of variance for fixed cost, minimization of cost for fixed variance, optimum allocation as a particular case of optimization in cost and variance analysis.

Unit2: Other Sampling Methods: (18 hours)

2.1: Systematic Sampling:

i)Real life situations where systematic sampling is appropriate. Techniques of drawing a sample using systematic sampling (when the population size is multiple of sample size).

ii) Estimation of the population mean and population total, standard error of these estimators.

iii) Comparison of systematic sampling with SRSWOR.

iv)Comparison of systematic sampling with SRSWOR and stratified sampling in the presence of linear trend.

v)Idea of Circular Systematic Sampling.

2.2: Cluster Sampling:

i) Real life situations where cluster sampling is appropriate. Techniques of drawing asample using cluster sampling.

ii)Estimation of the population mean and population total (with equal size clusters), standard error of these estimators.

iii)Systematic sampling as a particular case of cluster sampling.

2.3:Two-stage and Multi-stage sampling:Idea of two stage and multistage sampling

2.4: Ratio Method:

i)Concept and rationale of auxiliary variable and its use in estimation

ii)Situations where Ratio method is appropriate.

iii)Ratio estimators of the population mean and population total and their standard errors (without derivations), estimators of these standard errors.

iv) Relative efficiency of ratio estimators with that of SRSWOR.

2.5: Regression Method:

i) Situations where Regression method is appropriate.

ii)Regression estimators of the population mean and population total and their standard errors (without derivations), estimators of these standard errors.

iii)Comments regarding bias in estimation.

iv)Relative efficiency of regression estimators with that ofa) SRSWOR   b) Ratio estimator.

2.6: Case Study: Study of surveys illustrating the above ideas. Rounds conducted by NSSO**.**

Books Recommended:

1. Cochran, W.G: Sampling Techniques, Wiley Eastern Ltd., New Delhi.

2. Sukhatme, P.V. and Sukhatme, B.V. : Sampling Theory of Surveys with Applications, IndianSociety of Agricultural Statistics, New Delhi.

3. Des Raj : Sampling Theory.

4. Daroga Singh and Choudhary F.S.; Theory and Analysis of Sample Survey Designs, Wiley EasternLtd., New Delhi.

5. Murthy, M.N: Sampling Methods, Indian Statistical Institute, Kolkata.

6. ParimalMukhopadhyay (2008):Sampling theory and methods of survey sampling, Prentice Hall of India.

B. Sc. Part-III Semester V
SUBJECT – STATISTICS - XVI
DSE-F16: Operations Research
Theory: 36 hours. Marks-50 (Credit 02)

Course Outcomes: The students will acquire

a) Concept of Linear programming problem.

b) Knowledge of solving LPP by graphical and Simplex method.

c) Knowledge of Transportation, Assignment and Sequencing problems.

d) Concept of queuing theory.

e) Knowledge of simulation technique and Monte Carlo technique of simulation.

Unit-1: (18 hours)

1.1: Linear programming: Basic concepts, Statement of the Linear Programming Problem (LPP), formulation of problem as L.P. problem. Definition of (i) a slack variable, (ii) a surplus variable, L.P. problem in (i) canonical form, (ii) standard form. Definition of (i) a solution, (ii) a feasible solution, (iii) basic variable and non-basic variable, (iv) a basic feasible solution, (v) a degenerate and a non-generate solution, (vi) an optimal solution,   Solution of L.P.P.: i. Graphical Method: Solution space, obtaining an optimal solution, unique and non- unique optimal solutions, ii. Simplex Method: (a) Initial basic feasible solution (IBFS) is readily available: obtaining an

IBFS, criteria for deciding whether obtained solution is optimal, criteria for unbounded solution, more than one optimal solutions (b) IBFS not readily available: introduction of artificial variable, Big-M method, modified objective function, modifications and applications of simplex method to L.P.P., criterion for no solution, Duality Theory: Writing dual of a primal problem, solution of L.P.P. with artificial variable, Examples and problems.

1.2: Transportation, Assignment and Sequencing Problems:

Transportation problem(T.P.): statement, balanced and unbalance T. P., Methods of obtaining initial basic feasible solution of T.P. (a) North West corner rule (b)Method of matrix minima (least cost method), (c) Vogel's approximation(VAM)., MODI method of obtaining Optimal solution of T. P, uniqueness and non- uniqueness of optimal solutions, degenerate solution, examples and problems.

Assignment Problem: Statement, balanced and   unbalanced   assignment problem, relationwith T.P, optimal solution of an assignment problem using Hungarian method, examples and problems.

Sequencing Problem: Introduction, Statement of problem, Procedure of processing n jobs on two machines, Procedure of processing n jobs on three machines and m machines. Computations of elapsed time and idle times, examples and problems.

Unit-2:   **(18 hours)**

2.1: Queuing Theory: Introduction, essential features of queuing system, input source, queue configuration, queue discipline, service mechanism, Operating characteristics of queuing system, transient- state and steady state, queue length, general relationship among system characteristics.

Probability distribution in queuing system: Distribution of arrival, distribution of inter arrival time, distribution of departure and distribution of service time (Derivations are not expected), Types of queuing models, Solution of queuing Model: M/M/1, using FCFS queue discipline. Examplesandproblems.

2.2: Simulation Techniques: Meaning of simulation, Monte Carlo simulation, advantages and disadvantages of simulation, definition and properties of random numbers, generation of pseudo random numbers, Techniques of generating random numbers from uniform distribution, Tests for randomness and uniformity distribution, random variate generation using inverse cdf method, random variate generation from Bernoulli, Binomial, Poisson, Geometric, Exponential and normal distributions.

Book Recommended:

1. Gass E.: Linear Programming Method and Applications, Narosa Publishing House, New Delhi.

2. Shrinath L. S.: Linear Programming.

3. Taha H. A.: Operation research – An Introduction, Fifth Edition, Prentice Hall of India, New Delhi.

4. Saceini, Yaspan, Friedman: Operations Research Method and Problems, Wiley International Edition.

5. Shrinath, L. S.: Linear Programming, Affiliated East-West Press Pvt. Ltd., New Delhi.

6. Phillips, D. T., Ravindra, A., Solberg, J.: Operations Research Principles and Practice, John Wiley and Sons Inc.

7. Sharma, J. K.: Mathematical Models in Operations Research, Tau McGraw Hill Publishing Company Ltd., New Delhi.

8. Kapoor, V. K.; Operations Research, Sultan Chand and Sons, New Delhi.

9. Gupta, P. K. and Hira, D. S.: Operations Research, S. Chand and Company Ltd., New Delhi.

10. Luc Devroye: Non-Uniform Random Variate Generation, Springer – Verlag, New York.

11. Gentle, J. E.: Random Number Generation and Monte Carlo Methods, Springer- Verlag.

12. Robert, C. P. and Casella, G.: Monte Carlo Statistical methods, Springer-Verlag.

13. Rubinstien, R. Y.: Simulation and Monte Carlo Method, John Wiley, New York.

B.Sc. III (Statistics)

Practical IV

Probability Distributions

1. Model sampling from Laplace and Cauchy distributions.

2. Model sampling from log-normal and Weibull distributions.

3. Model sampling from logistic distribution.

4. Model sampling from Pareto distribution.

5. Model sampling from truncated binomial and Poisson distributions.

6. Model sampling from truncated normal and exponential distributions.

7. Model sampling from bivariate normal distribution.

8. Fitting of log-normal distribution.

9. Fitting of Weibull distribution.

10. Fitting of logistic distribution.

11. Fitting of Pareto distribution.

12. Fitting of truncated binomial distribution.

13. Fitting of truncated Poisson distribution.

14. Applications of multinomial distribution.

15. Applications of bivariate normal distribution.

Practical-V

Statistical Inference

1. Point estimation by Method of Moment for Discrete Distributions.

2. Point estimation by Method of Moment for Continuous Distributions.

3. Point estimation by Method of Maximum Likelihood (for one parameters).

4. Point estimation by Method of Maximum Likelihood (for two parameters).

5. Interval estimation of location and scale parameters of normal distribution(Single Sample).

6. Interval estimation of difference of location and ratio of scale parameters of normal distributions(Two sample).

7. Interval estimation for population proportion and difference between two population proportions.

8. Interval estimation for population median (using order statistics and limiting distribution of median).

9. Construction of MP test.

10. Construction of UMP test.

11. Construction of SPRT for Binomial, Poisson distributions, graphical representation of procedure.

12. Construction of SPRT for exponential and normal distributions, graphical representation of procedure.

13. Non-Parametric Tests-I : Run test, Sign test and Wilcoxon signed Rank test

14. Non-Parametric Test-II : Mann-Whitney U-test for two independent samples and Median Test for two large independent samples

15. Non-Parametric Tests-III: Kolmogorov-Smirnov test for one and two independent samples.

Practical VI

Design of Experiments and Sampling Methods

1. Analysis of CRD and RBD, Efficiency of RBD over CRD.

2. Analysis of LSD and efficiency of LSD over CRD and RBD.

3. Missing plot technique for RBD and LSD with single missing observations.

4. Analysis of Variance for non-normal data. (CRD, RBD, LSD)

5. Kruskal-Walli's test for non-normal data(CRD,RBD,LSD)

6. Analysis of 2^2 and 2^3 factorial experiment.

7. Partial and total confounding

8. Simple Random Sampling for (i) Variables (ii) Attributes.

9. Determination of sample size in SRS for (i) Variables (ii)Attributes.

10. Stratified Random Sampling-I

11. Stratified Random Sampling-II

12. Ratio method of estimation

13. Regression method of estimation

14. Systematic Sampling

15. Cluster Sampling.

Practical VII

R- Programming,Quality Management andOperations Research

R- Programming:

1. Data input/output - Creation of vector using commands: c , rep , seq, scan

    - Creation of data frame using commands: data frame, edit

    - Arithmetic operation on vectors.

2. Diagrammatic and Graphical representation of data- Simple bar diagram, subdivided bar diagram, pie diagram, histogram, frequency polygon, ogive curves.

3. R- Programming (Measures of Central Tendency and Dispersion)

4. Simulation-I using R (Bernoulli, Binomial, Poisson and Geometric distribution.).

5. Simulation-II using R (Exponential and Normal distribution).

Quality Management:

6. EWMAChart.

7. CUSUM chart.

8. Six sigma limits for mean.

9. Single sampling plan.

10. Double sampling plan.

Operations Research:

11. Solution of LPP by Simplex Method

12. Solution of LLP by Big–M method.

13. Transformation problem.

14. Assignment problem.

15. Sequencing Problem.

SHIVAJI UNIVERSITY, KOLHAPUR.

Accredited By NAAC with 'A' Grade

Revised Syllabus For

B.Sc Part- III

Zoology

Syllabus to be implemented from

June, 2020 onwards.

SHIVAJI UNIVERSITY, KOLHAPUR

Revised Syllabus for Bachelor of Science

B. Sc. III – Zoology –To be implemented from June 2020

GENERAL OBJECTIVES OF THE COURSE

1) Aims:

1. To impart the knowledge of animal science to the pupils.
2. To make the pupils to use the knowledge in their daily life.
3. To make the pupils aware of natural resources and environment.
4. Application of knowledge in Zoology for nutrition, agriculture & live stock.
5. To provide practical experiences which form a part of their learning processes.
6. To develop aptitude for scientific work & ability to pursue studies far beyond graduation.
7. To encourage the pupils to take life science as a carrier which is the need now a days.
8. To make the pupils fit for the society.

2) Objectives –

1. To impart knowledge is the basic aim of education. The students are expected to acquire the knowledge of animal science, natural phenomenon, manipulation of nature & environment by man.
2. Understanding the scientific terms, concepts, facts, phenomenon & their interrelationships.
3. Applications of the knowledge.
4. To develop skills in practical work, experiments & laboratory materials, instruments.
5. To develop interests in the subject & scientific hobbies.
6. To develop scientific attitude which is the major objective? This makes the students open minded, critical observations, curiosity, thinking etc.
7. Abilities to apply scientific methods, collection of scientific data, problem solving, organize science exhibitions, clubs etc.
8. Appreciation of the subject, contributions of scientists, scientific methods, scientific programs etc.

3) DURATION

• The course shall be full time course.

• The duration of course shall be three years.

4) PATTERN: Pattern of Examination will be semester for theory and annual for practical with INTERNAL ASSESSMENT (Project/Seminar/Field work for theory) Scheme

5) MEDIUM OF INSTRUCTION: The medium of instruction shall be in English.

6) STRUCTURE OF COURSE: B.Sc. III – Zoology THEORY – No. of papers: Eight, No of practicals: Four SEMESTER V-Paper IX to XII & SEMESTER VI- Paper XIII to XVI

SEMESTER-V Theory

Sr. No.	Subject	Marks	University	Internal
1	Zoology Paper- IX	50	40	10
2	Zoology Paper- X	50	40	10
3	Zoology Paper- XI	50	40	10
4	Zoology Paper- XII	50	40	10

Total=200

SEMESTER-VI Theory

Sr. No.	Subject	Marks	University	Internal
1	Zoology Paper- XIII	50	40	10
2	Zoology Paper- XIV	50	40	10
3	Zoology Paper- XV	50	40	10
4	Zoology Paper- XVI	50	40	10

Total = 200

PRACTICALS- Annual

09	Practical—V	50
10	Practical – VI	50
11	Practical – VII	50
12	Practical – VIII	50

Total   200

Total = 600

7. SCHEME OF TEACHING AND EXAMINATION (Teaching scheme - Hrs/Week)

No	Sem. - V	Sem. - VI	L	P	Total
1	Paper No IX Paper No. XIII	Paper No IX Paper No. XIII	3		
2	Paper No IX Paper No. XIII	Paper No IX Paper No. XIII	3		
3	Paper No IX Paper No. XIII	Paper No IX Paper No. XIII	3		
4	Paper No IX Paper No. XIII	Paper No IX Paper No. XIII	3		
			12		12
1	Practical V			5	
2	Practical VI			5	
3	Practical VII			5	
4	Practical VIII			5	
				20	20
	Total				32

8) SCHEME OF EXAMINATION

Question paper will be set in the view of the / in accordance with the entire syllabus and preferably covering each unit of syllabi.

9) EQUIVALENCE IN ACCORDANCE WITH TITLES AND CONTENTS OF PAPERS (FOR REVISED SYLLABUS)

Refer copy of revised syllabus

10) OTHER FEATURES

1. Required Books, Journals stated in each syllabus of Part I, Part II and Part III Zoology and Fisheries.

A) LIBRARY : Reference and Text Books, Journals, and Periodicals, Reference Books for Advanced Studies.

B) SPECIFIC EQUIPMENTS: Necessary to run the Course (T.V., L.C.D., and Overhead Projector), (Computer and necessary software's, operating systems etc.)

C) LABORATORY SAFETY EQUIPMENTS

- Fire Extinguishers at least two sets in each laboratory. (Lab. area 600 sq.ft.)

- Leakage of gases be avoided.
- Primary medical aid box (First Aid Kit)
- Sugar / Glucose – 500 gm pack: Pinch of sugar and a cup of drinking water in hypoglycemic condition. OR In extreme weakness of student or person concerned.
- Rules of animal ethics should be strictly followed.

D) LABORATORY INSTRUCTIONS

1) Always wear an apron inside the laboratory. Do not wear it outside.

2) Do not drink or eat inside the laboratory.

3) Do not place pencil, fingers or any material in the mouth. Moisten labels with water.

4) Use microscopes and other instruments carefully.

5) Discard all used glassware such as test tube, pipettes, petry-plates, glass slides in a receptacle meant for it.

6) Put cotton plugs, papers, matches, waste dissection material etc. in a waste-paper basket. Do not throw them in sink not leave them on desk or floor.

7) Regard all cultures as pathogenic. Take every precaution against infection.

8) Report all accidents to the instructor immediately.

9) Wash hands thoroughly with soap and water before and after dissection and experiment.

10) Always turn off water, gas and electricity before leaving the laboratory.

11) When students enter in laboratory they should have – A Laboratory Journal, pencil and eraser, foot rule, dissection box with dissecting instruments, a small napkin.

