M.V.P. SAMAJ's

Karmaveer Shantarambapu Kondaji Wavare Arts, Science and Commerce College, CIDCO, Nashik

(Internal Quality Assurance Cell)

Program Outcomes (POs), Program Specific Outcomes (PSOs) and Course Outcomes (COs)

(2021-2022)

PROGRAM OUTCOME
Faculty of Arts

Program Outcomes (POs) for B.A Programme

PO1:	**Disciplinary Knowledge:** Demonstrate a blend of conventional discipline knowledge and its applications to the modern world. Execute strong theoretical and practical understanding generated from the chosen programme.
PO2:	**Critical Thinking and Problem solving:** Exhibit the skill of critical thinking and use higher order cognitive skills to approach problems situated in their social environment, propose feasible solutions and help in its implementation.
PO3:	**Research-Related Skills:** Seeks opportunity for research and higher academic achievements in the chosen field and allied subjects and is aware about research ethics, intellectual property rights and issues of plagiarism. Demonstrate a sense of inquiry and capability for asking relevant/appropriate questions; ability to plan, execute and report the results of an research project be it in field or otherwise under supervision.
PO4	**Research-Related Skills:** Seeks opportunity for research and higher academic achievements in the chosen field and allied subjects and is aware about research ethics, intellectual property rights and issues of plagiarism. Demonstrate a sense of inquiry and capability for asking relevant/appropriate questions; ability to plan, execute and report the results of an research project be it in field or otherwise under supervision.
PO5	**Personal and professional competence:** Equip with strong work attitudes and professional skills that will enable them to work independently as well as collaboratively in a team environment.
PO6	**Effective Citizenship and Ethics:** Demonstrate empathetic social concern and equity centred national development; ability to act with an informed awareness of moral and ethical issues and commit to professional ethics and responsibility.
PO7	**Environment and Sustainability:** Understand the impact of the scientific solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.
PO8	**Self-directed and Life-long learning:** Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.

Program Outcomes (POs) for M.A Programme

PO1:	**Disciplinary Knowledge:** Demonstrate comprehensive knowledge and a strong theoretical grounding in their area of work.
PO2:	**Critical Thinking and Problem solving:** Identify problems by closely examining the situations around them and think holistically about the phenomena and generate viable solutions to these problems. Exhibit the skill of critical thinking and understand scientific texts and place scientific statements and themes in contexts and also evaluate them in terms of generic conventions. Identify the problem by observing the situation closely, take actions and apply lateral thinking and analytical skills to design the solutions.
PO3:	**Social competence and communication skills:** Demonstrate ability to accommodate the views of others and present their own opinions and complex ideas, in written or oral form, in a clear and concise manner in group settings. Exhibit thoughts and ideas effectively in writing and orally; communicate with others using appropriate media, build effective interactive and presenting skills to meet global competencies. Elicit views of others, present complex information in a clear and concise and help reach conclusion in group settings.
PO4	**Research-related skills and Scientific temper:** Infer scientific literature, build a sense of enquiry and be able to formulate, test, analyse, interpret and establish hypothesis and research questions; and to identify and consult relevant sources to find answers. Able to plan and write a research paper/project while emphasizing on academics and research ethics, scientific conduct and creating awareness about intellectual property rights and issues of plagiarism.
PO5	**Trans-disciplinary research competence:** Create new conceptual, theoretical, methodological innovations that integrate and transcend beyond discipline-specific approaches to address a common problem.
PO6	**Personal and professional competence:** Perform independently and also collaboratively as a part of a team to meet defined objectives and carry out work across interdisciplinary fields. Execute interpersonal relationships, self-motivation and adaptability skills and commit to professional ethics.
PO7	**Effective Citizenship and Ethics :** Demonstrate empathetic social concern and equity centred national development and act with an informed awareness of moral and ethical issues and commit to professional ethics and responsibility.
PO8	**Environment and Sustainability:** Understand the impact of the scientific solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO9	**Self-directed and Life-long learning:** Demonstrate attitudes of being a life-long learner who passionately pursues self-determined goals in the broadest context of socio-technological changes. Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.

Department of Marathi

Programme Specific Outcome (Marathi):

PSO1:	मराठी साहित्य,भाषिक कौशल्य आणि शासनव्यवहारात भाषेचा उपयोग करण्याची क्षमता विकसित होईल
PSO2:	साहित्यप्रकाराची संकल्पना समजून घेत येईल
PSO3:	साहित्यनिर्मितीच्या विवध प्रेरणा, प्रवृत्ती समजून घेता येतील.
PSO4	साहित्य व्यवहारातील व विविध साहित्य प्रकारातील भाषा रूप आणि भाषिक आविष्कार समजून घेता येतील.
PSO5	साहित्याच्या अभ्यासाने नैतिक, तात्विक आणि मानविय व्यवहाराचे भान निर्माण होईल.

Course Outcome (Marathi):

F.Y.B.Com. –127B	1) विविध क्षेत्रातील भाषा व्यवहाराचे स्वरूप समजावून घेत येईल. 2) भाषाव्यवहाराचे आणि वापराचे कौशल्य विकसित होईल. 3) नैतिक, व्यावसायिक आणि वैचारिक मूल्यांची जोपासना होईल. 4) विविध क्षेत्रातील कर्तुत्ववान आणि यशस्वी व्यक्तींच्या कार्याचा परिचय होईल.
F.Y.B.A. –11022A	1) मराठी भाषा, साहित्य आणि संस्कृतीचे अध्ययन करता येईल. 2) साहित्यविषयक आकलन ,आस्वाद आणि `मूल्यमापणाची क्षमता विकसित होईल. 3) साहित्याच्या अध्ययनातून जीवनविषयक समज वृद्धिंगत होईल. 4) मराठी भाषेची उपयोजनात्मक कौशल्ये विकसित होतील. 5) कथा या साहित्य प्रकारचा परिचय होईल.
S.Y.B.A. – 24021,23022,23023	1) कादंबरी या साहित्यप्रकाराचा परिचय होईल. 2) नेमलेल्या कादंबरीचे आकलन, आस्वाद आणि विश्लेषण करता येईल

	3) भाषिक कौशलयांचा विकास होईल. 4) संगणकाच्या विविध कौशलयांचा भाषेच्या संदर्भात परिचय होईल 5) साहित्यविचारांचा आणि सौन्दर्यवादी दृष्टीचा परिचय होईल

1. (G3) Sem: I भाषिक कौशल्यविकास आणि आधुनिक मराठी साहित्य प्रकार: प्रवास वर्णन [CC-1E(3)]

1. मुद्रित मध्यमांसाठी करावयाच्या लेखनाची कौशल्ये विकसित होतील**.**

2. **प्रवास**वर्णन या साहित्यप्रकाराचा परिचय होईल.

3. नेमलेल्या प्रवासवर्णनाचे अध्ययन करता येईल.

Sem: II भाषिक कौशल्यविकास आणि आधुनिक मराठी साहित्य प्रकार: कविता [CC-1F(3)]

1) मराठी साहित्य ,भाषिक कौशल्यविकास आणि शासन व्यवहार यांची माहिती होईल

2) कविता हा वाङमयप्रकार समजून घेता येईल.

3) कवितेची भाषा आणि तिच्या रुपाचे विविध आविष्कार समजून घेता येतील.

4) नेमलेल्या प्रातिनिधिक कवितांचा अभ्यास करता येईल.