12) All drawings must be made with drawing pencil only.

13) As the journal is to represent student's bonafide work during the whole year, student should keep it as clean as possible and DO NOT LOOSE IT

14) Students should not forget that unless their journals are certified, they are not allowed to appear for the university examination

11) COMMON NATURE OF QUESTION FOR THEORY

PAPER: SEMISTER – V Zoology Paper (IX, X, XI, XII)

SEMISTER – VI   Zoology Paper (XIII, XIV, XV, XVI)

Q. 1	Multiple Choice Questions (Eight questions)	08
Q. 2	Long answer questions (Attempt any two out of three)	16
	A.	
	B.	
	C.	
Q. 3	Shorn Notes (Attempt any four out of Six)	16
	a.	
	b.	
	c.	
	d.	
	e.	
	f.	

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SHIVAJI UNIVERSITY, KOLHAPUR

Syllabus of B.Sc. Part III Zoology

Zoology Paper- IX

DSE-E29 (COMPARATIVE ANATOMY OF VERTEBRATES)

Theory: 30 hrs. (37.5 lectures of 48 minutes) (Credits 2)

Unit 1: Integumentary System   4
    1. Generalized structure of integument
    2. Functions of Integument
    3. Soft and Hard epidermal derivatives
    4.Hard epidermal derivatives

Unit 2: Skeletal System   4
    1. Vertebral column
    2. Appendicular skeleton

Unit3: Digestive System   4
    Brief account of alimentary canal and digestive glands

Unit 4: Respiratory System   4
    Brief account of Gills, lungs, air sacs

Unit 5: Circulatory System   4
    Evolution of heart and aortic arches

Unit 6: Evolution of Kidney   3
    Succession of kidney

Unit 7: Nervous System   3
    Comparative account of brain

Unit 8: Sense Organs   4
    Comparative account of ear and eye of vertebrates

SUGGESTED READINGS:

1. Kardong, K.V. (2005) Vertebrates' Comparative Anatomy, Function and Evolution. IV Edition. McGraw-Hill Higher Education. Kent, G.C. and Carr R.K. (2000). Comparative Anatomy of the Vertebrates. IX Edition

2. The McGraw-Hill Companies. Hilderbrand, M and Gaslow G.E. Analysis of Vertebrate Structure, John Wiley and SonsWalter, H.E. and Sayles, L.P; Biology of Vertebrates, Khosla Publishing House.

3. Outlines of comparative anatomy, Romer & Parsons, Central Book Depot, The Vertebrate Body (Saunders).
4. Biology of Vertebrates Walter & Sayles; (McMillan).

5. Chordate Zoology, P.S. Dhami & J. K. Dhami - R. Chand & Co., New Delhi.
6. Modern Textbook of Zoology, R. L. Kotpal, Rastogi Publications, Meerut.
7. The Life of Vertebrates, 3rd Edition, 1993, J. Z. Young E. L. B.S. Oxford.
8. Chordate Zoology - E.L. Jordan, S. Chand & Co., New Delhi.
9. The Phylum Chordata - 1987, H.H. Newman, Distributor Satish Book Enterprise, Agra. 8. Comparative Anatomy of the Vertebrates G. C. Kent.

SHIVAJI UNIVERSITY, KOLHAPUR

Syllabus of B.Sc. Part III Zoology

Zoology Paper- X

DSE-F29 (Molecular Cell Biology and Animal Biotechnology)

Theory: 30 hrs. (37.5 lectures of 48 minutes) (Credits 2)

Unit 1: Molecular Biology – 7

    1) DNA Replication (Semiconservative mode)

    2) DNA Damage and Repair mechanism

    3) Regulation of gene expression- Operon concept

    4) Genetic Code:

        i) Properties of Genetic code

        ii) Codon assignment

        iii) Wobble hypothesis

Unit 2: Protein synthesis 8

    A) Transcription

    i) Process in prokaryotes and eukaryotes

    ii) RNA polymerase

    iii) Post transcriptional modification in RNA

    B) Translation in prokaryotes and eukaryotes

    i) Initiation

    ii) Elongation

    iii) Termination

Unit 3 : Molecular Techniques in Gene manipulation 15

1. Restriction enzymes: Nomenclature, detailed study of Type II.
2. Characteristics of Cloning vectors: Plasmids, Cosmids, Phagemids, Lambda Bacteriophages
3. Gene cloning: Transformation techniques by Calcium chloride method and electroporation
4. Construction of genomic and cDNA libraries
5. Southern, Northern and Western blotting
6. DNA sequencing: Sanger method
7. Polymerase Chain Reaction,
8. DNA Finger Printing
9. DNA micro array

SUGGESTED READINGS:

1. Brown, T.A. (1998). Molecular Biology Labfax II: Gene Cloning and DNA Analysis. II Edition, Academic Press, California, USA. Glick, B.R. and Pasternak, J.J. (2009).
2. Molecular Biotechnology - Principles and Applications of Recombinant DNA. IV Edition, ASM press, Washington, USA. Griffiths, A.J.F., J.H. Miller, Suzuki, D.T., Lewontin, R.C. and Gelbart, W.M. (2009).
3. An Introduction to Genetic Analysis. IX Edition. Freeman and Co., N.Y., USA. Snustad, D.P. and Simmons, M.J. (2009).
4. Principles of Genetics. V Edition, John Wiley and Sons Inc. Watson, J.D., Myers, R.M., Caudy, A. and Witkowski, J.K. (2007).
5. Recombinant DNAGenes and Genomes- A Short Course. III Edition, Freeman and Co., N.Y., USA. Beauchamp, T.I. and Childress, J.F. (2008).
6. Principles of Biomedical Ethics. VI Edition, Oxford University Press.
7. Cell and Molecular Biology, 8th Edition, De. Robertis EDP and De Robertis Jr. EMF, Lippincott Williams and Wilkins,Philadelphia.
8. Cell Biology, C.B. Powar, Himalaya Publication House.
9. Cell and Molecular Biology, EJ. Dupraw, Academic Press, NewYork.
10. Cell Structure and Function - A. G. Loewy, P. Siekevitz, J. R. Meninger & J. A. N. Gallant, Saunder College, Philadelphia.
11. Molecular Biology of the Cell - 3rd Edition, Bruce Alberts, Dennis Bray, Julian Lewis, Martin Raff, K. Roberts & James D. Watson, Garian Publishing, New York.

SHIVAJI UNIVERSITY, KOLHAPUR

Syllabus of B.Sc. Part III Zoology

Zoology Paper- XI

DSE-F30 (Biotechniques and Biostatistics)

Theory: 30 hrs. (37.5 lectures of 48 minutes) (Credits 2)

Unit I: Genetically Modified Organisms   9

1. Production of cloned and transgenic animals:
   a. Nuclear Transplantation
   b. Retroviral Method
   c. DNA microinjection
2. Applications of transgenic animals:
   a. Productions of pharmaceuticals
   b. Production of donor organs
3. Knockout mice.

Unit II: Culture Techniques and Applications   6

   a. Animal cell culture: Introduction, principle and applications
   b. Stem Cells: Introduction to stem cells
      i) Potency of stem cells: Totipotency, Pleurepotency, Multipotency, Unipotency
      ii) Sources of stem cells-Embryo, Fetal, Adult, Bone marrow

Unit III: Biostatistics   15

   a. Classification of Biological data
   b. Frequency distribution
   c. Tabulation
   d. Graphical representation of data
   e. Measures of central tendency (Mean, Median, Mode)
   f. Dispersion – Mean, deviation & standard deviation
   g. Correlation – Scattered diagram, Karl Pearson's correlation coefficient and Spearman's rank correlation coefficient.

SUGGESTED READINGS:

1. Brown, T.A. (1998). Molecular Biology Labfax II: Gene Cloning and DNA Analysis. I Edition, Academic Press, California, USA. Glick, B.R. and Pasternak, J.J. (2009). Molecular Biotechnology - Principles and

2. Applications of Recombinant DNA. IV Edition, ASM press, Washington, USA. Griffiths, A.J.F., J.H. Miller, Suzuki, D.T., Lewontin, R.C. and Gelbart, W.M. (2009)

3. An Introduction to Genetic Analysis. IX Edition. Freeman and Co., N.Y., USA. Snustad, D.P. and Simmons, M.J. (2009).

4. Principles of Genetics. V Edition, John Wileyand Sons Inc. Watson, J.D., Myers, R.M., Caudy, A. and Witkowski, J.K. (2007).

5. Recombinant DNAGenes and Genomes- A Short Course. III Edition, Freeman and Co., N.Y., USA.Beauchamp, T.I. and Childress, J.F. (2008).

6. Principles of Biomedical Ethics. VI Edition Oxford University Press.

7. Elements of Biotechnology - P. K. Gupta, Rastogi Publications.

8. Gene V & VI, 1994, Lewin B., Oxford University Press, Oxford.

9. Concept of Genes-Pearson Edition 9.Cell and Molecular Biology

Zoology Paper- XII
DSE-F31 (AQUATIC BIOLOGY)
Theory: 30 hrs. (37.5 lectures of 48 minutes) (Credits 2)

Unit 1: Aquatic Biomes   10

    a. Freshwater ecosystem (lakes, wetlands, streams and rivers),

    b. Estuaries

    c. Intertidal zones

    d. Oceanic pelagic zone

    e. Marine benthic zone

    f. Coral reefs

Unit 2: Freshwater Biology   10

1. Lakes
    a. Lake as an Ecosystem
    b. Lake Morphometry
    c. Physico-chemical characteristics
        i. Light
        ii. Temperature
        iii. Thermal Stratification
        iv. Dissolved solids
        v. Carbonates
        vi. Bicarbonates
        vii. Phosphates and Nitrates
        viii. Turbidity
        ix. Dissolved gases (Oxygen Carbon dioxide)
        x. Nutrient Cycle – (Nitrogen, Sulphur and Phosphorus)
2. Streams
    a. Different stages of stream development
    b. Physico-chemical Environment
    c. Adaptation of hill stream fishes

Unit 3: Endocrinology   10

a. Study of endocrine glands – Anatomy and histology

b. Hormones- Nature, role, regulation and disorders with reference to the following

thyroid gland, parathyroid gland, adrenal gland and islets of Langerhans

SUGGESTED READINGS:

1. Anathakrishnan : Bioresources Ecology 3rd Edition
2. Goldman : Limnology, 2nd Edition
3. dum and Barrett : Fundamentals of Ecology, 5th Edition
4. Pawlowski : Physicochemical Methods for Water and Wastewater Treatment, 1st
5. Edition Wetzel : Limnology, 3rd edition
6. Trivedi and Goyal : Chemical and biological methods for water pollution studies
7. Welch : Limnology Vols. I-II
8. Animal Physiology – Nelson (Cambridge)
9. Endocrinology – Hadely
10. General Endocrinology – Bangara and Turner (W.B. Saunders)
11. Reproductive Physiology – Nalbandov A. V.

Zoology Paper- XIII
DSE-E30 (DEVELOPMENTAL BIOLOGY OF VERTEBRATES)
Theory: 30 hrs. (37.5 lectures of 48 minutes) (Credits 2)

Unit 1 : Gametogenesis   6
1. Types of Eggs
2. Fertilization – Types and Process of Fertilization
3. Types of Cleavages

Unit 2: Early Development of Frog   6

1. Structure of mature egg and its membranes
2. Cleavage
3. Blastula and its fate map
4. Process of gastrulation
5. Types of Morphogenic Movements
6. Fate of three germinal layers
7. Neurulation
8. Metamorphosis in frog and its hormonal regulation

Unit 3: Chick Embryology   15

1. Structure of sperm
2. Structure of egg and vitellogenesis
3. Fertilization and cleavage
4. Blastula and its fate map
5. Process of gastrulation
6. Organogenesis
   a. Development of neural tube and brain up to 72 hours of incubation
   b. Development of gut up to 72 hours of incubation
   c. Development of blood and heart up to 72 hours of incubation
   d. Foetal membranes and significance

Unit 4: Late Embryonic Development   3

1. Implantation of embryo in human being
2. Placenta – Formation, types and significance

SUGGESTED READINGS:

1. An Introduction to Embryology 1981, Balinsky B.L., Saunders College,Philadelphia.
2. Developmental Biology; Patterns/Principles/Problems, 1982, Saunders J. W. Collier MacMillan, Publishers, London.
3. Developmental Biology, 1997, 3rd Edition, Gilbert S.F. Saunder Associates Inc. U.S.A.
4. Developmental Biology, 1992 3rd edition, Browder L.W. Erickson C.A. & Williams, R J. Saunders College, Publications, London.
5. A Text Book of Embryology, Dr. Puranik P. G., S. Chand & Co. 6. Developmental Biology, 1984, Browder L.W. , Saunders College Publicaions, U.S.A.
6. Development of Chick embryo, 1972, Lillie. 8. Developmental Biology, 1991, 3rd Edition, Sinaur Associates, Inc. U.S.A.Gilbert, S. F. (2006).
7. Developmental Biology, VIII Edition, Sinauer Associates, Inc.,Publishers, Sunderland, Massachusetts, USA. Balinsky, B.I. (2008).
8. An introduction to Embryology, International Thomson ComputerPress. Carlson, Bruce M (1996). Patten's Foundations of Embryology, McGraw Hill, Inc.

SHIVAJI UNIVERSITY, KOLHAPUR

Syllabus of B.Sc. Part III Zoology

Zoology Paper- XIV

DSE-E32 (IMMUNOLOGY)

Theory: 30 hrs. (37.5 lectures of 48 minutes) (Credits 2)

Unit 1: Overview of the Immune System   7

1. Introduction to basic concept in immunology
2. Principles of innate and adaptive immune system

Unit 2: Cells and Organs of the immune system   8

1. Haematopoeisis
2. Cells of immune system
3. Organs (Primary and Secondary lymphoid organs) of the immune system
4. Immune responses- Humoral and cell mediated

Unit 3 : Antigens   7

1. Basic properties of antigens
2. B and T cell epitopes

Unit 5: Immunoglobulin / Antibodies   8

1. Structure, Classes and Functions of Antibodies
2. Antigen – Antibody interactions
3. Hybridoma Technology: Monoclonal Antibodies in diagnosis and therapeutics

SUGGESTED READINGS:

1. Kindt, T. J., Goldsby, R.A., Osborne, B. A. and Kuby, J (2006). Immunology, VI Edition. W.H. Freeman and Company. David, M., Jonathan, B., David, R. B. and Ivan R. (2006).
2. Immunology, VII Edition, Mosby, Elsevier Publication. Abbas, K. Abul and Lechtman H. Andrew (2003.) Cellular and Molecular
3. Immunology. V Edition. Saunders Publication.

Zoology Paper- XV

DSE-E31 (Applied Zoology - II)

Theory: 30 hrs. (37.5 lectures of 48 minutes) (Credits 2)

Unit 1: Apiculture   8
1. Types and casts of honey bee
2. Honey Comb
3. Bee Keeping
    a. Artificial models of bee hive – Newton and Langstroth models
    b. Bee keeping Equipments
    c. Extraction of Honey
4. Medicinal Value of Honey

Unit 2 : Animal Husbandary   5
1. Indigenous and exotic breeds of cattle
2. Preservation and artificial insemination in cattle
3. Induction of early puberty
4. Synchronization of estrus in cattle
5. Commercial importance of dairy farming

Unit 3: Pearl culture   4
1. Species of oyster
2. Process of Pearl formation: natural and artificial
3. Maintenance of oysters
4. Harvesting
5. Importance of Pearl

Unit 4: Freshwater prawn culture   3
1. Species of Prawn
2. Site selection
3. Farm Construction
4. Production system: fertilization, Larval Development, Food and feeding
5. Harvesting

Unit 5: Fish Technology   5
Genetic improvements in aquaculture industry:
1. Induced breeding
2. Transportation of fish seed
3. Feeding and development
4. Harvesting and Marketing

Unit 4 : Goat Farming-   **5**

1. Breeds
2. Feeding
3. Housing
4. Economic Importance

SUGGESTED READINGS:

1. Mollusca - Hyman.
2. Prawn and Prawn Fishery of India - Kurian.
3. Fish Culture - K. H. Alikuhni.
4. Fish Culture - Lagter.
5. Fishes of India. - Khanna.
6. Hand Book of Animal Husbandary and Dairy - Mudlyer.
7. Bee keeping in India - Sardar Sing.
8. Bee Keeping in India- M. G. Smith.
9. Poultry keeping in India - Naidu P.N.M.
10. Poultry Husbandary - M. A. Jule. 18. Poultry Husbandary - Moarthy.
11. Outlines of Dairy Technology - Sukumar De.
12. Milk and milk products - Clarence Henry Eckles,Willes Barnes Combs, Harold Macy

SHIVAJI UNIVERSITY, KOLHAPUR
Syllabus of B.Sc. Part III Zoology

Zoology Paper- XVI
DSE-F32 (Insect Vectors and Histology)
Theory: 30 hrs. (37.5 lectures of 48 minutes) (Credits 2)

Unit I: Dipteran as Disease Vectors   18

1. Dipteran as important insect vectors
   a. Mosquitoes
   b. Sand fly
   c. Houseflies
2. Study of mosquito born diseases –
   a. Malaria
   b. Dengue
   c. Chikungunya
   d. Viral encephalitis
   e. Filariasis
3. Control measures of Mosquitoes
4. Study of house fly as important mechanical vector
   a. Myiasis, Control of house fly

Unit II: Siphonoptera as Disease Vectors   6

1. Fleas a important insect vectors
2. Host-specificity
3. Study of Flea-borne diseases
   a. Plague
   b. Typhus fever
4. Control of fleas

Unit III: Histology of mammalian organs   6

Tooth, tongue, Salivary glands, Stomach, Duodenum, Ileum, Liver, Pancreas, Kidney

SUGGESTED READINGS:

1. Imms, A.D. (1977). A General Text Book of Entomology. Chapman & Hall, UK Chapman, R.F. (1998).

2. The Insects: Structure and Function. IV Edition, Cambridge University Press, UK Pedigo L.P. (2002).

3. Entomology and Pest Management. Prentice Hall PublicationMathews, G. (2011).

4. Integrated Vector Management: Controlling Vectors of Malaria

5. Insect Vector Borne Diseases. Wiley-Blackwell

6. Textbook of Histology: Bloom W and Fawcett D.W.

7. Histology: Lippinocott. Ham, A.W.

8. Histology: Greep, R.O and well, L.

9. An Atlas of Histology. Heinemann Educational Book Ltd. London and ELBS: Freeman. W.H. and Bracegirdle, B.

10. Microscopic Anatomy of vertebrates, Lea and Febigen. Philaldelphia: Kendall, J.I.

11. Histology of Mammals: Athavale, M.V and Latey, A. N.

SHIVAJI UNIVERSITY, KOLHAPUR
Syllabus of B.Sc. Part III Zoology
Zoology Practical – I (Credits-02)

Comparative anatomy and developmental biology of vertebrates

I. Comparative Study of following
1. V.S. of skin of vertebrates
2. Digestive system of vertebrates
3. Respiratory system of vertebrates
4. Heart of vertebrates
5. Brain of vertebrates
6. Osteology
   a) The skeleton of fowl (Disarticulated)
   b) The skeleton of rabbit (Disarticulated)
   c) Mammalian skull's – (any one herbivorous and one carnivorous animal)

II. Study of developmental stages of frog.
1. Cleavage
2. Blastulation
3. Gastrulation
4. Neurulation
5. Stages of metamorphosis in frog
   a. External gill stage
   b. Internal gill stage
   c. Forelimb stage
   d. Hind limb stage
   e. Tail bud stage
   f. Juvenile stage

III. Study of Chick Embryo
12. Whole mount of chick embryo – 18, 24, 33, 48 and 72 hours.
13. T.S. of chick embryo – 18, 24, 33, 48 and 72 hours.

VI. Preparation of whole mount chick embryo.

IV. Study of Histological structures of placenta (permanent slide or microphotographs)
1) Epitheliochorial
2) Endotheliochorial
3) Hemochorial
4) Syndesmochorial
5) Hemoendothelial

V. Examination of Gametes – Frog or Rat sperm & ovum through slides or microphotographs.

Applied Zoology – II and Immunology

Unit 1: Applied Zoology

1. Apiculture
   a. Casts of Honey Bees
   b. Bee Hive(Photographs or models)
   c. Pollen Basket
   d. Sting Apparatus
   e. Honey
   f. Newton's model of Bee Hive (Photographs or models)
   g. Bee keeping Equipments (Photographs or models)

2. Preservation & Artificial insemination in cattles
8. Pearl culture
   a. Species of oyster
   b. Process of Pearl formation: natural and artificial
   c. Importance of Pearl
9. Freshwater prawn culture
   a. Species of Prawn
   b. Site selection
   c. Farm Construction
   d. Production system
   e. Harvesting
10. Goat farming
    a. Breeds (any four = 2 Indigenous and 2 Exotic)
    b. Housing
    c. Feeding
6. Visit to goat farm or animal breeding centre – submission of visit report

B] Immunology

1. Study of lymphoid organ's (Photograph, Models, Videos)
2. Histological study of (slides or photographs)
   a. Spleen
   b. Thymus
   c. Lymph nodes
3. Preparation of stained blood smears to study various types of blood cells
4. Determination of ABO blood groups
5. Demonstration of
   a. ELISA
   b. Immuno-electrophoresis

C] Cell counting and viability test from splenocytes of farm breed animals / cell lines

SHIVAJI UNIVERSITY, KOLHAPUR
Syllabus of B.Sc. Part III Zoology
Zoology Practical – III (Credits-02)

Molecular biology, Animal biotechnology, Biostatistics & Biotechniques

I] Microtechnique

1. Preparation of permanent histological slides by HE technique
2. Histochemical technique
   a. AB PH 1 technique
   b. AB PH 2.5 technique
   c. PAS technique

II] Biotechniques

1. Chromatography – Separation of amino acid by paper chromatography
2. DNA isolation
3. Demonstration of DNA by feulgan technique
4. To study the following technique (photographs)
   a) Southern blotting
   b) Northern blotting
   c) Western blotting
   d) DNA sequencing (Sangers method)
   e) PCR
   f) DNA fingerprinting

III) Biostatistics

   Any 10 example based on theory

IV] Project (any suitable work possible in local area or from the syllabus) Report of

   the same to be submitted at the time of practical examination

Syllabus of B.Sc. Part III Zoology
Zoology Practical – IV (Credits-02)

Aquatic biology, insect vector & diseases

A] Aquatic biology
1. Determination of area of a lake using graphimetric & gravimetric method
2. Identify the zooplanktons present in lake ecosystem
3. Determination of turbidity or transparency from nearby lake or water body
4. Determination of dissolved oxygen
5. Determination of free CO_2
6. Determination of alkalinity (Carbonates & bicarbonates) from water collected from nearby lake or water body
7. Estimation of total hardness of water
8. Instruments used in limnology & their significance
   a) Secchi disc
   b) Van Dorn bottle
   c) Conductivity meter
   d) Turbidity meter
   e) PONAR grab sampler
9. Visit to seashore/water reservoir/animal sanctuary to study animal diversity. Report of tour should be submitted at the time of practical examination
10. Endocrine glands (Anatomy and Histology) – Thyroid, Parathyroid, Adrenal and Pancreas.

B] Insect Vectors & diseases
10. Study of different kinds of mouthparts of insects
   a) Chewing & biting
   b) Chewing & lapping
   c) Piercing & sucking
   d) Sponging
   e) Siphoning
11. Study of following insect vectors through permanent slides or photograph
   a) Insect vector – Mosquito, sandfly & housefly
   b) Study of mosquito born diseases – Malaria, dengue, chikungunya, encephalitis, filariasis
   c) Study of sandfly born diseases – Visceral leishmanians, Cutaneous leishmanians, Phlebotomus fever
   d) Study of housefly born diseases – Myiasis
   e) Study of flea born diseases – Plague, typhus
12. Histology of Following mammalian organs-
   a) Tooth (V.S.) b) Tongue c) Salivary gland d) Stomach e)Duodenum f) Ileum g) Liver h) Pancreas i) Kidneys

SHIVAJI UNIVERSITY, KOLHAPUR.

Accredited By NAAC with 'A' Grade

Faculty of Interdisciplinary Studies

Structure, Scheme and Syllabus For

Certificate and Diploma Course
in Food Processing and Preservation.

Syllabus to be implemented from June, 2020 onwards.

UGC-Community College

STRUCTURE AND SYLLABUS

Certificate Course & Diploma in Food Processing & Preservation

TITLE   **:** Certificate Course & Diploma
                                                     (Food Processing & Preservation)
                                                     Syllabus (Semester pattern)
                                                     Under the faculty of Science

YEAR OF IMPLEMENTATION: Syllabus will be implemented from July 2018

DURATION   Certificate Course (six months)
                                                       Diploma (One Year/ two semesters)

PATTERN OF EXAMINATION   Semester pattern

Theory examination: At the end of semester as per Shivaji University rules
The theory examination shall be at the end of the each
semester.
                            • All the general theory papers shall carry 40 marks and all
vocational theory papers shall carry 50 marks.
                            • Evaluation of the performance of the students in theory shall
be on the basis of semester examination as mentioned
above. Question paper will be set in the view of entire syllabus
preferably covering each unit of the syllabus.

• **Nature of question paper for Theory examination** (Excluding Business Communication Paper)
–
                    i. There will be seven questions carrying equal marks.
                    ii. Students will have to solve any five questions.
                Q. No. 1 : Short answer type question with internal choice
                        (Two out of Three)
                Q. No. 2 to Q. No. 6 : Long answer type questions
                Q. No. 7 : Short Notes with internal choice
            (Two out of Three)
Practical examination: Evaluation of the performance of the students in practical
shall be on the basis of semester examination (Internal
assessment at the end of Semester I& II)

MEDIUM OF INSTRUCTIONS: English /Marathi.

Eligibility for Admission : 10 + 2 from any faculty or equivalent in any related stream
.

Eligibility for Faculty :
1) M. Tech. (Food Tech./Food processing)
 M. Sc. (Food Science and Nutrition / FoodProcessing/ Food Science and Technology/ Home-Science/ Food Science and Quality Control with NET / SET
2) M. A (English) with NET/SET for Business Communication

Eligibility for Laboratory Assistant
B. Sc. (Food Science and Nutrition / Food Processing food Science and Technology or
B. Tech (Food Tech./ Food processing) home Science/ Food Science

Structure of the Course

Semester-I (Certificate Course)

Sr No	Paper No.	Title of Paper	Theory/ Practical	Marks	Distribution of Marks		Credits	
					Theory	Practical	Theory	practical
1	I	Business Communication-I	Theory/ Practical	50	40	10	3	2
2	II	Fundamentals of Food Science-I	Theory/ practical	50	40	10	3	2
3	III	Food preservation	Theory	50	50	---	3	---
4	IV	Fundamentals of Food chemistry	Theory	50	50	---	3	---
5	V	Food microbiology	theory	50	50	---	3	---
6	VI	Laboratory work: Food preservation	Practical	50	---	50	---	3
7	VII	Laboratory work Fundamentals of food chemistry	Practical	50	---	50	---	3
8	VIII	Laboratory work Food microbiology	practical	50	---	50	----	3
9	IX	Project/study tour	_	50	---	50	---	2

Scheme of Teaching: Semester-I (Certificate Course)

Sr.No.	Paper No.	Title of Paper	Distribution of workload (per week)		
			Theory	practical	Total
1	I	Business Communication-I	4	2	6
2	II	Fundamentals of Food Science-I	4	2	6
3	III	Food preservation	4	---	4
4	IV	Fundamentals of Food chemistry	4	---	4
5	V	Food microbiology	4	---	4
6	VI	Laboratory work: Food preservation	---	4	4
7	VII	Laboratory work: Fundamentals of food chemistry	---	4	4
8	VIII	Laboratory work: Food microbiology	---	4	4
9	IX	Project/study tour	---	---	---
		Total	20	16	36

Structure of the Course

Semester-II (Diploma Course)

Sr No	Paper No.	Title of Paper	Theory/ Practical	Marks	Distribution of Marks		Credits	
					Theory	Practical	Theory	practical
1	X	Business Communication-II	Theory/ practical	50	40	10	3	2
2	XI	Fundamental of food science -II	Theory /practical	50	40	10	3	2
3	XII	Milk & Milk Processing	Theory	50	50	---	3	---
4	XIII	Bakery &Confectionary	Theory	50	50	---	3	---
5	XIV	Hygiene & Sanitation	Theory	50	50	---	3	---
6	XV	Laboratory work: Milk & Milk processing	Practical	50	---	50	---	3
7	XVI	Laboratory work: Bakery &Confectionary	Practical	50	---	50	---	3
8	XVII	Laboratory work: Hygiene & Sanitation	Practical	50	---	50	---	3
9	XVIII	Project/ Job Training	----	50	---	50	---	2

Scheme of Teaching: Semester-II (Diploma Course)

Sr.No.	Paper No.	Title of Paper	Distribution of workload (per week)		
			Theory	practical	Total
1	X	Business Communication-II	4	2	6
2	XI	Fundamentals of food science-II	4	2	6
3	XII	Milk & Milk processing	4	---	4
4	XIII	Bakery Confectionery	4	---	4
5	XIV	Hygiene & Sanitation	4	---	4
6	XV	Laboratory work: Milk & Milk Processing	---	4	4
7	XVI	Laboratory work: Bakery &Confectionary	---	4	4
8	XVII	Laboratory work: Hygiene & Sanitation	---	4	4
9	XVIII	project/Job Training	--	---	---
		Total	20	16	36

Food Processing & Preservation

Paper – I: Business Communication-I

Distribution of Workload: **Theory:** 40 Marks.

                                     Practical: 10mark

Theory: **04 lectures per week**
Practical: **02 lectures per week per batch of 20 students**
Total Workload: 06 lectures per week of 60 mins.

Unit 1: Use of English in Business Environment
Topics:
    Business Vocabulary: Vocabulary for banking, marketing and for maintaining public relations
    What is a sentence?
    Elements of a sentence
    Types of sentence: Simple, compound, complex

Unit 2: Writing a Letter of Application and CV/ Resume
Topics:
    Structure of a letter of application for various posts
    CV/ Resume and its essentials

Unit 3: Presenting Information/Data
Topics:
    Presenting information/data using graphics like tables, pie charts, tree diagrams, bar diagrams, graphs, flow charts

Unit 4: Interview Technique
Topics:
    Dos and don'ts of an interview
    Preparing for an interview
    Presenting documents
    Language used in an interview

Practical: Based on the theory units 10 Marks.

Reference Books:

Sethi,Anjanee&BhavanaAdhikari.*Business Communication*. New Delhi: Tata McGraw Hill

Tickoo, Champa& Jaya Sasikumar.*Writing with a Purpose*. New York: OUP, 1979.

Sonie, Subhash C. *Mastering the Art of Effective Business Communication*. New Delhi:

Student Aid Publication, 2008.

Herekar, Praksh. *Business Communication.*Pune: Mehta Publications, 2007.

Herekar, Praksh. *Principals of Business Communication.*Pune:

Time: 2 hours   **Total Marks: 40**
Q. 1 Do as directed. Question items on **Unit 1** to be asked.   10   (10 out 12)
Q. 2 Write a letter of application.   10
        OR
    Draft a CV/ Resume for a particular post.   10
Q. 3 Present a given information or data using a table/ chart/
pie diagram, etc
(Any one diagram to be drawn.)   10
Q. 4 Fill in the blanks in the given interview.   10

Practical Evaluation: **10 Marks**
Oral and Presentation based on the units prescribed.

Food Processing & Preservation
Paper-II Fundamentals of food science-I

Total marks: 50 Theory: 04lectures

per week   Theory: 40marks

Practical: 02lectures/week/batch   practicals:10marks Total Workload: 06 lectures per

week of 60 mins.

Objectives - 1. To understand basic concept of food
                2. To understand functions of food different Food Groups.