2. (S3) Sem1 मध्ययुगीन मराठी वाड्मयाचा स्थूल इतिहास : प्रारंभ ते इ. स.1600 [DSE1 C(3+1)]

१) वाड्मय इतिहासाची संकल्पना स्वरूप, प्रेरणा प्रवृत्ती यांचा परिचय होईल

२) मध्ययुगीन कालखंडातील सामाजिक , सांस्कृतिक पार्श्वभूमी समजून घेता येतील.

३) मराठी भाषा, साहित्याचा कालखंडानुरूप इतिहास अभ्यासता येईल.

Sem II मध्ययुगीन मराठी वाड्मयाचा स्थूल इतिहास : इ. स.1600

ते इ. स.1817 [DSE1 D(3+1)]

1) वाङ्मय इतिहासाची संकल्पना स्वरूप, प्रेरणा प्रवृत्ती यांचा परिचय होईल

2) मध्ययुगीन कालखंडातील सामाजिक , सांस्कृतिक पार्श्वभूमी समजून घेता येतील.

3) मराठी भाषा, साहित्याचा कालखंडानुरूप इतिहास अभ्यासता येईल.

3. (S4) Sem1 वर्णनात्मक भाषा विज्ञान:भाग १[DSE2 C (3)+1)]

1) भाषाचे स्वरूप,वैशिष्टे व कार्यं समजून घेता येईल.
2) भाषा अभ्यासाच्या शाखा आणि अभ्यास पद्धतींचा परिचय करून घेता येईल.
3) भाषाभ्यासाचे महत्व सांगता येईल.
4) स्वनविज्ञान,स्वनिम विचार आणि मराठीची स्वनिम व्यवस्था समजून घेता येईल.
5) वागिन्द्रियाची रचना व कार्य आणि स्वन निर्मितीची प्रक्रिया समजून घेता येईल°

SemII वर्णनात्मक भाषा विज्ञान:भाग २**[DSE2D (3)+1)]**

१) रूप विन्यासआणि मराठीची रूप व्यवस्था समजून घेता येईल.

२) वाक्य विन्यास आणि वाक्य व्यवस्थेचा मराठी भाषेच्या संदर्भात परिचय समजून घेता येईल.

३) अर्थ विन्यास व्यवस्थेचाभाषा वैज्ञानिक अंगाने परिचय करून घेता येईल.

Programme Specific Outcome M.A. (Marathi):

PSO1:	पदव्युत्तर पातळीवरील विद्यार्थ्यांच्या वाङ्मयीन आणि जीवनविषयक जाणिवा समृद्ध करणे.
PSO2:	जाणिवा विकसित करुन कौशल्यात्मक उपयोजनासाठी सिद्ध करणे.
PSO3:	साहित्य कला व इतर कला यांच्या वाचनातून अभिरुची वृद्धिंगत करणे.
PSO4	लेखन कौशल्य विकसित करणे.
PSO5	वाङ्मयीन क्षेत्रांचा परिचय करून देणे.

Course Outcome M.A. (Marathi):

एम. ए. भाग १ (सत्र १ व २)	
पेपर क्र.1 भाषाव्यवहार आणि भाषिक कौशल्ये भाग १ व २ (10401,20402)	1)प्रमाणभाषा व मुद्रितशोधन विषयी माहिती प्राप्त होईल. 2)वाङ्मयीन व्यवहारासंदर्भात ज्ञान प्राप्त होईल. 3)जनसंपर्क कौशल्य विकसित होईल. 4)वाङ्मयीन प्रकल्पलेखनाचे स्वरूप समजेल. 5) मुलाखत लेखन संदर्भात अभ्यास होईल.
पेपर क्र.2अर्वाचीन मराठी वाङ्मयाचा इतिहास १८१८-२०१० (10402,20402)	1) वाङ्मयीन इतिहास विद्यार्थ्यांना समजेल. 2) आधुनिक मराठी साहित्याच्या प्रेरणा विषयी माहिती प्राप्त होईल. 3) १९२० ते २०१० पर्यंतचा साहित्याचा इतिहासाचा परिचय होईल. 4) आधुनिक कालखंडातील नवसाहित्याची विद्यार्थ्यांना माहिती प्राप्त होईल. 5) आधुनिक कालखंडातील मराठी साहित्य प्रकारांची ओळख निर्माण होईल.
पेपर क्र. 3. भाषा विज्ञान – ऐतिहासिक व सामाजिक (10403,20403)	1)भाषाविज्ञानाची संकल्पना समजेल. 2)ऐतिहासिक व भाषाविज्ञान संदर्भात माहिती प्राप्त होईल. 3)मराठी भाषा उगम व विकासासंदर्भात विद्यार्थ्यांना ज्ञान मिळेल. 4)भाषा, बोली व समाज यांच्यातील परस्पर संबंध समजून घेता येईल. 5)भाषा आणि संस्कृती यांचा परस्परसंबंध याविषयी माहिती मिळेल.

पेपर क्र. ४. ग्रामीण व दलित साहित्य (10404,20404)	1)ग्रामीण व दलित साहित्याच्या निर्मितीची कारणमीमांसा स्पष्ट होईल. 2)ग्रामीण व दलित साहित्याच्या साहित्य प्रकारांची ओळख होईल. 3)मराठी वाङ्मय क्षेत्रात ग्रामीण व दलित साहित्याच्या योगदानाचा परिचय होईल. 4)साठोत्तरी मराठी साहित्याचे स्वरूप समजेल. 5)दलित साहित्यातून व्यक्त होणाऱ्या विद्रोहाची जाणीव होईल.
एम. ए. भाग २ मराठी (सत्र ३ व ४)	
पेपर क्र. ५. प्रसार माध्यमांसाठी लेखन कौशल्ये (30401,40401)	1) प्रसारमाध्यमा करिता लेखन कौशल्य अवगत होईल. 2) प्रसारमाध्यमांच्या स्वरूपाचे ज्ञान होईल. 3) प्रसारमाध्यमांचे समाजातील महत्त्व विशद करता येईल. 4) दृकश्राव्य माध्यमांसाठी लेखन करण्याची क्षमता विकसत होईल.
पेपर क्र. ६.साहित्य समीक्षा व संशोधन (30402,40402)	1) साहित्य, समीक्षा व्यवहाराच्या क्षमता विकसित होतील . 2) समीक्षेची संकल्पना समजेल . 3) समीक्षा व्यवहारातील मूल्य कल्पनांचा परिचय होईल. 4) संशोधन करण्याची दृष्टीक्षमता विकसित होईल.
पेपर क्र. ७. नेमलेल्या मध्ययुगीन साहित्यकृतींचा अभ्यास(30403,40403)	1)मध्ययुगीन कालखंडातील साहित्य व्यवहार संकल्पना व स्वरूप लक्षात येईल. 2)साहित्यकृतींची वैशिष्ट्ये जाणून घेता येईल. 3)साहित्यकृतीतीलवाङ्मःयीन मूल्यांची जोपासना होईल. 4)कालखंड आणि साहित्यकृतींच्यानिर्मितीचा अनुबंध शोधता येईल.
पेपर क्र.८. लोकसाहित्याची मूलतत्त्वे आणि मराठी लोकसाहित्य(30405,40405)	1) लोकसाहित्याच्या मूलतत्त्वांची ओळख होईल. 2) मराठीतील लोकसाहित्याच्या संकलन, संशोधनास चालना मिळेल . 3) लोकसाहित्याचे स्वरूप व्यापकता लक्षात येईल. 4) लोकसाहित्यातील विविध प्रकार स्वरूप व विशेष समजतील.