Course content :

Unit I - Introduction to food science

- Concept of food, food science

 - Objectives of food science

- Functions of food

Unit – II - Classification of food

- According to food science

- Basic five food groups

- Selection of food

Unit – III - Methods of cooking

- Traditional cooking methods

- Modern cooking methods

-Objectives and importance of cooking

Unit – IV - Food Preparation and storage

- Basic terms used in food preparation

- Pre-preparation for cooking

- Storage of raw and cooked food

Practicals :

1) Introduction to laboratory rules.

2) Equipments used in cooking

3) Terms used in cooking.

4) Weights and Measures of raw and cooked food.

5) Methods of cooking -

1) Traditional methods – Preparation of any two recipes from following:

a) Boiling b) Roasting c) Frying d) Steaming

2) Modern methods - Preparation of any two recipes from the following:

a) Baking b) Solar c) Microwave d) Combination

References :

1) B. Shreelaksmi : ``Food Science'' (second edition), New Age International, New Delhi.

2) Swaminathan : ``Text book of Food Science'', Vol-1, BAPPCO, Banglore

3) Devendrakumar Bhatt &PriyankaTomar : An Introduction to Food Science, Technology & Quality Management, Kalyani Publishers.

4) Sumati R. Mudambi : Fundamentals of Food & Nutrition wiley Eastern Ltd., New Delhi.

Scheme of Internal Practical Evaluation	**10 marks**
1) Submission of Record book	5 marks
2) Viva – Voce	5 marks

Workload-4
Theory: 04lectures per week   **Total marks: 50**

Objectives :
To enable student –
1) To acquire knowledge of food preservation and preservation technique.
2) To know the importance and basic principles of food preservation.

Course content :

Unit I - Introduction to food preservation.

- Concept, importance of food preservation.

- Common terms used in food preservation.

- Classification of food on the basis of pH value, technology,

physiology changed condition, moisture content.

- Principles of preservation.

Unit – II - Preservation by using Preservatives
     - Definition and Concept

     - Types of preservatives-Natural and Artificial

     - Mode of action of different preservatives

Unit – III - Preservation by drying
- Concept, history Types of drying and dryers.

- Treatments prior to drying

Unit – IV - Preservation by use of high temperature & Low Temperature
- Concept and importance

- Various methods used – Pasteurization, Boiling, Canning

- Effect of high temperature on microbial content of food. - Types of

preservation methods by low temperature

     - Different equipments used for preservation by low temperature

Reference :

1) PrakashTriveni : Food Preservation, Aadi Publication, Delhi.

2) M. ShafiurRahman : Hand Book of Food Preservation, Marcel Dekker Inc,

New york.

3) McWillims and Paine : Modern Food Preservation, Surjeet Publication

Food Processing & Preservation

Paper-IV FUNDAMENTALS OF FOOD CHEMISTRY

Workload - 4
Theory: 04lectures /week   **Total marks: 50**

Objective- To understand Basic Chemistry of Food.
                 To understand nature & Properties of food

Unit I -   CARBOHYDRATES

   -Concept, definition of carbohydrates

   -Classification of carbohydrates

   -Properties of carbohydrates

   -Sources

Unit II - PROTEIN

   -Concept, definition, essential, non-essential amino acids

   -Classification of proteins

   -Properties of proteins

   - Sources

Unit III - FATS

   -Concept, definition, essential non-essential Fatty acids

   -Classification of Fats

   -Sources, Function of Fats

Unit IV - VITAMINES& MINERALS

   -Vitamins - Types, sources, functions & deficiency

   - Minerals - Sources, functions, deficiency

REFERNCE BOOKS

1. Food Chemistry by H.D.Belitz
2. Food Chemistry by Hoagland Meyer
3. Food Analysis by S.Suzanne Nielsen
4. Handbook of Food Chemisty by Peter C.K.
5. Advance Food Chemisty by Syed AftabIqbal&NilofarIqbal.

Workload -4

Theory: 04 lectures per week   **Total marks: 50**

Objectives: 1) To study the microbiological techniques

2) To understand the food microbiology

Unit I - INTRODUCTION TO FOOD MICROBIOLOGY
- Introduction to Food Microbiology
- Concept of Microorganisms
- Types of Microorganisms
- Importance of Microbes in Food

Unit II - FOOD CONTAMINATION & SPOILAGE
- Concept, definition, difference
- Between contamination & spoilage
- Signs of contamination & spoilage in Food
- Introduction to disease caused by spoiled food contamination of different food.

Unit III – STAINING&ISOLATION TECHNIQUES
- Concept definition types of stains & staining
- Different staining procedures
- Definition of Isolation
- Different isolation techniques.

Unit IV - IMPORTANCE OF MICROBIOLOGY IN FOOD
- Concept, useful, harmful microbes
- Important Microorganisms for food
- Used necessity of microbes in Food preparations

REFERENCE BOOKS

1. Food Microbiology by William Frazier
2. Food Microbiology by W.M.Faster
3. Laboratory manual of Food Microbiology by NeelimaGarg, K.L.Garg
4. Fundamental Food Microbiology by Biber Ray &ArunBhunia.
5. Handbook of culture media for Food Microbiology by Curtis R.M.Baird

Workload: 04.   **Total marks: 50**
Practical: 04lectures/week/batch

Practicals:

1)Introduction to drying equipments

2) Applications of driers.

3) Classification of food based on pH value and moisture content.

4) Preservation by natural prservatives

5) study the technique of boiling of fruits

6) Physiological change in food after drying

7) Preparation of food product by drying

i) Onion flakes

ii) Raw mango powder / Leafy vegetable powder

iii) Resins

iv) Papad and chips

8) Blanching of vegetables

9) Visit to pasteurization unit

Scheme of practical evaluation

Internal practical evaluation   **50 marks**

i) Submission of practical record book   20 marks

ii) Submission of visit report   15 marks

iii) Viva – Voce   15 marks

Food Processing & Preservation

Paper –VII Fundamentals of Food Chemistry

Laboratory work

Workload: 04.   **Total marks: 50**
Practical: 04lectures/week/batch

Practicals:

1. Preparation of NaOH solution
2. Study of Laboratory Instruments
3. Determination of pH of different Food
4. Determination of Acidity of milk
5. Determination of Acidity of fruit juice.
6. Estimation of Moisture Content
7. Study of different Sugar stages at different temperature
8. Melting Point of Fats
9. Acid Value of an oil
10. Isolation of starch from potato
11. Study the browning of fruits and vegetables
12. Industrial Visit

Scheme of practical evaluation

Internal practical evaluation	**50 marks**
i) Submission of practical record book	20 marks
ii) Submission of visit report	15 marks
iii) Viva -voce 15marks	

Workload: 04.   **Total marks: 50**
Practical: 04lectures/week/batch

Practicals:

1. Study the compound microscope
2. Study the laboratory instruments
3. Study sterilization techniques for glasswares
4. Study size, shape of microbiology
5. Identification of spoiled Food Samples
6. Study the Monochrome staining
7. Study the Gram staining
8. Preparation of Nutrient Agar
9. Preparation MacConkey's Agar
10. Preparation of Sabroud's Agar
11. Study isolation techniques
12. Study the amylase activity
13. Microbial sampling of an air.
14. Industrial Visit.

Scheme of practical evaluation

Internal practical evaluation	**50 marks**
i) Submission of practical record book	20 marks
ii) Submission of visit report	15 marks
iii) Viva-voce	15marks

Diploma Semester-II

Food Processing & Preservation

Paper-X Business Communication- II

Workload-06 lectures per week of 60 mins

Total marks:50

Theory:40mark

Theory: 04 lectures per week

Practicals: 10 marks   Practical: 02 lectures per

week per batch of 20 students

Units Prescribed for Theory:

Unit 1: Group Discussion

Topics:

Preparing for a Group Discussion

Initiating a Discussion

Eliciting Opinions, Views, etc.

Expressing Agreement/ Disagreement

Making Suggestions; Accepting and Declining Suggestions

Summing up.

Unit 2: Business Correspondence

Topics:

Writing Memos, e-mails, complaints, inquiries, etc.

Inviting Quotations

Placing Orders, Tenders, etc.

Unit 3: English for Negotiation

Topics:

Business Negotiations

Agenda for Negotiation

Stages of Negotiation

Unit 4: English for Marketing

Topics:

Describing/ Explaining a Product/ Service

Promotion of a Product

Dealing/ bargaining with Customers

Marketing a Product/ Service: Using Pamphlets, Hoardings, Advertisement,

Public Function/ Festival

Practical: Based on the theory units

Reference Books:
Herekar, Praksh. *Business Communication.*Pune: Mehta Publications, 2007.
Herekar, Praksh. *Principals of Business Communication.*Pune: Mehta Publications, 2003.
John, David. *Group Discussions*.New Delhi: Arihant Publications.
Kumar, Varinder. *Business Communication*. New Delhi: Kalyani Publishers, 2000.
Pardeshi, P. C. *Managerial Communication.* Pune: NiraliPrakashan, 2008.
Pradhan, N. S. *Business Communication.* Mumbai: Himalaya Publishing House, 2005
Rai, Urmila& S. M. Rai.*Business Communication.*Mumbai: Himalaya Publishing House, 2007.
Sethi, Anjanee&BhavanaAdhikari.*Business Communication*. New Delhi: Tata McGraw Hill.
Sonie, Subhash C. *Mastering the Art of Effective Business Communication*. New Delhi: Student Aid Publication, 2008.
Tickoo, Champa& Jaya Sasikumar.*Writing with a Purpose*. New York: OUP, 1979.
Whitehead, Jeoffrey& David H. Whitehead.*Business Correspondence*. Allahabad: Wheeler Publishing, 1996.

Pattern of a Question Paper
Business Communication-II
Semester –II Paper: X

Time: 2 hours   **Total Marks: 40**

Q. 1 Fill in the blanks in the following Group Discussion.
(On **Unit 5**) (10 out 12)
     10

Q. 2 Attempt **ANY ONE** of the following (**A** or **B**):
(On **Unit 6**)
                                                                                        10

Q. 3 Fill in the blanks with appropriate responses:
(On **Unit 7**)
                                                                                        10

Q. 4 Attempt **ANY ONE** of the following (**A** or **B**):
(On **Unit 8**) (10 out 12)
                                                                                        10

Practical Evaluation: **10 Marks**
Oral and Presentation based on the units prescribed.

Diploma Semester-II
Food Processing & Preservation
Paper-XI Fundamentals of Food Science- II

Total Marks: 50   **Workload-06 lectures per week**

Theory:40marks

Theory: 04 lectures per week **Practicals: 10 marks**

Practical: 02 lectures per week per batch

Objectives:

• To enable students -

1) To understand the basic concept of various cookery.

2) To become familiar with preparation of various cookery.

Course Content:

Unit I - Cereal cookery

 - Structure, composition and Importance of cereal grains

 - Types of cereals used in cooking

 - Cereal cookery- Gelatinization, Dextrinization and Identity

 of grain

 - Processed cereals, millets and Ready-To- Eat cereals

 used in cooking

Unit – II - Pulse and Legume Cookery

 - Definition, composition and structure of pulses

 - Cooking of Legumes

 - Factors Affecting cooking time of pulses and legumes

 - Uses of legumes in cookery

Unit – III - Nuts and Oil seeds Cookery

 - Types and composition of Nuts and Oil seeds

 - Toxic substances in Nuts and Oil seeds

 - Changes during cooking and storage

 - Function of Nuts and Oil seeds in cookery

Unit – IV - Fruits and Vegetables Cookery

 - Classification of Fruits and vegetables

 - Colour pigments in Fruits and vegetables

 - Effect of heat, acids and alkali on Fruits and vegetables

 - Changes during cooking and storage

Practicals:

1. Weight & measurement of raw & cooked foods

2. Study different cutting & grading of food

3. Study the boiling method

4. Study the blanching techniques of food

5. Preparation of puffed products

6. Study the shallow fat frying techniques of food

7. Study the deep fat frying techniques

8. Study the sensory parameters of food products

References:
1) B. Shreelaksmi : ``Food Science'' (second edition3 (second edition), New Age International, New Delhi.
2) Swaminathan : ``Text book of Food Science'', Vol-1, BAPPCO, Banglore
3) Devendrakumar Bhatt &PriyankaTomar : An Introduction to Food
Science, Technology & Quality Management, Kalyani Publishers.
4) Sumati R. Mudambi : Fundamentals of Food & Nutrition wiley Eastern Ltd., New Delhi.
5) Philips T E, Modern Cooking for teaching and trade, Volit orient longman, Bombay

Scheme of Internal Practical Evaluation   **10 marks**

    1) study technique of boiling/ blanching/ sensory parameters/

       product preparation by puffing/ frying   06 marks

2) Submission of Record book   04 Marks

Food Processing & Preservation

Paper- XII Milk& milk processing

Total workload :04 lectures per week

Theory: 04 lectures per week   Total Marks: 50

Objectives–1. To study Chemistry of milk
                   2. To understand techniques in milk processing

Unit I: Introduction to milk

Definition, composition of milk, nutritive value of milk.

Physicochemical properties of milk

Factors affecting composition of milk

Unit II: Processing of milk

Need of dairy process

Buying &collection of milk

Cooling & transportation of milk

Pasteurization of milk

Unit III: Special milk

Flavored milk

Tonned milk, Double tonned,skimmed milk

Condensed milk, rehydrated milk

UHT milk

Unit IV: Dairy products

Fermented product – curd yoghurt

Frozen milk product – Ice-cream

Heat acid coagulated – Paneer, Chakka

Heat desiccated product – khoa

Enzyme coagulated product

Reference Books-

1. Outlines of dairy technology by sukumar De

2. Milk testing A Laboratory control of milk by J.G Davis

3. Cheese & Butter by V. cheke& A. Shepard

4. Economics of dairy cooperatives by Dr. Binay Kumar Singh

5. Dairy cooperation &rural poverty by Dr. Ram Praveshsingh.

Diploma Semester-II

Food Processing & Preservation

Paper-XIII Bakery & Confectionary

Workload ;4   Total marks: 50

Theory: 04 lectures per week

Objectives – **1. To develop different bakery product**

2. To study Role & chemistry of bakery & confectionary

Unit I: Introduction to bakery

1. Ingredients used in bakery products

2. Role of ingredients

3. Introduction to bakery machineries

4. Scope of bakery processing

Unit II: Bakery products

1. Biscuits & cookies – Introduction, Difference, Ingredients process, Packaging & storage

2. Bread - Introduction, Difference, Ingredients process, Packaging & storage

3. Cake – Types - Introduction, Difference, Ingredients process, Packaging & storage

4. Judging & Grading of bakery product

Unit III: Introduction to confectionary

1. Ingredients used in confectionary

2. Role of ingredients

3. Types of confectionary

4. Cocca Processing

Unit IV: Confectionary product

1. Traditional product

2. Hard boiled candy

3. Soft boiled candy

4. Judging & Grading

Reference Books-

1. Technology of biscuits, rusks, crackers & cookies by EiRi

2. Technology of confectionary, chocolate, toffee, candy, jelly product by EiRi

3. Textbook of bakery & confectionary by VogambalAshokkumar.

4. Complete technology book on bakery products by NIIR board.

5. Theory of bakery & patisserie by Parvindar S Bali

Food Processing & Preservation

Paper -XIV Hygiene & Sanitation

Workload: 4   **Total marks: 50**

Theory: 04 lectures per week

Objectives -1.To understand concept of Hygiene & Sanitation.
                2. Tostudy techniques of maintain Hygiene& Sanitation

Unit I: Introduction to hygiene & sanitation

1. Definition of hygiene & sanitation

2. Difference between hygiene & sanitation

3. Personal hygiene - Habits

4. Use of hygiene at workplace.

Unit II: Safety at work place

1. Concept

2. Safety during preparations

3. Safety about workers.

4. Hazards – Physical Chemical & Microbial.

Unit III: Diseases -

1. Food Infection& Intoxication

2. Difference between Infection & Intoxication

3. Diseases – Salmonellosis, Cholera, Swine Flu, Chickengunia.

4. Prevention.

Unit IV: Pest control

1. Concept, Types Pest

2. Pesticides – types, applications forms of pesticides.

3. Precautions during handling pesticides.

Reference Books-

1. Food Born diseases by GirirajSahu.
2. Food hygiene & sanitation by S. Roday.
3. Fundamentals of food hygiene, Safety & Quality by Alok Kumar.
4. Principles of Food sanitation by Norman G. Marriott.