Department of Hindi

Programme Specific Outcome (Hindi):

बी.ए. (हिंदी) पाठ्यक्रम पूरा करने पर, छात्र निम्न क्षमताओं में सक्षम होंगे :

PSO1:	हिंदी की मूल अवधारणा और उत्पत्ति को समझना ।
PSO2:	राष्ट्रभाषा हिंदी का महत्व समझना ।
PSO3:	हिंदी साहित्य के विभिन्न पहलुओं को समझने के साथ नई विधा को समझना ।
PSO4	विभिन्न क्षेत्रों की हिंदी पारिभाषिक शब्दावली को समझना ।
PSO5	हिंदी साहित्य की दार्शनिक विधियों को समझना ।
PSO6	अतीत से वर्तमान तक हिंदी की अवधारणा का मूल्यांकन करना ।

Course Outcome (Hindi):

प्रथम वर्ष कला (F.Y.B.A.) 1A 11091B (सामान्य)	
(प्रथम अयन) पाठ्यचर्या: वैकल्पिक हिंदी प्रश्नपत्र -1	1) छात्रों को हिंदी काव्य साहित्य का परिचय देना। 2) हिंदी कहानी साहित्य से अवगत कराना। 3) हिंदी भाषा द्वारा संवाद कौषल विकसित करना। 4) मौलिक लेखन की ओर रूझान बढ़ाना। 5) विज्ञापन लेखन कौषल विकसित करना। 6) अनुवाद संबंधी जानकारी देना। 7) हिंदी कंप्यूटिंग का परिचय देना।
(द्वितीय अयन) 2A 11092B पाठ्यचर्या: वैकल्पिक हिंदी प्रश्नपत्र -1	1)छात्रों को हिंदी काव्य साहित्य का परिचय देना। 2)हिंदी कहानी साहित्य से अवगत कराना। 3)निबंध लेखन कौषल को विकसित करना। 4)छात्रों को विज्ञापन लेखन से अवगत करना।
प्रथम वर्ष वाणिज्य (F.Y.B.com.) (सामान्य)	
(प्रथम अयन) पाठ्यचर्या: 117C वैकल्पिक हिंदी प्रश्नपत्र -1	1) छात्रों को हिंदी काव्य साहित्य का परिचय देना। 2) हिंदी कहानी साहित्य से अवगत कराना। 3) हिंदी भाषा द्वारा संवाद कौषल विकसित करना। 4) हिंदी में इंटरनेट और सॉफ्टवेयर की जानकारी देना। 5) लेखन कौषल विकसित करना।

	6) हिंदी कंप्यूटिंग का परिचय देना।
(द्वितीय अयन) पाठ्यचर्या: 127C वैकल्पिक हिंदी प्रश्नपत्र -1	1)छात्रों को हिंदी काव्य साहित्य का परिचय देना। 2)हिंदी कहानी साहित्य से अवगत कराना। 3)हिंदी भाषा द्वारा संवाद कौषल विकसित करना। 4)विज्ञापन लेखन के प्रकारों को अवगत करना। 5)अनुवाद का स्वरूप से अवगत करना। 6)पारिभाषिक शब्दावली से अवगत कराना।
बी. ए. द्वितीय वर्ष कला	
पाठ्यचर्या: CC-1C (G-2) 23093 आधुनिक काव्य, कहानी तथा व्यावहारिक हिंदी तृतीय अयन (Third Semester)	1) छात्रों को काव्य साहित्य से परिचित कराना। 2) छात्रों को कहानी साहित्य से परिचित कराना। 3) छात्रों को हिंदी कारक-व्यवस्था समझाना। 4) शब्दयुग्म का अर्थ लिखकर प्रत्यक्ष वाक्य मंे प्रयोग समझाना। 5) संक्षेपण लेखन का प्रत्यक्ष बोध कराना। 6) सर्जनात्मकता का विकास कराना।
चतुर्थ अयन CC-1D (G-2) 24093 (Fourth Semester)	1) छात्रों को व्यंग्य पाठ से परिचित कराना। 2) छात्रों को कहानी व्यंग्य पाठ का बोध कराना। 3) साक्षात्कार कला से अवगत कराना। 4) भाषा का मोबाइल तंत्र समझाना। 5) पल्लवन कला से अवगत करना।
पाठ्यचर्या: SEC-2A 23096 Skill Enhancement अनुवाद स्वरूप एवं व्यवहार तृतीय अयन (Third Semester)	1) अनुवाद कौषल से छात्रों को अवगत कराना। 2) अनुवाद का स्वरूप समझाना। 3) अनुवाद क्षेत्र से परिचय कराना। 4) हिंदी से मराठी में प्रत्यक्ष्य अनुवाद कार्य कराना। 5) अंग्रेजी से हिंदी, मराठी में अनुवाद कौषल का विकास कराना।
पाठ्यचर्या: SEC-2B 24096 Skill Enhancement अनुवाद स्वरूप एवं व्यवहार चतुर्थ अयन (Fourth Semester)	1) छात्रों को माध्यम लेखन से परिचत कराना। 2) सृजनात्मक लेखन कौषल विकसित कराना। 3) माध्यम लेखन से अवगत कराना। 4) श्रव्य-दृष्य माध्यमों की भाषा से अवगत कराना।

पाठ्यचर्या: DSC – 1A (S-1) 23091 काव्यशास्त्र (सामान्य) तृतीय अयन (Third Semester)	1) भारतीय काव्यशास्त्र का परिचय देना। 2) काव्य परिभाषा, तत्व आदि से अवगत कराना। 3) काव्य के तत्व, शब्दशक्तियों का परिचय देना । 4) रस का स्वरूप समझाना। 5) भारतीय काव्यशास्त्र में रुचि पैदा करना तथा आलोचनात्मक दृष्टि को विकसित कराना।
पाठ्यचर्या: DSC – 1B (S-1) 24091 काव्यषास्त्र (सामान्य) चतुर्थ अयन (Fourth Semester)	1) छात्रों को साहित्य के भेद से अवगत कराना। 2) छात्रों को पद्य भेद से अवगत कराना। 3) महाकाव्य, खंडकाव्य और मुक्तक काव्य का परिचय कराना। 4) नाटक का स्वरूप समझाना। 5) छात्रों में नाट्य अभिनय की रुचि विकसित करना।

बी.ए. तृतीय वर्ष कला (TYBA G3)

(पंचम अयन) (35093) CC-1E पाठ्यचर्या: कथेतर विधाए

1. छात्रों को हिंदी संस्मरण साहित्य विधा तथा हिंदी की दीर्घ कविताकाव्य/ नाटक के विकास तथा उनके स्वरूप का परिचय देना।
2. छात्रों को रेखाचित्र साहित्य से अवगत करना।
3. सभा-इतिवृत्त लेखन कौशल वृद्धी का विकास करना।
4. छात्रों को मूल्यांकन की दृष्टि का विकास करना।
5. वार्तालेखन कौशल दृष्टि निर्माण करना।

(षष्ठ अयन) (36093) CC-1E पाठ्यचर्या: गजल विधा और पत्राचार

1. छात्रों को गज़ल साहित्य से अवगत करना।
2. छात्रों को गज़लकार के व्यक्तित्व से अवगत करना।
3. छात्रों को सरकारी पत्रलेखन की पद्धति से अवगत कराना।

बी.ए. तृतीय वर्ष कला (हिंदी विशेष) 3-TYBA S3

(पंचम अयन) (35091)DSE 1C पाठ्यचर्या: हिंदी साहित्य का इतिहास

1. हिंदी साहित्य के इतिहास की लेखन परंपरा से अवगत कराना।२.
2. हिंदी साहित्य के इतिहास के कालखंडों के नामकरण एवं पृष्ठभूमि का परिचय देना।

3. हिंदी साहित्य की प्रतिनिधि रचनाओं और रचनाकारों का महत्व, प्रदेय, पूर्ववर्ती तथा परवर्ती प्रभाव
विषद करना।
4. हिंदी साहित्य के विकासक्रम तथा साहित्य के परिवर्तनों के कारणों का परिचय देना।
5. हिंदी साहित्य के इतिहास के माध्यम से साहित्य और युग जीवन का संबंध विषद करना।
6. आधुनिक युग की सामाजिक, राजनीतिक, धार्मिक, साहित्यिक तथा आर्थिक परिस्थितियों के
बदलाव के परिपेक्ष्य में हिंदी साहित्य में आए हुए बदलाव से छात्रों को अवगत कराना।

(षष्ट अयन) (35091)DSE 1C पाठ्यचर्या: हिंदी साहित्य का इतिहास (आधुनिक काल)

1 आधुनिक काल की पृष्ठभूमि से छात्रों को अवगत कराना ।
2 भारतेंदु युगीन , द्विवेदी युग के काव्य की विशेषताओं से अवगत कराना ।
3 हिंदी साहित्य की प्रतिनिधि रचनाओं और रचनाकारों का महत्व, प्रदेय, पूर्ववर्ती तथा परवर्ती प्रभाव
विषद करना।
4 हिंदी गद्य के उद्भव और विकास से छात्रों को अवगत कराना ।
5 आधुनिक युग की साम , राजनीतिक, धार्मिक, साहित्यिक तथा आर्थिक परिस्थितियों के
बदलाव के परिपेक्ष्य में हिंदी साहित्य में आए हुए बदलाव से छात्रों को अवगत कराना।

बी.ए. तृतीय वर्ष कला हिंदी विशेष -TYBA S4

(पंचम अयन) (35092) DSE 1C पाठ्यचर्या: भाषाविज्ञान

1. भाषाविज्ञान के स्वरुप का परिचय देना ।.
2. छात्रों को भाषाविज्ञान की व्याप्ति समझाना ।
3. भाषाविज्ञान के अध्ययन की दिशाओं का परिचय देना।

4. भाषाविज्ञान के अनुप्रयोगात्मक पक्ष को समझाना।
5. साहित्य-अध्ययन में भाषाविज्ञान की उपयोगिता समझाना।

(षष्ट अयन) (36092) DSE 2C पाठ्यचर्या: हिंदी भाषा और उसका विकास

1. भाषाविज्ञान के स्वरुप का परिचय देना।
2. छात्रों को भाषाविज्ञान की व्याप्ति समझाना।
3. भाषाविज्ञान के अध्ययन की दिशाओं का परिचय देना।
4. भाषाविज्ञान के अनुप्रयोगात्मक पक्ष को समझाना।
5. साहित्य-अध्ययन में भाषाविज्ञान की उपयोगिता समझाना।

बी.ए. तृतीय वर्ष कला (TYBA) (Skill Enhancement)
(पंचम अयन) SEC-2C (35096) पाठ्यचर्या :पटकथा लेखन

1. छात्रों को स्क्रिप्ट लेखन, अर्थ, परिभाषा से अवगत कराना।
2. छात्रों को कथा पटकथा और संवाद से परिचित कराना।
3. छात्रों को ड्राफ्ट बनाने से परिचित कराना।

(षष्ट अयन) SEC-2D (36096) पाठ्यचर्या :साहित्य और फिल्मांतरण

1. छात्रों को सिनेमा का स्वरुप से परिचित कराना।
2. छात्रों को हिंदी साहित्य और सिनेमा के अन्तसंबंध से परिचित कराना।
3. छात्रों को हिंदी उपन्यासों पर आधारित फिल्मों से अवगत कराना।

I. Program Outcomes of M.A. Hindi

- छात्रों को साहित्य की सराहना करने और उसका आनंद लेने के लिए सीखने के अनुभव प्रदान करना।
- छात्रों को आत्म अभिव्यक्ति के लिए प्रोत्साहित करना ।
- छात्रों की सांस्कृतिक समझ को विकसित करना।
- छात्रों की रचनात्मक क्षमताओ को विकसित करना।

II. Program Specific Outcomes M.A. (Hindi)

- हिंदी की उत्पति को समझना।
- सर्जनात्मक कौशल विकसित करना।
- आलोचनात्मक दृष्टी का विकास करना।

- विश्लेषणात्मक क्षमता का विकास करना ।

III. Course Outcomes M.A. I (Hindi)
(प्रथम अयन)
पाठ्यचर्या :1 (10501) मध्ययुगीन काव्य
1. हिंदी की मध्ययुगीन काव्य प्रवृत्तियों का परिचय देना।
2. मध्ययुगीन काव्य प्रवृत्तियों की पृश्ठभूमि पर कवि विशेष की रचनाओं का परिचय कराना।
3. तत्कालीन काव्यभाषा की प्रवृत्तियों का परिचय देना।
4. पाठ्यकृतियों के आधार पर काव्य मूल्यांकन की क्षमता का विकास करना।

पाठ्यचर्या :2 (10502) कथा साहित्य
1. उपन्यास विधा से अवगत कराना।
2. कहानी विधा से अवगत कराना।
3. पाठ्य रचनाओं में अभिव्यक्त मूल्यों का संप्रेषण करना।
4. सर्जनात्मक कौशल का विकास करना।

पाठ्यचर्या :3 (10503) भारतीय काव्यशास्त्र
1. भारतीय काव्यशास्त्र के विकास क्रम का परिचय देना।
2. भारतीय काव्यशास्त्र के प्रमुख संप्रदायों से अवगत कराना।
3. रचना वैशिष्ट्य और मूल्यबोध को परखने की क्षमता को विकसित करना।
4. आलोचनात्मक दृष्टि को विकसित करना।

पाठ्यचर्या :4 (10505) नाटककार मोहन राकेश (वैकल्पिक)
1. नाटक के स्वरूप एवं संरचना से परिचय कराना।
2. नाटक के रचनाविधान और रंगमंच से परिचय कराना।
3. हिंदी नाटक और रंगमंच के विकास का परिचय देना।
4. मोहन राकेश के नाटकों के द्वारा नाट्यास्वादन और मूल्यांकन की दृष्टि विकसित करना।
5. नाट्याभिनय कौशल को विकसित करना।

(द्वितीय अयन)
पाठ्यचर्या :5 (20501) कथेतर गद्य साहित्य
1. व्यंग्य, निबंध, रेखाचित्र और संस्मरण विधा से अवगत करना।

2. पाठ्य विधाओं का भाषिक अध्ययन करवाना।
3. मौलिक लेखन कौशल विकसित करना।

पाठ्यचर्या :6 (20502) शोध प्रविधि

1. छात्रों को शोध प्रविधि से अवगत कराना।
2. शोध दृष्टी का विकास करना।
3. नये शोधप्रवाहों से परिचय कराना।-
4. शोध प्रक्रिया एवं शोध प्रबंध लेखन कौशल विकसित करना।