Food Processing & Preservation

Paper – XV Milk & Milk processing

Laboratory work

Workload: 04.   **Total marks: 50**
Practical: 04lectures/week/batch

Practicals:

1. Physical examination of milk
2. Chemical examination of milk
3. Plate form test
4. Adulteration test for milk.
5. Efficiency of Pasteurization of milk
6. Preparation of Paneer
7. Preparation Rasogulla
8. Preparation Flavoured milk
9. PreparationButter Milk
10 preparation of curd.
11 preparation icecream
12 preparation of basundi
13 preparation of condensed milk
14. Industrial Visit

Scheme of practical evaluation

Internal practical examination: **50 marks**

i)   Preparation of any one product   15 marks

ii)   Submission of practical record book   15 marks

iii)   Submission of visit report   10 marks

iv)   Viva – Voce   10 marks

Food Processing & Preservation

Paper – XVI Bakery & Confectionary

Laboratory work

Workload: 04.   **Total marks: 50**
Practical: 04lectures/week/batch

Practicals:

1. Acidity of wheat flour
2. Determination of gluten content
3. Moisture Content
4. Examination of Sugar Stages at different temperature.
5. Preparation of Cookies.
6. Preparation of Cherry
7. Preparation Cake
8. Preparation Chocolate
9. Preparation Candid nuts
10 preparation of pudding
11 preparation of biscuits
12 preparation of dhokala
13. Examination of Spoiled bakery products.
14. Industrial Visit

Scheme of practical evaluation

Internal practical examination: **50 marks**

i)   Preparation of any one product from cake/cherry/

       chocolate/candid nuts   15 marks

ii)   Submission of practical record book   15 marks

iii) Submission of visit report   10 marks

iv)   Viva – Voce   10 marks

Food Processing & Preservation

Paper – XVII Hygiene& sanitation

Laboratory work

Workload: 04.   **Total marks: 50**

Practical: 04lectures/week/batch

Practicals:

1. Examination of Physical Hazard.

2. Examination of Chemical Hazard.

3. Study the techniques of personalhygiene

4. Study the Swab Method for packaging material.

5. Study the Swab Method for personal hygiene.

6. Study CIP techniques

7. Preparation of different sanitizers & detergents for cleaning purpose.

8. Microbial sampling of an air.

9. Industrial Visits.

Scheme of practical evaluation

Internal practical examination:	**50 marks**
i) Microbial analysis	10 marks
ii) Chemical analysis	05 marks
iii) Submission of practical record book	15 marks
iv) Submission of visit report	10 marks
v) Viva – Voce	10 marks

SHIVAJI UNIVERSITY, KOLHAPUR.

Accredited By NAAC with 'A' Grade

Faculty of Inter Disciplinary Studies

Structure, Scheme and Syllabus For

Certificate and Diploma Course

in Beauty and Wellness

Syllabus to be implemented from June, 2020 onwards.

Structure of the Course:

Certificate Course in Beauty and WellnessSemester - I

Sr.No	Paper No.	Titie	Theory/ Practical/ Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
1	I	Business Communication -I	Theory/ Practical	50	40	10	3	2
2	II	Basics of Computer-I	Theory/ Practical	50	40	10	3	2
3	III	Personality Development	Theory/ Practical/	50	50	-	3	-
4	IV	Basic beauty care	Theory/ Practical/	50	50	-	3	-
5	V	Skin Care and Face Make Up	Theory/ Practical/	50	50	-	3	-
6	VI	Practical- I- Basic Beauty Care	Practical	50	-	50	-	3
7	VII	Practical – II- Skin Care and Facial	Practical	50	-	50	-	3
8	VIII	Computer Lab Work	Practical	50	-	50	-	3
9	IX	Lab Work Project / Industrial Visit / Study Tour		50	-	50	-	2

Structure of the Course:

Diploma Course in Beauty and Wellness Semester - II

Sr.No	Paper No.	Titie	Theory/ Practical/ Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
1	X	Business Communication -II	Theory/ Practical	50	40	10	3	2
2	XI	Computer concepts & application– II	Theory/ Practical	50	40	10	3	2
3	XII	Personality Development –II	Theory/ Practical/	50	50	-	3	-
4	XIII	Skin Care and Face Makeup -II	Theory/ Practical/	50	50	-	3	-
5	XIV	Hair Care - I	Theory/ Practical/	50	50	-	3	-
6	XV	Sap Therapy and Food Diet – I	Practical	50	50		3	
7	XVI	Practical- III Skin Care, Facial and Hair Care	Practical	50	-	50	-	3
8	XVII	Practical – IV-Advanced Beauty Care	Practical	50	-	50	-	3
9	XVIII	Project / Industrial Visit / Study Tour/ OJT		50	-	50	-	2

Business Communication – I Paper no - I

Total Workload: 06 lectures per Week of 60 min.

Distribution of Workload:

Theory: 04 Lectures per week

Practical: 02 Lectures per week per batch of 50 students

Objective:

1. **To understand how to communicate with customers & employees**
2. **To understand digital communication and its mediums.**

Units Prescribed for Theory: **Marks : 40**

Unit 1 – Basic principles of Communication: Introduction, understanding communication, Communication process, Types of communication, 7 C's of communication.

Unit 2 – Writing effective English: Word formulation – Prefixes, suffixes, vocabulary development, basic sentence pattern, types of sentences – Simple, complex, compound.

Unit 3 – Business communication: Written communication – significance in business, Language of business writing,

Business letters- order, enquiries, & replies, sales letters, complaints, claims & adjustments letters, goodwill letters.

Unit 4 – Digital communication: Forms of digital communication – mobile communication, SMS, Social media, E-mail.

Practical based on the theory units   **Marks: 10**

References:

1. Sethi,Anjanee&BhavanaAdhikari. Business communication, New Delhi: Tata McGraw Hill Tickoo, Champa& Jaya Sasikumar. Writing with the purpose.New York: OUP, 1979.

2. Sonie, Subhash C. mastering the art of effective business communication. New Delhi: Student Aid Publication, 2008,

3. Herekar, Prakash. Business communication, Pune: Mehta publication 2007

4. Herekar, Prakash. Business communication, Pune: Mehta publication 2003

Basics of computer – I Paper No: II

Total Workload: 06 lectures per Week of 60 min.

Distribution of Workload:

Theory: 04 Lectures per week

Practical: 02 Lectures per week per batch of 50 students

Objective:

1. **To understand basics of computer.**
2. **To get knowledge related to Ms office..**

Units Prescribed for Theory: **Marks: 40**

Unit 1 – Introduction to Computer: Computer – Definition & meaning, Characteristics, generation of computer, types of computer, Input output device.

Memory – Types of memory, storage devices.

Unit 2 – Computer software & networks: Software – Definition & Types

Computer network – Types, topologies, Internet, Intranet, Extranet.

Search engine – Concept & working of search engines.

Unit 3 – MS. Word: Microsoft word – Introduction to word components, working with word documents, formatting documents, working with tables, tools.

Unit 4 – Power point: Power point- Introduction to power point components, working with PowerPoint, creating PowerPoint presentation, formatting presentation, adding effects to presentation.

Practical based on the theory units **Marks: 10**

References:

1. Lucky T, Management Information System, DP Publication

2. Clark A, Small Business Computer Systems, Hodder & Stoughton, 1987

3. Parkinson l k &ParkisonSt, Using The Micro Computer in Marketing, Tata Mcgraw Hill,1987

PERSONALITY DEVELOPMENT – I Paper no. III

Total Workload: 06 lectures per Week of 60 min.

Distribution of Workload:

Theory: 04 Lectures per week

Practical: 02 Lectures per week per batch of 50 students

Objective:

1. To understand how to handle issues in business.
2. To understand qualities and responsibilities of good leader.

Units Prescribed for Theory: **Marks: 50**

UNIT-1 Leadership – Introduction to the leadership, Leadership power, Leadership styles, Leadership in administration, qualities of leader.

UNIT – 2 Interpersonal Relations – Introduction to the interpersonal relations, Analysis relations of different ego states, Analysis of Transactions, Analysis of strokes, and Analysis of life positions.

UNIT – 3 Stress Management – Introduction to the stress, Causes of stress, Nature & Dimension of stress, Impact of stress, managing stress.

UNIT – 4 Group Dynamics – Importance of groups in organization, Team interaction in groups, Group building, Decision taking

Reference Books:

1. Cohen.R.J & M.E. Swerdlik (2002).psychological testing and assessment.McGraw Hill,USA.

2. Jackson, A.W., J.R. Morrow, D.W. Hill and R.K. Dishman (2004). Physical Activity for Health & Fitness. Human Kinetics, USA.

3. Kansal, D.K (2011). Holistic Personality Development. Sports & Spiritual Science Publication, New Delhi (2 Press).

4. Peeke, P. (2006). The National Body Challenge. Hay House, Inc., USA.

Basic Beauty Care– Paper no IV

Total Workload: 06 Lectures per week of 60 min

Distribution of Workload:

Theory: 04 Lectures per week

Practical: 02 Lectures per week per batch of 50 student

Objective:

1) To understand basic of beauty and its care.

2) To understand importance of personal hygiene.

Units Prescribed For Theory: **Marks: 50**

UNIT – 1:   Introduction & importance of beauty care, importance of personal hygiene, personal grooming. Sterilization and sanitation – purpose, methods, do's and don'ts .professional ethics.

UNIT – 2: eye brow shaping: Materials required, Tweezing and Threading, Different types of threading, different types of eye brows, and keeping in mind the face structure

UNIT – 3: Manicure and pedicure: Definition purpose, introduction tools and equipment application of creams and lotion, methods/types of pedicure and manicure. Head and leg massages step by step procedure.

UNIT – 4: Nail Art: Factors affecting nail growth. Introduction- equipment's and tools, types of nail polish, application and their methods. Different methods of nail art

Mahanadi: introduction, preparation of Mahanadi paste, Mahanadi cone preparation and application on hand and leg.

References:

1. Hair, Skin and beauty care 9The complete body Book – blossom Kocher (2000) VBSPD/VBS publishers distributors Ltd. New Delhi.

2. Complete Beautician course Dr. Renu Gupta (2001) Diamond pocket books Pvt Ltd. New Delhi.
3. Practical guide to Beautician training- Madhumitapaudwal (2002) Asian Publisher, New Delhi.
4. Classic makeup and beauty book Maureen Barry More Dave King (1996).

CERTIFICATE COURSE IN BEAUTY & WELLNESS SEM - I

SKIN CARE & FACE MAKEUP – I Paper no V

Total Workload: 06 Lectures per week of 60 min

Distribution of Workload:

Theory: 04 Lectures per week

Practical: 02 Lectures per week per batch of 50 student

Objective:

1) To understand basic skin care treatments.

2) To understand skin problems.

Units Prescribed For Theory: **Marks: 50**

UNIT – 1: Skin: Introduction & importance of skin care, Factors affecting on skin, Skin care for different season, Home remedies for skin care.

UNIT – 2: Skin Problems: Classification & Identification of Common skin problems – Acne, Blackheads, Whiteheads, Disorder of sweat glands, Disorder of oil glands, dryness, and dullness.

UNIT – 3: Cleansing & Scrubbing: 1) Cleansing - Definition of cleansing, Types of cleansers, Method of cleansing, Benefits of cleansing, Natural Cleansers.

2) Scrubbing -What is scrubbing, Importance of scrubbing, Types of Scrub, Benefits of scrubbing, Contraindications of scrubbing, How to remove black heads & white heads by using twisers.

UNIT – 4 : Bleach & Facial : 1) Bleaching – Types of bleach , Procedure and application on face, neck , hands and other parts , precaution , its advantages & disadvantages.

2) Face Massage – Facial bones, Muscles of face, Techniques of facial, step by step procedure of facial, Benefits of facial, Contraindications, Product knowledge according to the skin.

References:

1. Blossom Kochar, Hair, Skin and Beauty care, the complete Body Book, VBS publisher new Delhi, 2002.
2. Dr. Renugupta, Complete Beautician Course, Diamond Pocket books, Pvt. Ltd. New Delhi, 2001.
3. MadhumitaPauwal, Practical Guide to Beautician Training, Asian Publishers, New Delhi, 2002.

CERTIFICATE COURSEIN BEAUTY & WELLNESS SEMESTER - I

Practical- I- Basic Beauty Care - Paper VI

Total Workload: 06 Lectures per week of 60 min

Distribution of Workload:

Theory: 04 Lectures per week

Practical: 02Lectures per week per batch of 50 student

Marks 50

1. **Sterilization and sanitation methods and procedures**
2. **Threading tweezing of eye brow, upper lip, forehead and chin**
3. **Manicure**
4. **Pedicure**
5. **Application of nail polish and nail art**
6. **Preparation of Mehandi paste and application**
7. **Waxing – Hands, legs**

CERTIFICATE COURSEIN BEAUTY & WELLNESS SEMESTER - I

Practical- II- SKIN CARE AND FACIAL - Paper VII

Total Workload: 06 Lectures per week of 60 min

Distribution of Workload:

   Theory: 04 Lectures per week

   Practical: 02Lectures per week per batch of 50 student

Marks 50

1. **Facial – Types of facial (pearl, fruit, golden, silver, Home – made facial)**
2. **Bleaching**
3. **Face pack and Face Massage**
4. **Pimple Treatment**
5. **Under eye treatment**
6. **Pigmentation**
7. **Mature skin**
8. **Sun tan**
9. **Open pores**

Practical- I- Computer Lab Work - Paper VIII

Total Workload: 06 Lectures per week of 60 min

Distribution of Workload:

   Theory: 04 Lectures per week

   Practical: 02Lectures per week per batch of 50 student

Marks 50

1. Introduction to word components, working with word documents,
2.   Formatting documents, working with tables, tools.
3.   Introduction to power point components, working with PowerPoint,
4. Creating PowerPoint presentation, formatting presentation, adding effects to presentation.

Lab Work of Project / Industrial Visit / Study Tour - Paper IX

Total Workload: 06 Lectures per week of 60 min

Distribution of Workload:

Theory: **04 Lectures per week**

Practical: 02Lectures per week per batch of 50 student

Marks 50

Objectives:

The student will undertake a project work on the topic assigned by the concern guide consultation with the department on the various issues problem themes case studies and site visit. The project report will be 50 marks which would be assessed by the internal guide.

CERTIFICATE COURSEIN BEAUTY & WELLNESS SEMESTER - I

Practical- II- SKIN CARE AND FACIAL - Paper VII

Total Workload: 06 Lectures per week of 60 min

Distribution of Workload:

 Theory: 04 Lectures per week

 Practical: 02Lectures per week per batch of 50 student

Marks 50

1. **Facial – Types of facial (pearl, fruit, golden, silver, Home – made facial)**
2. **Bleaching**
3. **Face pack and Face Massage**
4. **Pimple Treatment**
5. **Under eye treatment**
6. **Pigmentation**
7. **Mature skin**
8. **Sun tan**
9. **Open pores**

CERTIFICATE COURSEIN BEAUTY & WELLNESS SEMESTER - I

Practical- I- Computer Lab Work - Paper VIII

Total Workload: 06 Lectures per week of 60 min

Distribution of Workload:

Theory: 04 Lectures per week

Practical: 02Lectures per week per batch of 50 student

Marks 50

1. Introduction to word components, working with word documents,
2. Formatting documents, working with tables, tools.
3. Introduction to power point components, working with PowerPoint,
4. Creating PowerPoint presentation, formatting presentation, adding effects to presentation.

Lab Work of Project / Industrial Visit / Study Tour - Paper IX

Total Workload: 06 Lectures per week of 60 min

Distribution of Workload:

Theory: 04 Lectures per week

Practical: 02Lectures per week per batch of 50 student

Marks 50

Objectives:

The student will undertake a project work on the topic assigned by the concern guide consultation with the department on the various issues problem themes case studies and site visit. The project report will be 50 marks which would be assessed by the internal guide.