पाठ्यचर्या :7 (20503) पाश्चात्य काव्यशास्त्र

1. पाश्चात्य काव्यशास्त्र के विकासक्रम का परिचय देना।
2. पाश्चात्य चिंतकों के चिंतन, सिद्धांत और प्रमुख आंदोलनों से अवगत करना।
3. छात्रों को सृजन, आस्वादन एवं आलोचना दृष्टी देना।

पाठ्यचर्या :8 (20505) हिंदी उपन्यास साहित्य (वैकल्पिक)

1. हिंदी उपन्यास साहित्य के विकासक्रम एवं प्रवृत्तियों से परिचित कराना।
2. उपन्यासों के आस्वादन, अध्ययन की क्षमता विकसित करना।
3. पाठ्य रचनाओं में प्रस्तुत साहित्यिक मूल्यों का संप्रेषण करना।
4. मूल्यांकन की दृष्टी का विकास करना।

III. Course outcomes M.A. II (Hindi)
(तृतीय अयन)
पाठ्यचर्या 9 :(30501) आधुनिक काव्य (आदर्शवादी, छायावादी तथा अन्य काव्य)

1 छात्रों को आधुनिक काव्य से अवगत कराना।
2 छात्रों में आधुनिक काव्य अध्ययन की-दृष्टी विकसित करना।
3 काव्य मुल्याकन दृष्टी विकसित करना।
4 काव्य संवेदना एवं-शिल्पगत अध्ययन से छात्रों को अवगत करना।
5 छात्रों में काव्यसर्जन कला का विकास करना।-

पाठ्यचर्या 10 :(30501) भाषा विज्ञान

1 भाषाविज्ञान के स्वरूप का परिचय देना।
छात्रों को 2 भाषाविज्ञान की व्याप्ति समझाना।

3 भाषाविज्ञान के अध्ययन की दिशाओं का परिचय देना।
4 भाषाविज्ञान के अनुप्रयोगात्मक पक्ष को समझाना।
5 साहित्य अध्ययन मेंभाषाविज्ञान की उपयोगिता समझाना।

पाठ्यचर्या 11 :(30503) हिंदी साहित्य का इतिहास आदिकाल), भक्तिकाल, रीतिकाल (

1 हिंदी साहित्य इतिहास लेखन का परिचय देना।
2 हिंदी साहित्य इतिहास के कालविभाजन तथा नामकरण का परिचय देना।
3 आदिकालीन, भक्तिकालीन, रीतिकालीन प्रमुख साहित्यिक प्रवृत्तियों, रचनाकारों और रचनाओं से
परिचित कराना।

पाठ्यचर्या(12 : (30504) हिंदी आलोचना

1 आलोचना के स्वरूप एवं विविध प्रकारों से अवगत कराना।
2 हिंदी के प्रमुख आलोचकों के आलोचनात्मक प्रतीमानों का परिचय देना।
3 साहित्यालोचन एवं व्यावहारिक समीक्षा दृष्टी विकसित करना।

(चतुर्थ अयन)

पाठ्यचर्या 13 :(40501) आधुनिक कविता

1 छात्रों को आधुनिक काव्य से अवगत कराना।
2 छात्रों में आधुनिक काव्य अध्ययन की-दृष्टी विकसित करना।
3 सर्जनात्मक कौशल से अवगत करना।
4 आलोचानात्मक दृष्टी विकसित करना।

पाठ्यचर्या14 : (40502) हिंदी भाषा का विकास

1. हिंदी भाषा की ऐतिहासिक पृष्भूमि से अवगत कराना।
2. आधुनिक आर्य भाषओंका का परिचय देना।
3. हिंदी के स्वनिम व्यवस्था का परिचय देना।
4 हिंदी की रूप रचना से अवगत अवगत करना।

पाठ्यचर्या 15 :(40503) हिंदी साहित्य का इतिहास (आधुनिक काल)

1 हिंदी गद्य के उद्भव और विकास से छात्रों को अवगत कराना।
द्विवेदी युग, छायावाद, प्रगतिवाद, प्रयोगवाद और नई कविता के प्रमुख
1 द्विवेदी युग, छायावाद, प्रगतिवाद, प्रयोगवाद और नई कविता के प्रमुख साहित्यिक प्रवृत्तियों,रचनाकारों और रचनाओं से परिचित

कराना।

2 ऐतिहासिक दृष्टी विकसित करना।

3 हिंदी भाषा के योगदान से अवगत करना।

पाठ्यचर्या 16 :(40504) भारतीय लोकसाहित्य

1 लोकसाहित्य के स्वरूप एवं महत्व से परिचित कराना।
2 लोकसाहित्य के विविध प्रकारों से परिचित कराना।
3 लोकसाहित्य की व्यापकता से परिचित कराना।
4 महाराष्ट्र के लोकसाहित्य का परिचय देना।

Programme Specific Outcome: M.A. (Hindi):

PSO1 :	हिंदीभाषाकेमाध्यमसेराष्ट्रकेप्रतिप्रेमएवंसामाजिकप्रतिबद्धताकीभावनाविकसितकरना।
PSO2 :	राष्ट्रीयऐक्य, सामाजिकउत्तरदायित्व, वैज्ञानिकताआदिमूल्योंकेप्रतिध्यानआकर्षितकरना।
PSO3 :	नैतिकमूल्य ,राष्ट्रीयमूल्यतथासामाजिकमूल्योंकेप्रतिआस्थानिर्माणकरना।
PSO4	देशकेसुदूरइलाकोंतकराष्ट्रभाषाहिंदीकाप्रचार -प्रसारकरना।
PSO5	छात्रोंकीसर्जनात्मकशक्तिकाविकासकरना।
PSO6	छात्रोंमेंशोधप्रबंधलेखनकीकलाविकसितकरना।

Course Outcome M.A. (Hindi):

एम. ए. भाग १ (सत्र १ व २)	
पेपरक्र.1 मध्ययुगीनकाव्य(10501)	1.छात्रों को मध्य युगीन काव्य प्रवृत्तियोंसे अवगत कर साहित्य के प्रति अभिरूची बढाने हेतू मदद हुई। 2. छात्रों को हिंदी के 'स्वर्णयुग ' के साहित्य का परिचय तथा भक्त कवि कबीर, तुलसीदास, सुरदास, मीराबाई, बिहारी आदि कवियों के साहित्य कृतियों का परिचय करवाया। 3. छात्रोंमेंसर्जनात्मककौशल्यकाविकासकरना।
पेपरक्र 2 • कथासाहित्य(10502)	1. छात्रोंकोहिंदीउपन्यासविधासेपरिचितकिया। 2. छात्रोंमेंसाहित्यिककृतियोंकेमाध्यमसेजीवनमूल्यतथानैतिकमूल्यों कासंप्रेषणकियागया।
पेपरक्र.- 3. •भारतीयकाव्यशास्त्र (10503)	1. छात्रोंकोभारतीयकाव्यशास्त्रकेविकासक्रमकापरिचयदिया। 2. छात्रोंकोसाहित्यकीरचनावैशिष्ट्यऔरमूल्यबोधकोपरखनेकीक्षमताकोविकसितकिया ।
पेपर क्र.4. - •नाटककारमोहन राकेश(10505)	1. छात्रोंकोनाटकविधाकेरचनाविधानऔररंगमंचसेपरिचितकरवाया । 2. छात्रोंमेंनाट्यास्वादन, मूल्यांकनएवंनाट्याभिनयकौशलकाविकासकियागया ।
एम. ए. हिंदी भाग1 सेमीस्टर 2	
पेपरक्र5 - •कथेत्तरगदयसाहित्य(20501)	1. छात्रोंकोहिंदीनिबंध, व्यंग्य, रेखाचित्रऔरसंस्मरणविधाकीजानकारीदीगई। 2. छात्रोंकोपाठ्यविधातथाभाषिकअध्ययनकरसृजनात्मकएवंमौलिकलेखनकौशलविकसितकियागया ।
पेपरक्र 6 •शोधप्रविधि(20502)	1. छात्रोंकोशोधदृष्टितथाशोधप्रविधिकेनयेप्रवाहोंकीजानकारीदी। 2. छात्रोंमेंशोधप्रक्रियाएवंशोधप्रबंधलेखनकौशलविकसितकिया ।
पेपरक्र 7	1.छात्रोंकोपाश्चात्यकाव्यशास्त्रकेविकासक्रमसेपरिचितकरपाश्चा

•पाश्चात्यकाव्यशास्त्र(20503)	त्यचिंतकोंकेसिद्धांतऔरप्रमुखआंदोलनकीजानकारीदी। 2. छात्रोंमेंसृजन, आस्वादनएवंआलोचनादृष्टिविकसितकराना।
पेपरक्र 8 •हिंदीउपन्याससाहित्य (20505)	1.छात्रोंमेंहिंदीउपन्याससाहित्यकेविकासक्रमएवंप्रवृत्तियोंकापरिचयकरउपन्यासोंकेआस्वादन, अध्ययनकीक्षमताविकसितकराना। 2. छात्रोंमेंसाहित्यिकमूल्योंकासंप्रेषणकरनातथामूल्यांकनकीदृष्टिकाविकासकिया ।
एम. ए हिंदीभाग 2 सेमीस्टर -3	
पेपरक्र -9 •आधुनिककाव्य(आदर्शवादी, छायावादीतथाअन्य काव्य) (30501)	1.छात्रोंकोहिंदीआधुनिककाव्यसेपरिचितकरानातथाकाव्यअध्ययनकीदृष्टिविकसितकराना। 2.छात्रोंमेंकाव्यमूल्यांकनदृष्टि, काव्य संवेदना एवं शिल्पगत अध्ययनसे हिंदीभाषामें काव्य सृजन कला विकास करने की प्रेरणा जागृतकरना।
पेपरक्र -10 •भाषाविज्ञान (30502)	1. छात्रोंकोभाषाविज्ञानकापरिचयतथाव्याप्तीस्पष्टकीगई। 2.छात्रोंकोभाषाविज्ञानकेअध्ययनएवंअनुप्रयोगात्मकपक्षकापरिचयदेकरसाहित्यमेंभाषाविज्ञानकीउपयोगितासमझाना ।
पेपरक्र -11 •हिंदी साहित्य का इतिहास (आदिकाल, भक्तिकाल, रितिकाल)(30503)	1. छात्रोंकोहिंदीसाहित्येतिहासलेखन, कालविभाजनतथानामकरणकापरिचयकियागया। 2. आदिकालीन, भक्तिकालीन, रीतिकालीनप्रमुखसाहित्यिकप्रवृत्तियाँ, रचनाकारोंऔररचनाओंसेपरिचितकराया।
पेपर क्र12 हिंदी आलोचना(30504)	1.छात्रोंमेंआलोचनाकेस्वरूपएवंविविधप्रकारोंसेअवगतकरहिंदीआलोचकोंकेआलोचनात्मकप्रतिमानोंकापरिचयदिया । 2. छात्रोंमेंसाहित्यालोचनाएवंव्यावहारिकसमीक्षादृष्टिविकसितकी गई ।
एम ए भाग 2 सेमीस्टर 4	
पेपरक्र -13	1. छात्रों में आधुनिक काव्य अध्ययन की दृष्टि विकसितकराना।2. छात्रोंमेंसर्जनात्मककौशलएवंआलोचनात्मकदृष्टिविकसितकीगई।

•आधुनिक कविता(40501)	
पेपरक्र14 •हिंदीभाषा काविकास (40502)	1. छात्रोंकोहिंदीभाषाकीऐतिहासिकपृष्ठभूमि, आधुनिकआर्यभाषा, हिंदीकेस्वनिमव्यवस्थासेपरिचितकिया। 2. छात्रोंमेंहिंदीभाषाकीरूपरचनातथाभाषाकेयोगदानकामहत्वसमझाया।
पेपरक्र15 •हिंदीसाहित्यकाइतिहास (आधुनिक काल) (40503)	1. छात्रोंकोहिंदीगदयकेउद्भवऔरविकासकापरिचयकरवाया। 2. छात्रोंकोद्विवेदीयुग, छायावाद, प्रगतिवाद, प्रयोगवादऔरनईकविताकेप्रमुखसाहित्यिकप्रवृत्तियों, रचनाकारोंऔररचनाओंकीजानकारीदीगई।
पेपर क्र16 •भारतीय लोकसाहित्य (40504)	1. त्रोंकोलोकसाहित्यकेस्वरूपएवंमहत्वसेपरिचितकरलोकसाहित्यकेविविधप्रकारोंकीजानकारीदी। 2. लोकसाहित्य की व्यापकता तथा महाराष्ट्र के लोक साहित्य का परिचय देकर छात्रों में सृजनात्मक पक्ष का विकास किया ।

Department of English

Programme Specific Outcome (English):

PSO1:	Students expose to the best examples of literature in English and to contribute to their emotional quotient as well as independent thinking.
PSO2:	Development of effective communication skills

Course Outcome (English):

F. Y. B. A Compulsory English (11011/11012)	1) Explosion of students to the best examples of prose and poetry in English so that they realize the beauty and communicative power of English 2) Introduction of human values and develop the character of students as responsible citizens of the world 3) Development of the ability to appreciate ideas and think critically Enhancement of employability of the students by developing their linguistic competence and communicative skills 4) Revision and reinforcement of structures already learnt in the previous stages of learning.
F. Y. B. A- Optional English (General Paper-1) (13331 / 13332)	1) Explosion to students to the basics of literature and language and develop an integrated view about language and literature in them 2) Acquaintance them with minor forms of literature in English and help them to appreciate the creative use of language in literature 3) Introduction to the basics of phonology of English 4) Preparation of students to go for detailed study and understanding of literature and language 5) Enhancement of the job potential of students by improving their language skill
F. Y. B. Com Compulsory English (CBCS) (111/ 121)	1) Students offered relevant and practically helpful pieces of prose and poetry so that they not only get to know the beauty and communicative power of English but also its practical application 2) Students exposed to a variety of topics that dominate the contemporary socio-economic and cultural life 3) Development of oral and written communication skills of the students so that their employability enhances 4) Development of overall linguistic competence and communicative skills of students
F. Y. B. Com (Additional English) (CBCS) (117A/127A)	1) Exposition of students to a good blend of old and new literary extracts having various themes that are entertaining, enlightening and informative so that they realize the beauty and Communicative power of English 2) Students made aware of the cultural values and the major problems in the world today