CERTIFICATE COURSE IN BEAUTY & WELLNESS SEM - II

Business Communication – II   Paper no:X

Total Workload: 06 lectures per Week of 60 min.

Distribution of Workload:

   Theory: 04 Lectures per week

   Practical: 02 Lectures per week per batch of 50 students

Objective:

1. **To understand importance of communication.**
2. **To understand written communication.**

Units Prescribed for Theory: **Marks: 40**

Unit 1 – Communication-Meaning, Importance &Objectives , Principles of communication , Forms of communication , Process of communication , Barriers of effective communication , Techniques of effective communication.

Unit 2 – Written communication –Business letters – Inquiries, Circulars, Quotations , Acknowledgments, Executions , Complaints, Collection letters , Banking correspondence , Agency correspondence.

Application letters – Bio-data, Interview letters, Letters of reference, Letters of appointments, Conformation, Promotion, Resignation.

Unit 3 – Report writing –Types of report, components of report, Business reports, Reports by individuals, Reports by committee , Meeting-Notice-Agenda, Resolution & minutes.

Unit 4 – Oral communication –Listening & Speaking, Meeting speeches & techniques of electing response, observation methods, Group discussions & interview

Non-verbal communication- Body language , Gesture, Posture , Facial expressions, dress codes.

Practical based on the theory units   **Marks: 10**

References:

1. Sethi,Anjanee&BhavanaAdhikari.Business communication, New Delhi: Tata McGraw Hill Tickoo, Champa& Jaya Sasikumar. Writing with the purpose.New York: OUP, 1979.

2. Sonie, Subhash C. mastering the art of effective business communication. New Delhi: Student Aid Publication,2008,

3. Herekar,Prakash.Business communication, Pune: Mehta publication 2007

4.Herekar,Prakash.Business communication, Pune: Mehta publication 2003

Computer concepts & application– II Paper No: XI

Total Workload: 06 lectures per Week of 60 min.

Distribution of Workload:

Theory: 04 Lectures per week

Practical: 02 Lectures per week per batch of 50 students

Objective:

1. **To understand computer fundamentals.**
2. **To understand concepts of computer.**

Units Prescribed for Theory: **Marks: 40**

Unit 1 – Introduction to computer fundamentals-Introduction to computer , computer system hardware , computer memory , Input & Output devices , Introduction to free and open sources , Definition of Virus, Types of Virus, Uses of antiviruses.

Unit 2 – Basics of Operating system –Definition of operating system , Objectives, types, and functions of operating system.

Unit 3 – Introduction to HTML-Introduction to HTML , Working of HTML, Creating and loading HTML page , tags

Unit 4 – Use of computer in Commerce- Data processing , files & records , File organization (sequential, direct, random,index)

Computer application in business – Need & Scope.

E-commerce – Introduction , Evaluation of E-commerce , Role of E-commerce , E-commerce categories.

Practical based on the theory units   **Marks: 10**

References:

1. **Lucky T, Management Information System, DP Publication**

2. Clark A, Small Business Computer Systems, Hodder & Stoughton, 1987

3. Parkinson l k & ParkisonSt, Using The Micro Computer in Marketing, Tata Mcgraw Hill,1987

DIPLOMA COURSE IN BEAUTY & WELLNESS SEM - II

PERSONALITY DEVELOPMENT – II : Paper no - XII

Total Workload: 06 lectures per Week of 60 min.

Distribution of Workload:

    Theory: 04 Lectures per week

    Practical: 02 Lectures per week per batch of 50 students

Objective:

      1. **To understand the importance of motivating employees .**
      2. **To understand management and its advantages.**

Units Prescribed for Theory: **Marks: 50**

UNIT – 1 : Conflict Management – Introduction to the conflict , Causes of conflict , Managing conflict in organization

UNIT – 2 : Performance Appraisal –Introduction to the performance appraisal , Vertical appraisal , Horizontal appraisal , 360^{0} performance appraisal , Methods of improving techniques of performance appraisal.

UNIT - 3 : Time Management – Time as a resource , Identify important time wasters , Individual time management styles , Techniques of better time management.

UNIT – 4 : Motivation – Introduction to the motivation , Types of motivation , Motivating subordinates Analysis of motivation

Reference Books:

1. Cohen.R.J & M.E. Swerdlik (2002).psychological testing and assessment.McGraw Hill,USA.

2. Jackson, A.W., J.R. Morrow, D.W. Hill and R.K. Dishman (2004). Physical Activity for Health & Fitness. Human Kinetics, USA.

3. Kansal, D.K (2011). Holistic Personality Development. Sports & Spiritual Science Publication, New Delhi (2 Press).

4. Peeke, P. (2006). The National Body Challenge. Hay House, Inc., USA.

SKIN CARE & FACE MAKEUP –II Paper no: XIII

Total Workload: 06 Lectures per week of 60 min

Distribution of Workload:

  Theory: 04 Lectures per week

  Practical: 02 Lectures per week per batch of 50 student

Objective:

  1) To understand Skin anatomy.

  2) To understand art of makeup.

Units Prescribed For Theory: **Marks: 50**

UNIT – 1 : SKIN ANATOMY – Cell , Cell generation stages , Human body , Skin – Layers of skin , Types of skin , Skin analysis , Skin care treatments , Skin care products , Skin care methods – Natural & Artificial.

UNIT – 2: SKIN TREATMENTS – Pimple treatments, under eye treatment, Dark circle, Pigmentation, Mature skin, Suntan, Open pores, Preparation & Importance of each treatment.

UNIT – 3: DEEP CLEANSING MACHINES – Steamers: - Current, Benefits, Precaution during treatment, Contraindications, Duration of treatment according to the skin type, Dangers, Sterilization

Brushing Unit: - Current, Benefits, Precaution during treatment, Contraindications, Dangers, Sterilization of brushes.

UNIT – 4 : ART OF MAKEUP – Importance of makeup , Tools used in makeup , Cosmetics used in makeup , Types of foundation , Face powder , Face compact , Canceler, Blusher , Eye shadow.

Lipstick –Selection and application.

Makeup – Party makeup, Nude Makeup, Oily Makeup, Bridal Makeup, Corrective Makeup.

References:

1. Blossom Kochar, Hair, Skin and Beauty care, the complete Body Book, VBS publisher new Delhi, 2002.
2. Dr. Renugupta, Complete Beautician Course, Diamond Pocket books, Pvt. Ltd. New Delhi, 2001.
3. Madhumita Pauwal, Practical Guide to Beautician Training, Asian Publishers, New Delhi, 2002.

Hair Care – I Paper no: XIV

Total Workload: 06 lectures per Week of 60 min.

Distribution of Workload:

Theory: 04 Lectures per week

Practical: 02 Lectures per week per batch of 50 students

Objective:

1. **To understand hair anatomy.**
2. **To understand basics of hair care treatments.**

Units Prescribed for Theory: **Marks : 50**

UNIT - I : Structure of Hair, Types of hair, Hair growth cycle, Importance of hair care, factors affecting hair growth. Scalp massage –benefits and methods, materials required and procedure. Shampooing and rinsing-its importance, purpose and function, types of shampoo – their uses and effects, precautious, purpose of rinsing, types of rinses, benefits of rinsing and precautions.

UNIT – II : Hair cut-Knowledge of hair texture, selection of hair cut according to facial shape, occasion, age, profession, body structure, Hair texture. Hair cutting techniques, tools and equipment in hair cuts .Hair cuts – types of basic hair cuts- Trimming, straight cut, U cut, V-cut. Advanced hair cuts – layer cut, blunt cut, tapering , Graduation, bob etc. Use of Hair shaping and cutting implements. sterilization and sanitation.

UNIT – III : Hair styling – knowledge of different hair style as per hair texture, materials used for hair styling, techniques in styling – Rolls, twists, braiding, Roller setting, Blow drying, Comb out techniques, thermal hair styling- Hair dryer, Crimping rods , Straightening rods, Electric rollers Curling rods. . Natural hair pack. Artifical aids – purpose, types, cleaning and maintaining. Hair styling-Basic hairstyle, Model , party styles and bridal styles.

UNIT – IV : Hair conditioning – Types of Hair conditioner – natural, chemical, Henna application. Hair problems and treatments –hair falling, split ends, graying, dandruff, dryness, damaged hair, Baldness, Hair spray – Types, Advantages & Disadvantages, outline of hair drier, hair ironing.

Books for References:

1. Charles Zviak, (1986), The Science of Hair Care, Taylor & Francis.
2. Dale H. Jhonson, (1997), Hair and Hair Care, Marcel Decker Inc., New York.
3. Claude Bouillon and John Wilkinson, (2005), The Science of Hair Care, Taylor & Francis. Audrey Davis Sivasothy, (2012), Hair Care Rehab, The ultimate hair repair and reconditioning manual, Saja Publishing Company, LLC.
4. Meenakshi Sinha, Reena Rajgopal, Suchismita Banerjee, (2000), All You Wanted To Know About Hair Care, Sterling Publishers Pvt. Ltd., New Delhi.

DIPLOMA COURSE IN BEAUTY & WELLNESS SEM - II

Spa Therapy and Food Diet –I Paper no:XV

Total Workload: 06 lectures per Week of 60 min.

Distribution of Workload:

 Theory: 04 Lectures per week

 Practical: 02 Lectures per week per batch of 50 students

Objective:

1. **To understand importance of spa therapy and its history.**
2. **To understand spa as a career.**

Units Prescribed for Theory: **Marks: 50**

UNIT- I : Introduction to anatomy and physiology-Elementary knowledge of various system of the body- circulatory, nervous, skeletal, muscular, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems.

UNIT– II : History and introduction to SPA, Types of SPA, Introduction to complementary SPA therapies – Acupressure, Acupuncture, Colon therapy, Chinese medicine, Ear Candling, electropathy, Gem therapy, Herbalism, Homeopathy, Naturopathy, Physiotherapy, Reiki, Tibetan Medicine, Introduction to Med SPA treatments like Botox, Fillers, Liposuction etc.

UNIT – III : SPA products and knowledge – Licensing (Drug Control), Product Testing, Efficacy, Shelf Life, Storage, Contamination and Allergies of Herbs, Essential Oils, Aromatic Oils, Body Scrubs, Body Wraps, Facial Products, Preservatives, Active Ingredients, Carrier Oil & Base Creams, Pre blended oils, Pre Blended creams, Soaps, Shampoos, lotions.

UNIT – IV : SPA as a career – basic requirements, remuneration/earning, SPA career options, starting own SPA business, job opportunities in India and Abroad, roles and responsibilities of SPA therapist.

Definition of yogasana, Importance and is role in beauty care .Healthy food recipes to Achieve healthy skin, Food for glowing skin, How to prevent age spots, Home remedies for age spots , various tips for beauty care to skin, face, hand, legs, body and hair. Beauty care during weather changes- winter, spring, summer, and autumn.

Books for References:

1. Ross and Wilson, Anatomy and physiology, ISBN 0443-03530-X.
2. Jane Crebbin-Bailey, John Harcup and John Harrington (2005), The Spa Book: The Official Guide to Spa Therapy (Hairdressing and Beauty Industry Authority), Thomson learning,
 London.
3. Steve Capellini, (2009), The Complete Spa Book for Massage Therapists, Cengage Learning
 Publishers.
4. Gerry Bodeker (Editor), Marc Cohen (Editor), (2008), Understanding the Global Spa Industry:Spa Management, Butterworth Heinemann Publishers, USA.

PRACTICAL – III - SKIN CARE, FACIAL AND HAIR CARE
Paper No : XVI

Total Workload: 06 Lectures per week of 60 min

Distribution of Workload:

 Theory: 04 Lectures per week

 Practical: 02Lectures per week per batch of 50 student

Marks 50

1. Facial-Types of facial (pearl, fruit, golden, silver. Home-made facial).

2. Bleaching.

3. Face pack and Face Massage.

4. Pimple Treatment.

5. Under eye treatment.

6. Pigmentation.

7. Mature skin.

8. Shampooing

9. Basic haircuts

10. Hair setting

11. Henna application.

12. Dye application.

13. Hair coloring

DIPLOMA COURSEIN BEAUTY & WELLNESS SEMESTER - II

PRACTICAL – IV- ADVANCED BEAUTY CARE

Paper No : XVII

Total Workload: 06 Lectures per week of 60 min

Distribution of Workload:

   Theory: 04 Lectures per week

   Practical: 02Lectures per week per batch of 50 student

Marks 50

1. Hair treatment-Hair fall,   Dandruff.

2. Hair curl.

3. Hair straightening.

4. Body massage.

5.   SPA therapy.

6. Make up- simple, party, oily, bridal.

7.   Basic Corrective make up-for cheeks, lips, and jaw.

8. Make up removal.

9. Bindi deigning.

10. Saree draping-any 3 styles.

DIPLOMA COURSEIN BEAUTY & WELLNESS SEMESTER - II

Lab Work of Project / Industrial Visit / Study Tour

Paper No :XVIII

Total Workload: 06 Lectures per week of 60 min

Distribution of Workload:

    Theory: 04 Lectures per week

    Practical: 02Lectures per week per batch of 50 student

Marks 50

Objectives:

The student will undertake a project work on the topic assigned by the concern guide consultation with the department on the various issues problem themes case studies and site visit. The project report will be 50 marks which would be assessed by the internal guide.

SHIVAJI UNIVERSITY, KOLHAPUR

Accredited By NAAC with 'A' Grade

**Faculty of Interdisciplinary Studies
Structure, Scheme and Syllabus for
Bachelor of Vocation (B. Voc.)**

Food Processing Technology
Part I- Sem. I & II

CBCS PATTERN
Syllabus to be implemented from

(Subject to the modifications that will be made from time to time)
Syllabus to be implemented from June, 2020 onwards.

SHIVAJI UNIVERSITY, KOLHAPUR
STRUCTURE AND SYLLABUS OF B.VOC.
Bachelor of Vocation (B.Voc.) – Food Processing Technology

TITLE : B.Voc. (Food Processing Technology)
Syllabus (Semester Pattern)
Under Faculty of Interdisciplinary Studies

YEAR OF IMPLEMENTATION : Syllabus will be implemented from August, 2020

DURATION : B. Voc. Part I, II and III (ThreeYears)
B. Voc. Part I - Diploma (One Year)
B. Voc. Part II - Advanced Diploma (Second Year)
B. Voc. Part III – Degree (ThirdYear)

PATTERN OF EXAMINATIOM : Semester Pattern
· **Theory Examination** - At the end of semester as per Shivaji University

Rules

· **Practical Examination** - i) In the1st, 3rdand 5thsemester of B.Voc. there will

be internal assessment of practical record, related

report submission and project reports at the end
of semester

ii) In the second semester of B. Voc. I, there will

be internal practical examination at the end of
semester

iii) In the 4thand 6thsemester of B. Voc. there will

be external practical examination at the end of
semester

MEDIUM OF INSTRUCTION : English/ Marathi.

STRUCTURE OF COURSE : B. Voc. Part – I, II and III.
Two Semester Per Year, Two General Papers per

year / semester Three Vocational Papers per

Year
/ Semester Three Practical papers per Year /
Semester.

SCHEME OF EXAMINATION :
   A) THEORY-
   · The theory examination shall be at the end of the each semester.

   · All the general theory papers shall carry 40marks and all vocational
   theory papers
shall carry 50marks.
   · Evaluation of the performance of the students in theory shall be on the
   basis of
semester examination as mentioned above.
   · Question paper will be set in the view of entire syllabus preferably
   covering each
unit of the syllabus.

   · **Nature of question paper for Theory examination** (Excluding Business
   Communication Paper)
     i) There will be seven questions carrying equal marks.

     ii) Students will have to solve any five questions

Que. No. 1 : Short answer type question with internal choice (Two out of

Three)

Que. No. 2 to Que. No. 6: Long answer type questions.

Que. No. 7 : Short Notes with internal choice (Two out of Three)

B) PRACTICALS :
     Evaluation of the performance of the students in practical shall be on
the basis of semester examination. Internal assessment at the end of
Semester I, II and III and V and external examination at the end of
Semester IV and VI as mentioned separately in each paper

Standard of Passing:
As per the guidelines and rules for B. Voc. (Attached Separately – Annexure I)

Eligibility Criteria:
   1. The Eligibility for admission is 10+2 or equivalent, in any stream
     (Arts/Commerce/Science) from any recognized board or University.

2. The candidates after with 10+2 year ITI course/ in any branch/trade also
eligible for course.
3. The candidates graduate from any faculty or engineering degree/diploma
holders are also eligible.

Structure of the Course:
B. Voc. –I (Diploma) Semester –I

Sr. No.	Paper No.	Title	Theory/ Practical /Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
	A	**General Education Components**						
1	I	Business Communication- I	Theory / Practical	50	40	10	3	2
2	II	Fundamentals of Food Science - I	Theory / Practical	50	40	10	3	2
	B	**Skill Development Components**						
3	III	Principles of Food Preservation	Theory	50	50	--	3	--
4	IV	Fundamentals of Food and Nutrition	Theory	50	50	--	3	--
5	V	Agro Processing - I	Theory	50	50	--	3	--
	C	**Laboratory Work**						
6	VI	Principles of Food Preservation	Practical	50	--	50	--	3
7	VII	Fundamentals of Food and Nutrition	Practical	50	--	50	--	3
8	VIII	Agro Processing	Practical	50	--	50	--	3
	D	**Field Work**						
9	IX	Project/ Industrial Visit /Nursery visit/ Study Tour		50	--	50	--	2
	E	**Non Credit Courses**						
		Democracy, Elections and Good Governance	Theory	50	50	--	--	--

General Education Components: The subject (Department/Discipline) in which a student

takes admission

Skill Development Components:The subject closely related to a student's major subject

Non-Credit compulsory Courses: Six courses are of general nature and are compulsory

B. Voc. –I (Diploma) Semester –II

Sr. No.	Paper No.	Title	Theory/ Practical /Project	Marks (Total)	Distribution of Marks		Credits	
					Theory	Practical	Theory	Practical
	A	**General Education Components**						
1	X	Business Communication- II	Theory / Practical	50	40	10	3	2
2	XI	Fundamentals of Food Science – II	Theory / Practical	50	40	10	3	2
	B	**Skill Development Components**						
3	XII	Food Biochemistry	Theory	50	50	--	3	--
4	XIII	Food Microbiology	Theory	50	50	--	3	--
5	XIV	Agro Processing – II	Theory	50	50	--	3	--
	C	**Laboratory Work**						
6	XV	Food Biochemistry	Practical	50	--	50	--	3
7	XVI	Food Microbiology	Practical	50	--	50	--	3
8	XVII	Agro Processing	Practical	50	--	50	--	3
	D	**Field Work**						
9	IX	Project/ Industrial Visit /Nursery visit/ Study Tour		50	--	50	--	2
	E	**Non Credit Courses**						
		Democracy, Elections and GoodGovernance	Theory	50	50	--	--	--

General Education Components: The subject (Department/Discipline) in which a student takes admission

Skill Development Components:The subject closely related to a student's major subject

Non-Credit compulsory Courses: Six courses are of general nature and are compulsory

Scheme of Teaching: B. Voc. – Part I (Diploma) Semester – I

Sr. No.	Paper No.	Title	Distribution of workload (Per Week)		
			Theory	Practical	Total
1	I	Business Communication- I	4	2	6
2	II	Fundamentals of Food Science – I	4	2	6
3	III	Principles of Food Preservation	4	-	4
4	IV	Fundamentals of Food and Nutrition	4	-	4
5	V	Agro Processing – I	4	-	4
6	VI	Laboratory Work- Principles of Food Preservation	-	4	4
7	VII	Laboratory Work- Fundamentals of Food and Nutrition	-	4	4
8	VIII	Laboratory Work-Agro Processing-I	-	4	4
9	IX	Project/ Industrial Visit	-	-	-
		Democracy, Elections and GoodGovernance	-	-	-
			20	16	36

Scheme of Teaching: B. Voc. – Part I (Diploma) Semester – II

Sr. No.	Paper No.	Title	Distribution of workload (Per Week)		
			Theory	Practical	Total
1	X	Business Communication- II	4	2	6
2	XI	Fundamentals ofFood Science – II	4	2	6
3	XII	Food Biochemistry	4	-	4
4	XIII	Food Microbiology	4	-	4
5	XIV	Agro Processing – II	4	-	4
6	XV	Laboratory Work- Food Biochemistry	-	4	4
7	XVI	Laboratory Work- Food Microbiology	-	4	4
8	XVII	Laboratory Work- Agro Processing-II	-	4	4
9	XVIII	Project/ Industrial Visit.	-	-	-
		Democracy, Elections and GoodGovernance	-	-	-
			20	16	36

Eligibility for Admission : 10 + 2 from any faculty or equivalent

Diploma
/Advanced Diploma in any related stream

Eligibility for Faculty : M. Sc. (Food Science and Nutrition / Food Processing/Food Science and

Technology/Home-
Science/ FoodScience and QualityControl

with NET
/ SET
M. Tech. (Food Tech./Food processing)

M. A (English) with NET/SET for Business Communication

Eligibility for Laboratory Assistant: B. Tech (Food Tech./ Food processing)/B. Sc.

(Food Science and Nutrition / Food Processing/
FoodScience and Technology/Home-Science/ Food
Science andQuality Control)/ B.A. Home Science.

Staffing Pattern : In 1stYear of B. Voc. - 1 Full Time and 1 Part Time

Lecturer and 1 CHB Lecturer for Business Communication

Laboratory Assistant : For 1stYear of B. Voc. - 1 Part-time

B. Voc. Part – I, Semester – I
Food Processing Technology
Paper – I: Business Communication-I

Distribution of Workload: **Total Marks**: 50
Marks
     Theory   : 04 lectures per week   Theory
40M
     Practical   : 02 lectures per week per batch   Practical
10M
     Total Workload: 06 lectures per week of 60min.

Unit–I: Use of English in Business Environment.
     BusinessVocabulary:Vocabularyforbanking,marketingandformaintaining
Publicrelations.
     What is a sentence? Elements of a sentence.
     Types of sentence: Simple, compound, complex

Unit- II: Writing a Letter of Application and CV/Resume
     Structureofaletterofapplicationforvariousposts CV/Resume and
itsessentials

Unit - III: Presenting Information / Data.
     Presentinginformation/datausinggraphicsliketables,pie
charts,treediagrams, bar
     diagrams, graphs, flowcharts

Unit - IV: Interview Technique

      Dos and don'ts of an interview preparing for an interviewPresenting documents

      Language used in an interview

Practical: Based on the theory units: Marks: 10

Reference Books:

   • Sethi, Anjanee&BhavanaAdhikari. *Business Communication.* New Delhi: TataMcGrawHill

   • Tickoo, Champa& Jaya Sasikumar. *Writing with a Purpose.*
NewYork: OUP, 1979.

   • Sonie, Subhash C. *Mastering the Art of Effective Business Communication.*
New Delhi: Student Aid Publication,2008.

   • Herekar, Praksh. *Business Communication.* Pune: Mehta Publications, 2007.

   • Herekar, Praksh. *Principals of Business Communication.*Pune: Mehta Publi. 2003

Pattern of a Question paper
Business Communication –I
Semester –I paper-I

Time : 2 hours   **Total Marks:40**

 Q.1 Do as directed questions items on unit 1 to be asked   10 (10out of 12)

 Q.2 Write a letter of application   10

        OR

Draft a CV / Resume for a particular post   10

Q.3 Present a given information or a data using a table/ chart/piedigaram,etc. 10

    (any one diagram to be drawn)

Q.4 Fill in the blanks in the given interview   10

Practical Evaluation:

Oral and presentation based on units prescribed   **10**

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester – I
Food Processing Technology
Paper – II: Fundamentals of Food Science - I

Distribution of Workload: **Total Marks**: 50
Marks
      Theory   : 04 lectures per week   Theory
40M
      Practical   : 02 lectures per week per batch   Practical
10M
      Total Workload: 06 lectures per week of 60min.

Objectives:
      • To understand the basic concept, functions, and classification of food.
      • Tofamiliar with different methods of cooking

Unit–I: Introduction to food science
Concept of food, food science, Objectives of food science, Functions of food.

Unit –II: Classification of food
According to food science basic five food groups, Selection of food

Unit–III: Methods of cooking
Traditional cooking methods, Modern cooking methods, Objectives and importance of cooking

Unit –IV: Food Preparation and storage
Basic terms used in food preparation, Pre-preparation for cooking, Storage of raw and cooked food.

Reference Books:

1. B. Shreelaksmi.*Food Science*(second edition), New Age International, New Delhi.
2. Swaminathan. *Text book of Food Science*Vol-1, BAPPCO, Banglore
3. Devendrakumar Bhatt & Priyanka Tomar.*An Introduction to FoodScience,*

Technology & Quality Management. Kalyani Publishers
4. Sumati R. Mudambi. *Fundamentals of Food & Nutrition*, Wiley Eastern
   Ltd.,New
                    Delhi

Fundamentals of Food Science

Laboratory work

Total Marks: 10

1. Introduction to laboratory rules.

2. Equipments used in cooking.

3. Terms used in cooking.

4. Weights and Measures of raw and cooked food.

5. Methods of cooking.

   1) Traditional methods – Preparation of any two recipes from thefollowing:

      a) Boiling b) Roasting c) Frying d) Steaming

   2) Modern methods - Preparation of any two recipes from the following:

      a) Baking b) Solar c) Microwave d) Combination

Scheme of Internal Practical Evaluation **10 marks**

1) Submission of Record book   5 marks
2) Viva – Voce   5 marks

SHIVAJI UNIVERSITY, KOLHAPUR

B. Voc. Part – I, Semester -I

Food Processing Technology

Paper - III: Principles of Food Preservation

Distribution of Workload: **Total Marks**: 50
Marks
      Theory   : 04 lectures per week
      Total Workload**:** 04 lectures per week

Objectives:
• To enable the students to acquire knowledge on different preservation techniques used to
enhance the shelf span of food product.
• To study the different mode of spoilage in foods and minimize the contamination by
different preservation technology.

Unit– I: Basic Principles of Food Preservation
Definition, principles and importance of food preservation, general classification on the
methods of food preservation, class I and class II preservatives, combination of preservatives,preservation by irradiation and fermentation.

Unit - II: Thermal processing methods of preservation
Principle and equipments: Canning, blanching, pasteurization, sterilization, evaporation, etc.
Need and principle of concentration, methods of concentration – Thermal concentration, freeze concentration, membrane concentration, changes in food quality by concentration.
Food preservation by use of low temperature – Principle, equipments and effect on quality (Chilling, cold storage, freezing etc.)

Unit -III: Preservation by Removal of Moisture
Drying and dehydration-merits and demerits, factors affecting drying, preparation of food for drying, Freeze drying, dehydrofreezing-advantages, mechanism of freeze drying and
dehydrofreezing, Concentration, principles and types of concentrated foods.

Unit -IV: Preservation by radiation, chemicals and preservatives
Definition, methods ofirradiation, direct and indirect effect, measurement of radiation dose, dosedistribution, effect on microorganisms. Deterioration of irradiated foods- physical,
chemical and biological, effects on quality of foods. Preservation of foods bychemicals: antioxidants, mold inhibitors, antibodies, acidulants
etc.Preservation by fermentation- Definition, advantages, disadvantages, types, equipments

Reference Books:

1. MC.Williams, M and Paine, H.(1984). *Modern Food preservation*Surjeet Publications,
Delhi.
2. Potter, N.N. and Hotchkiss J. H.(1996). *Food Science*.CBS publishers and distributors
3. Srilakshmi, B..(2003). *Food Science* New Age International Publishers, New Delhi
4. Srivastava, R.PO and Kumar, S..(1994). *Fruit and vegetable preservation*International Bookdistribution Company, Lucknow
5. Subalakshmi, G and Udipi, S.A.. (2001). *Food processing and preservation*New Age
International Publishers, New Delhi.
6. Tomar, Gajendra Singh. (2010). *Agronomy Basics and Applied*. Satish Serial Publishing
House, Azadpur, New Delhi.

Food Processing Technology
Paper-IV: Fundamentals of Food and Nutrition

Distribution of Workload: **Total Marks**: 50
Marks
  Theory   : 04 lectures per week
  Total Workload**:** 04 lectures per week

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Objectives:
• To understand the importance of nutrient in our daily diet.
• To formulate nutritionally enriched food products as perthe requirement.

Unit- I: Basic concept of Food and Food constituents
Basic concept of Food: Nutrient, Nutrition, Classification of Food,
Classification of
Nutrients.
Food constituents - Definition, occurrence, properties and metabolism of
Protein,
Carbohydrate and Lipids.

Unit-II: Enzymes and Biochemical changes in food
Enzymes - Definition, classification, enzyme kinetics.
Browning reactions in foods:
i. Non enzymic browning: Maillard reaction, browning of ascorbic acid,
caramelization of sugars.
ii. Enzymic browning: Definition, mechanism, control measures.
Biochemical changes in foods of plant and animal origin: fruits, vegetables,
cereals,
pulses, oilseeds, meat, poultry, seafood, dairy and their products

Unit-III: Concept of food and nutrition
Concept of food and nutrition - Elements of nutrition, Food groups and role
ofnutrients. Energy metabolism – BMR
Recommended dietary allowances, Balanced diet for different age groups
(Infancy to old
age).

Unit– IV: Malnutrition
Malnutrition-Causes, types, symptoms and prevention, Assessment of
nutritional status of
the community, National nutrition policy

Reference Books:
1. Gillespie S, McLachlan M, Shrimpton R, editors. (2003). *Combating malnutrition: time to act.* Washington DC: World Bank.
2. Mudambi S.R., Rajagopal M.V. (2006). *Fundamentals of Foods, Nutrition and Diet Therapy.* New Age International Publishers, New Delhi
3. Shubangini A Joshi, (1998): *Nutrition and Dietetics,* Tata Mc Graw Hill Pub. Co. Ltd., New Delhi
4. Srilakshmi. B, (2005): *Dietetics,* V Edition, New Age International (P) Ltd, Publishers, Chennai.

Food Processing Technology
Paper-V: Agro Processing - I

Distribution of Workload: **Total Marks**: 50
Marks
       Theory   : 04 lectures per week
       Total Workload**:** 04 lectures per week

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Objective:
To enable students –
1) to operate processing equipments.
2) to produce different agro products.

Unit- I: Agro processing industry
- Introduction to Agro processing industry.
- Scope and importance of Agro processed products.

Unit - II: Machinery in Agro processing
Processing equipments – Floor mill, mini grain millpulverizers, Hammer mill,
Floor separator, Dal mill, Packingand Sealing machine, Balance.

Unit - III: Cereal grain – wheat and corn
- Different grains suitable for agro processing.
- Primary processing of wheat - cleaning, grading, milling
- Standards for wheat products.
- Production of wheat products.
- Dry milling, wet milling, Pop corn and corn flakes.

Unit - IV: Rice milling
- Properties of padding for rice milling
- Process of rice milling
- Hullers for rice milling.

Reference Books:
1. Yoginder K Alagh : Scope for Agro processing in India, Ajanta Publication.
2. Agro Based and Processed Food Products, New Delhi.
3. Niir Board : Modern Technology of Agro processing and Agricultural waste, NationalInstitute of India Re 2000

Food Processing Technology
Paper-VI Principles of Food Preservation
Laboratory work

Total Workload: 04   **Total Marks:** 50
Marks
         Practical - 04 lectures/week/ Batch

Objectives:
·To study the different mode of spoilage in foods and minimize the contamination by
different preservation technology

Practicals:
       1. Demonstration on canning and bottling of fruits and vegetables.
       2. Preservation of food by high concentration of sugar i.e. preparation of jam.
       3. Preservation of food by using salt e.g. Pickle.
       4. Preservation of food by using acidulants i.e. pickling by acid, vinegar or acetic
          acid.
       5. Preservation of food by using chemicals.
       6. Demonstration on drying of green leafy vegetables.
       7. Demonstration of preserving foods under cold v/s freezing process.
       8. Visit to any food processing industry/unit.