	3) Development of literary sensibilities and communicative abilities among students
SYBA - Compulsory English (Core Course-CC) (23001/24001)	1) Exposition of students to the best examples of literature in English and to contribute to their emotional quotient as well as independent thinking. 2) Installation of universal human values through best pieces of literature in English 3) Development of effective communication skills by developing ability to use right words in the right context. 4) To enhance employability of the students by developing their basic soft skills 5) Revision and reinforcement the learning of some important areas of grammar for better linguistic competence.
Skill Enhancement Course-SEC-1A Advanced Study of English Language (G2) (23333 / 24333)	1) Familiarize students with the various components of language. 2) Development of overall linguistic competence of the students. 3) Introduction to students to some advanced areas of language study. 4) Preparation of students to go for detailed study and understanding of language. 5) Enhancement of communicative skills of students by developing insight into the working of language
Discipline Specific Course (DSC-1A) Appreciating Drama (S1) (23333/24331)	1) Introduction to Drama as a major form of literature 2) Introduction to minor forms of Drama 3) Acquaint and enlighten students regarding the literary and the performing dimensions of drama 4) Acquaint and familiarize the students with the elements and the types of Drama 5) Encouragement of students to make a detailed study of a few sample masterpieces of English Drama from different parts of the world 6) Development of interest among the students to appreciate and analyze drama independently 7) Enhancement of students' awareness regarding aesthetics of Drama and to empower them to evaluate drama independently
Discipline Specific Course (DSC-2A) Appreciating Poetry (S2) (23332/24332)	1) Acquaintance of students with the terminology in poetry criticism (i.e. the terms used in appreciation and critical analysis of poems) 2) Encouragement of students to make a detailed study of a few sample masterpieces of English poetry 3) Enhancement of students awareness in the aesthetics of poetry and to empower them to read, appreciate and critically evaluate poetry independently
Skill Enhancement Course-(SEC-2A) (23334/24334) "Mastering	1) Enhancement of the skill of using English for everyday communication. Acquaintance of the students with the verbal and nonverbal communication 2) Creation of opportunities to access exposure of speaking in various

Communication Skills"	contexts 3) Acquaintance and familiarization of the students with soft skills 4) Development of interest among the students to interact in English
SYBSC & SYBSC (Computer Science) ENGLISH (23922 / 24922) (Ability Enhancement Course-AEC)	1) Students introduced with the use of English in multimedia 2) Students acquainted with the language skills in multivalent contexts 3) Acquaintance and enlightenment of students regarding the speaking skill in various contexts 4) Students acquainted and familiarized the with advanced writing skills in different contexts 5) Students acquainted and familiarized the students with soft skills 6) Minimized the gap between the existing communicative skills of the students and the skills they required at professional level
T. Y. B. A. Compulsory English (1317)	1) Students familiarize with some excellent pieces of prose and poetry in English so that they realize the beauty and communicative power of English. 2) Students enable to become competent and effective users of English in real life situations. 3) Students contribution to the overall personality development. 4) Instillation of humanitarian values and foster sympathetic attitude in the students. 5) Students trained in practical writing skills required in work environment.
Skill Enhancement Course (SEC 1-C & SEC 1-D) (Old G-3) Title of the Paper: Enhancing Employability Skills (3337)	1) Students got awareness of career opportunities available to them. 2) Students identify the career opportunities suitable to them. 3) Students understand the use of English in different careers. 4) Students developed competence in using English for the career of their choice. 5) Students enhanced skills required for their placement
Discipline Specific Elective (DSE-1C& DSE-1D) (Old S-3) Title of the Paper: Appreciating Novel (3338)	1) Students introduced to the basics of novel as a literary form 2) Students exposed to the historical development and nature of novel 3) Students made aware of different types and aspects of novel 4) Development of literary sensibility and sense of cultural diversity in students 5) Students exposed to some of the best examples of novel
Discipline Specific Elective (DSE-2C & DSE-2D) (Old S-4) Title of the Paper: Introduction to Literary Criticism	1) Introduction to students to the basics of literary criticism 2) Students made aware of the nature and historical development of criticism 3) Students made familiar with the significant critical approaches and terms 4) Students encouraged to interpret literary works in the light of the critical approaches

(3339)	5) Development of aptitude of students for critical analysis

Programme Specific Outcome: M.A. (English):

PSO1:	Encouragement to self-expression and creativity, to enhance students' critical and analytical skills, Improvement of students' in their competence to use of English
PSO2:	Provided the learners with learning experiences to appreciate and enjoy literature

Course Outcome M.A. (English):

MA- I (English)	
Paper 1.1: English Literature from 1550 to 1798 (10601 /20601)	1) Students introduced with the major movements and figures of English Literature through a study of selected literary texts/pieces published during the period prescribed for study. 2) Learners' enhanced the literary sensibility and their emotional response to literary texts and to help them understand the thematic and stylistic preoccupations of the writers prescribed for study. 3) Students enabled to critically examine the writers' thematic concerns and to point out the (in) significance of such concerns in the postcolonial context. 4) Students recognized the distinctive ways in which the writers differed, in their ideological positions, from their counterparts belonging to different ages. 5) Students enhanced their proficiency in English.
Paper – 1.2: English Literature from 1798 to the Present (10602/20602)	1) Learners provided with some basic information about England's political, social and cultural developments during the period prescribed for study. 2) Students enabled to critically assess the 'universal' values that writers tend to project in their writings. 3) Learners apply the literary-critical principles they study in the paper 'Literary Criticism and Theory' to the texts prescribed or to any other text they read. 4) Students explain the canonical relevance of the texts prescribed for them. 5) Students identify potential areas of research on which they can work independently for securing a degree or merely for the sake of obtaining knowledge.
Paper 1.3: Contemporary Studies in English Language (10603/20603)	1. Students introduced to the basic tools essential for a systematic study of language 2. Students acquainted with the basic concepts and issues in linguistics 3. Learners introduced to various sub-disciplines of linguistics 4. Students know some of the theoretical assumptions underlying language and to enable them to apply the acquired linguistic skills in real life situations 5. Learners introduced to the syntactic features of the English language 6. Students helped to shake off some of the regional features of English pronunciation
Paper – 1.4: Literary Criticism and Theory (10604/20604)	1) Students introduced with the nature, function and relevance of literary criticism and theory 2) Learners introduced with the various important critical approaches and their tenets 3) Students encouraged dealing with highly intellectual and radical content and thereby developing their logical thinking and analytical ability 4) Students developed sensibility and competence in them for practical application of critical approach to literary texts
MA- II (English)	

Paper-3.1: Indian Writing in English (Core Paper) (30601/40601)	1) Students introduced with major movements and figures of Indian Literature in English through the study of selected literary texts. 2) Creation of literary sensibility and emotional response to the literary texts and implant sense of appreciation of literary text 3) Exposition of students to the artistic and innovative use of language employed by the writers 4) Instillation of values and develop human concern in students through exposure to literary texts. 5) Students enhanced the literary and linguistic competence.
Paper-3.5: Academic Writing and Critical Reading (30605/40605)	1) Students introduced with to be aware of how to write formal and academic prose in English. 2) Students acquainted how to present their research findings in a clear and structured manner. 3) Students helped to understand students how to read English texts in their field and discuss them in English. 4) Students introduced with the theories of reading.
Paper-3.6: American Literature (30606/40606)	1. Students provided with a general introduction to the major texts that led to the evolution of American literature as an independent branch of literature in English. 2. Students familiarized with the issues and problems America has gone through and how they find expression in her literature. 3. Students helped to gain a broad historical view of the entire period from the time of the early settlers, through the westward movement to the contemporary period. 4. Students provided a general idea about the religious, socio-political, literary and cultural movements in America.
Paper-3.8: World Literature in English (30608/40608)	1. Students introduced with some of the important literary texts of the world 2. Learners gained some insights into the socio-cultural aspects of the regions from where the texts are chosen. 3. Students enabled to compare the authors of the world with Indian writers in English or the writers in their own languages. 4. Students helped to the various techniques employed by the authors and how the techniques are adapted/adopted by Indian authors. 5. Students would undertake research in comparative literature