Scheme of practical evaluation

Internal practical examination

50 marks

i)Preparation of any product

15 marks

ii) Submission of practical record book

15 marks

iii) Submission of visit report   10

marks

iv) Viva – Voce   10

marks

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester -I
Food Processing Technology
Paper-VII Fundamentals of Food and Nutrition
Laboratory work

<mark>**Total Workload:** 04</mark>   **Total Marks:** 50
<mark>Marks</mark>
<mark>Practical - 04 lectures/week/ Batch</mark>

Objectives:
·Student will enable to formulate nutritionally enriched food products as
perthe requirementmethods.

Practicals:

1.<mark>Estimation of fructose by Rescorcinol method</mark>

2.Estimations of amino acids in foods.

3. <mark>Estimation of vitamin from food sample</mark>.

4. Determination of auto oxidative rancidity of fat and oils.

5. Calculation of BMR and body surface area.

6Calculation of energy value of food.

7. Planning and calculation of nutritive value of balanced diet for

different age

   groups.

8. Computation of energy requirement on the basis of physical activity.

Scheme of practical evaluation

Internal practical examination

50 marks

i)Preparation of any product

15 marks

ii) Submission of practical record book

15 marks

10

marks

iv) Viva – Voce 10

marks

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester -I
Food Processing Technology
Paper-VIII Agro Processing
Laboratory work

Total Workload: 04   **Total Marks:** 50
Marks
        Practical - 04 lectures/week/ Batch

Objectives:
·To buildthe knowledge about the importance and production technology of cut flowers.

Practical

1. Physical analysis of grains.

2. Cleaning, grading and other pre-processing activities of grains.

3. Production of whole wheat flour.

4. Estimation of gluten content.

5. Flour Analysis.

6. Starch Estimation.

7. Angle of Repose.

8. Visit to Rice Mill.

Scheme of practical evaluation

Internal practical examination

50 marks

i)Preparation of any product

15 marks

ii) Submission of practical record book

15 marks

iii) Submission of visit report   10

marks

iv) Viva – Voce   10

marks

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester -I
Food Processing Technology
Paper-IX: Project/ Industrial Visit

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Total Marks: 50 Marks.

Project planning and scheduling, project report submission and the viva-voce examinations.The industrial/field training shall be evaluated through the quality of workcarried out, the report submission and presentation(s). This work should be completed within a span of year.

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Food Processing Technology
Paper – X: Business Communication-II

Distribution of Workload:	**Total Marks**: 50

Marks
     Theory   : 04 lectures per week   Theory
40M
     Practical   : 02 lectures per week per batch   Practical
10M
     Total Workload: 06 lectures per week of 60min.

UNIT –I: Group Discussion
Preparing for a Group DiscussionInitiating a DiscussionEliciting Opinions,
views etc. Expressing Agreement /DisagreementMaking Suggestions;
Accepting and Declining SuggestionsSummingup**.**

UNIT –II: Business Correspondence
WritingMemos, e-mails, complaints,inquiries,etc.
Inviting Quotations Placing Orders, Tenders, etc

UNIT –III: English for Negotiation
Business Negotiations Agenda for Negotiation Stages of Negotiation

UNIT –IV: English for Marketing
Describing/ExplainingaProduct/Service Promotion of aProduct
Dealing/ bargaining with Customers
MarketingaProduct/Service:UsingPamphlets,Hoardings,
Advertisement, Public Function/Festival

Practical: Based on the theory units: Marks:
10

Reference Books:

•Herekar, Praksh (2007). *Business Communication.*Mehta Publications, Pune.
•Herekar,Praksh (2003).*PrincipalsofBusinessCommunication.*Mehta
Publications, Pune
• John, David. *Group Discussions.*Arihant Publications, New Delhi.
•
Kumar,Varinder(2000).*BusinessCommunication.*KalyaniPublishers,NewDelhi.
•Pardeshi,P.C.(2008). *ManagerialCommunication.*NiraliPrakashan,Pune.
• Pradhan, N. S.(2005).*Business Communication.* Himalaya Publishing House,
Mumbai.
• Rai, Urmila& S. M. Rai.(2007). *BusinessCommunication.*Himalaya Publishing
House, Mumbai

•Sethi,A.&B. Adhikari.*BusinessCommunication*.TataMcGrawHill.NewDelhi.
•Sonie,SubhashC.(2008) *MasteringtheArtofEffectiveBusinessCommunication*, Student Aid Publication,NewDelhi.
•Tickoo, Champa& Jaya Sasikumar (1979).*Writing with a Purpose.* OUP,New York.
• Whitehead,Jeoffrey&DavidH.Whitehead.(1996) *BusinessCorrespondence.*Wheeler
Publishing, Allahabad.

Pattern of a Question paper
Business Communication –II
Semester –II paper-X

Time : 2 hours   **Total Marks:40**

Q.1 Do as directed questions items on unit 1 to be asked   10 (10out of 12)

Q.2 Write a letter of application   10

       OR

Draft a CV / Resume for a particular post   10

Q.3 Present a given information or a data using a table/ chart/piedigaram,etc. 10

      (any one diagram to be drawn)

Q.4 Fill in the blanks in the given interview   10

Practical Evaluation:

Oral and presentation based on units prescribed   **10 Marks**

SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester – II
Food Processing Technology
Paper – XI: Fundamentals of Food Science - II

Distribution of Workload: **Total Marks**: 50 Marks

      Theory   : 04 lectures per week   Theory 40M

      Practical   : 02 lectures per week per batch   Practical 10M

      Total Workload: 06 lectures per week of 60min.

Objectives:
•To understand the basic concept of various cookery.
•To become familiar with preparation of various cookery.

UNIT –I: Cereal cookery
- Structure, composition and Importance of cereal grains
- Types of cereals used in cooking
- Cereal cookery- Gelatinization, Dextrinization and Identityof grain
- Processed cereals, millets and Ready-To- Eat cerealsused in cooking

UNIT –II: Pulse and Legume Cookery
- Definition, composition and structure of pulses
- Cooking of Legumes
- Factors Affecting cooking time of pulses and legumes
- Uses of legumes in cookery

UNIT –III: Nuts and Oil seeds Cookery
- Types and composition of Nuts and Oil seeds
- Toxic substances in Nuts and Oil seeds
- Changes during cooking and storage
- Function of Nuts and Oil seeds in cookery

UNIT –IV:Fruits and Vegetables Cookery
- Classification of Fruits and vegetables
- Colour pigments in Fruits and vegetables.
- Effect of heat, acids and alkali on Fruits and vegetables.
- Changes during cooking and storage.

Reference Books:
1. B. Shreelaksmi.*Food Science*(second edition), New Age International, New Delhi.
2. Swaminathan. *Text book of Food Science*Vol-1, BAPPCO, Banglore
3. Devendrakumar Bhatt & Priyanka Tomar.*An Introduction to FoodScience, Technology & Quality Management*. Kalyani Publishers
4. Sumati R. Mudambi. *Fundamentals of Food & Nutrition*, Wiley Eastern Ltd.,New
Delhi.

Fundamentals of Food Science - II (Practical) Marks: 10

1Preparation of product by Gelatinization.
2.Preparation of product by Dextrinization.
3.Preparation of product by Germinated pulses.
4.Preparation of product by milled pulses.
5.Preparation of product by nuts and oilseeds.
6. Preparation of product by green leafy vegetable.
7. Preparation of product by roots and tuber.
8. Preparation of product by fruits.

Scheme of Internal Practical Evaluation **10 marks**

1) Submission of Record book   5 marks

2) Viva – Voce   5 marks

Total Workload: 04   **Total Marks:** 50
Marks
     Theory - 04 lectures/week/ Batch

Objectives:
•To learn and understand the chemistry with respect to role and functionality ofconstituents of the food.

UNIT –I:Introduction to Food Biochemistry
Nature scope and development of food Biochemistry, role of food chemist. Moisturein foods.
    i. Role and type of water in foods.
    ii. Functional properties of water, role of water in food spoilage and food safety.
    iii. Water activity and sorption isotherm.

UNIT –II:Carbohydrates and Vitamin
Classification, structure and function of carbohydrates.Functional characteristics of different carbohydrates, browning Reactions, modification of carbohydrates, Dietary fibers NDF, ADF, Cellulose, hemicellulose, pectin and carbohydratesdigestibility.
vitamin i. Definition of vitamin, type of vitamin,
    ii. Water soluble (Vit B-1, B-2, B-3, C) and Fat soluble (Vit A, D, E, K)- their
    structure and functions

UNIT –III: Protein in Food
Role of proteins in foods.Classification and structural organization of proteins.Physicochemical properties, protein content and composition in various foods, functional properties of proteins in foods. Effects of processing on functional properties of proteins, unconventional sources of proteins.

UNIT –IV: Lipids in food
Role and use of lipids /fat, occurrence, fat group classification. Physicochemical aspects of fatty acids in natural foods, hydrolysis, reversion, polymorphism and its application. Chemical aspects of lipolysis, auto oxidation, antioxidants. Technology of fat and oil processing
a. Refining
b. Hydrogenations
c. Inter esterification

Reference Books:
• Garrett, R.H., Grisham, C.M. (1999).*Biochemistry*. 2ⁿᵈedition, Saunders college publishing, India.

- David, L, Nelson and Cox,M.M. (2005). *Lehninger: Principles of Biochemistry,*4th edition, Maxmillan/Worth publishers/W.H. Freeman and Company.
- David Rawn, (2004). *Biochemistry*, Panima, Publishing Corporation, New Delhi.
- Donald Voet, Judith G,and other (2006). *Fundamentals of Biochemistry,*2nd edition,John Wiley and Sons, INC.

Total Workload: 04   **Total Marks:** 50

Marks

      Theory - 04 lectures/week/ Batch

Objectives:
•Students will develop knowledge and understanding of different foodmicroorganisms and different techniques used in its detection.

UNIT –I: Introduction to Food Microbiology
Introduction- definition, history of microbiology of food. Types ofmicroorganisms normally associated with food- bacteria, yeast and moulds.Spoilage of food; factorsaffecting spoilage of foods and associated microflora.Biochemical changes caused by microorganisms- putrefaction, lipolysis, etc.

UNIT –II:Factors affecting growth and survival of microorganisms
Extrinsic factors- relative humidity, gaseous atmosphere.Intrinsic factors- nutrient content, water activity, oxidation reduction potential.Sources of contamination. Contamination of food-stuff, vegetables, fruits,cereals, pulses, oilseeds, milk and meat during handling and processing.

UNIT –III:Deterioration and spoilage of various types of food products
Fruits, vegetables, cereal and cereal products, meat and meat products, fishand other sea foods. Prevention of spoilage of these foods.

UNIT –IV:Food borne infections and food poisoning
Bacterial with examples of infective and toxic types- *Clostridium, Salmonella,Shigella, Staphyllococci, Compilobacter, Escerichia, Bacillu etc.*Mycotoxins in food with reference to Aspergillus species. Protozae.Prevention of food borne diseases.

Reference Books:
*   Adams, M.R. and Moses M.G. (1995): *Food Microbiology*. 1st edition, New Age International (P) Ltd.
*   Bibek Ray (2005). *Fundamental Food Microbiology*.2$_{nd}$edition,CRC Press, Boca Raton London New York Washington.
*   Frazier W C., (2002): *Food Microbiology*, Mc Graw Hill Book Co., 6th edition, New Delhi.
*   Jay, James, M (2000): *Modern Food Microbiology*, 2nd edition, CBS Publisher.
*   Pelezar, M.I and Reid, R.D, (1993): *Microbiology*, 5th edition, McGRaw Hill Book Company,New York.

Food Processing Technology
Paper XIV: Agro Processing-II

Total Workload: 04   **Total Marks:** 50
Marks
       Theory - 04 lectures/week/ Batch

Objectives:
•To understand the processing techniques of agro products.
•To know the use of agro processing equipments.

UNIT –I:Pulses and Legumes processing
- Principles of pulse milling
- Different methods of Dhal milling
- Milling of specific legumes- Red gram, Chickpea

UNIT –II: Oil seeds Processing
- Properties and suitability of oil seeds for processing
-Methods of oilseed processing
-Terminologies in oil processing industry

UNIT –III: Processing of plantation crops
- Concept of plantation crops
- Principles of processing of plantation crops
- Processing of tea, coffee, cocoa and coconut

UNIT –IV: Spice processing
- Spices suitable for processing
- Principles and methods of spice processing
- Machinery used for spice processing
- Quality aspects of spices

Reference Books:
- Kader A A: *Post Harvest Technology of Horticultural Crops*. 2nd edition, University of
California
- Niir Board (2000) : *Modern Technology of Agro processing and Agricultural waste*, National Institute of India
- Salunkhe D K, Chavan J K, Adsule R N and Kadam S S : *World Oilseeds Chemistry,*
Technology and Utilization. VNR, New York

Food Processing Technology
Paper-XV: Food Biochemistry
Laboratory work

Total Workload: 04   **Total Marks:** 50
Marks
      Practical - 04 lectures/week/ Batch

Objectives:
• To learn the chemistry with respect to role and functionality ofconstituents of the food.

Practicals:
1. Determination of moisture in food sample.
2. Determination of protein in food sample.
3. Determination of ash/minerals in food sample.
4. Determination of crude fat in food sample.
5. Determination of acidity & pH in food sample/beverages.
6. Determination of total, non-reducing and reducing sugars.
7. Determination of vitamin C content in food sample.
8. Determination of pigments in food sample
9. Estimation of calcium, iron and zinc in food products.

Scheme of practical evaluation

Internal practical examination

50 marks

i)Preparation of any product

15 marks

ii) Submission of practical record book

15 marks

iii) Submission of visit report   10

marks

iv) Viva – Voce   10

marks

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Food Processing Technology
Paper-XVI: - Food Microbiology
Laboratory work

Total Workload: 04   **Total Marks:** 50

Marks

Practical - 04 lectures/week/ Batch

Objectives:
- To understanding of different food microorganisms and different techniques used in its detection.

Practicals:
1. Study of compound microscope.
2. Cleaning and sterilization of glassware.
3. Preparation of nutrient broth, potato dextrose and nutrient agar media.
4. Pure culture techniques(Streak plate and pour plate).
5. Gram staining and study of morphology of bacterial cell.
6. Microbial examination of table containers and packaging materials.
7. Assessment of quality of raw milk by MBRT.
8. Bacteriological analysis (*Coliform* count) of water by MPN method.
9. Estimation of *Salmonella* from food sample.
10. Estimation of *Staphylococcus* from food sample.

Scheme of practical evaluation

Internal practical examination

50 marks

i)Preparation of any product

15 marks

ii) Submission of practical record book

15 marks

<mark>iii) Submission of visit report</mark>   10

marks

iv) Viva – Voce   10

marks

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester -II
Food Processing Technology
Paper-XVII: Agro Processing - II
Laboratory work

Total Workload: 04   **Total Marks:** 50
Marks
        Practical - 04 lectures/week/ Batch

Objectives:
• To understand the processing techniques of agro products.

Practicals:
        1.Preparation of soy milk.

        2.Preparation of soy curd.

        3.Preparation of Tofu.

        4.Preparation of Pulse flour of different granule size.

        5. Preparation of Peanut butter.

        6. Preparation of Garlic paste.

        7. Preparation of Coconut Chips.

        8. Visit to Spice Industry/Pulse Mill.

Scheme of practical evaluation

Internal practical examination

50 marks

i)Preparation of any product

15 marks

ii) Submission of practical record book

15 marks

iii) Submission of visit report   10

marks

iv) Viva – Voce   10

marks

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SHIVAJI UNIVERSITY, KOLHAPUR
B. Voc. Part – I, Semester -II
Food Processing Technology
Paper-XVIII: Project/ Industrial Visit

Total Marks: 50
Marks.

Project planning and scheduling, project report submission and the viva-voce examinations.The industrial/field training shall be evaluated through the quality of work carried out, the report submission and presentation(s). This work should be completed within a span of year.

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