Department of Economics

Programme Specific Outcome (Economics):

On successful completion of **B.A. Course (Economics)** the students are able to:

PSO1	Understand the basic Concepts and theories of Economics
PSO2	The students are able to analyze the Economic behavior in Practice
PSO3	The students are able to develop Economic way of thinking
PSO4	The ability of students enhances about the historical and Current Events of Economy
PSO5	The ability of students to write clearly expressing an Economic Point of View
PSO5	The students are able to tackle their Personal Economic Problems through the entire course.
PSO6	The students are able to suggest various measures on Economic Problems

Course Outcome (Economics):

Economic Environment) (Sem- I 11151)&Sem-II 11152)	**F.Y.B.A (Indian** • Students will be familiarized about background of Indian economic environment • Ability to compare the India economic environment with international economic environment will be genrated • Students will be awared about the banking system • Students will get a primary introduction of different sector of Indian economy such as agri, industry and service. • awareness about digital economy will be generated and they will be ready for the digital India
1. Financial System - I&II, G-2 (Sem-III 23153) & (Sem-IV 24153)	**S.Y.B.A** • Understand fundamentals of modern financial system. • Understand the recent trends and developments in banking system. • Understand the role of the Reserve Bank of India in Indian financial system. • Provide the knowledge of various financial and non-financial institutions. • Provide the students the intricacies of Indian financial system for better financial decision making.
2.**Micro Economics, -I&II, S-1 (Sem-III 23151) & (Sem-IV 24151)**	**S.Y.B.A** • Develop an understanding about subject matter of Economics • impart knowledge of microeconomics.

	• Clarify micro economic concepts • Analyze and interpret charts, graphs and figures • Develop an understanding of basic theories of micro economics and their application. • Demonstrate that the theories discussed in class will usually be applied to real-life situations. • Help the students to prepare for varied competitive examinations
3 Macro Economics, -I&II,S-2 (Sem-III 23152) & (Sem-IV 24152)	**S.Y.B.A** • Introduce students to the historical background of the emergence of macroeconomics • Familiarize students with the differences between microeconomics and macroeconomics • Familiarize students with various concepts of national income • Familiarize students with keynesian macroeconomic theoretical framework of consumption and investment functions • Introduce students to the role of money in an economy. • Introduce students to the conceptual and theoretical frameworks of inflation, deflation and stagflation, Business Cycle . • Familiarize students with the conceptual and theoretical framework of business cycles • Introduce students to the role of monetary and fiscal policies in fulfilling the macroeconomic objectives of stability, full employment and growth. • Introduce students to the various instruments of monetary and fiscal policies
Basic Concept of Research Methodology.Skill Enhancement Course -I&II, (SEC): (Sem-III 23154) & (Sem-IV 24154)	**S.Y.B.A** • On completion of the course, the student shall be able to : • Demonstrate his/her understanding of sampling methods and the ability to use collection of data • Identify the appropriate sample techniques for different kinds of research questions • Identify the appropriate source of data in relation to the collection of research data. • Able to classify and present the collected data in the form of graph, bar diagram, chart etc

T.Y.B.A.

1 Indian Economic Development(G3) Paper-I & II, Sem-V & VI

- Introduction of the concept like indicators of growth & development
- Students will study different development theories
- Students will study study different growth modeless
- Importance of economic Planning,& importance of foreign capital will be studied by students.

2 International Economics (S3) Paper-I & II, Sem-V & VI

- Understanding nature scope & Importance of international Economics
- Understanding of theories of international trade
- Understanding the role of international financial Institutions
- Importance of foreign capital into the economy will be studied by students

3 Public Finance (S4) Paper-I &II, Sem-V & VI

- Understanding of the role of government in economy
- Various expenditure & revenue process in the public finance will be analyzed
- Information of fiscal policy in public finance and its importance will enhance students macro level thinking
- Study of the theories of social welfare

4 Skill Enhancement Course (SEC-3A) Sem-V Business Management- I & Sem-VI Business Management- II (Project Report)

On Successful Completion of the Course the students are able to understand the Concepts and acquire the skills of

- Management of Business
- Business planning and decision making
- Leadership Skills- Ability to work in teams at the same time, ability to show leadership qualities
- Analytical Skills – Ability to analyze data collected and interpret in the most logical manner
- Project Report Writing Skills- Ability to comprehend and illustrate/demonstrate findings
- Presentation Skills – PPT/Poster- Ability to illustrate findings in the most appealing manner
- Leadership Skills: Ability to show leadership skills with business ideas or work on business ventures as a practical example

Program - B.Com.(Economics)	
1 Business Economics -I&II, (Micro) (Sem-I-113) & (Sem 123)	**F.Y.B.Com (Sem-I &Sem-II)** • Meaning, nature & scope of business economics will be given to all students. • Understanding of basic concept of micro economics • Students will learn to analyze demand & supply its determinants • Analysis of market structure & pricing under the same • Remunerative structure of different factors of production will be studied.
Business Economics I & II (Macro) (Sem-III 233) &	**S.Y.B.com (Sem-III & Sem-IV)** • Information over Meaning nature & scope of macro economics.

(Sem-IV 243)	• Students will learn to calculate National income & its importance. • Use of money its functions and value of its value • Analysis of trade cycles and their occurrence after certain specified period will be studied by students. • Learning the evolution of different Employment theories. • Information Public finance and its policy approached will be given to students
T.Y.B.com (Sem-V & VI) **International Economics -I & II** On Successful Completion of the Course the students are able to • understand present Economic Scenario of Indian Economy as well as World Economy. • understand the working of foreign trade market and foreign exchange market. • comprehend trade policies and concepts related to trade policies. • use the subject knowledge in their future academic and professional venture • comprehend the basic concepts of balance of payment and foreign exchange. • evaluate the working and functions of international organizations and institutions. • apply the knowledge while preparing for the competitive examinations and other future prospects.	

Programme Specific Outcome (Economics):

On successful completion of **M.A. Course (Economics)** the students are able to:

PSO1	The students will be acquaint with unique opportunity of obtaining a professional qualification in Economics
PSO2	The students are able to analyze the economic behavior in Practice
PSO3	The ability of writing a clear expression of Students from Economic point of view.
PSO4	The skill of students enhances about understanding the Various economic Problems of the country
PSO5	The students are able to enhance the ability of comprehensive understanding of Interdisciplinary issues and aspects of society
PSO6	The students are able to enhance the ability of comprehensive understanding of Interdisciplinary issues and aspects of society
PSO7	The students from Economics able to explain the role of Govt. policies in Economic development
PSO8	The student are able to predict the impact of Fiscal and Monetary Policy on Overall Economic Performance
PSO9	The students are able to explain the Economic Problems very well
PSO10	The students Are able to discuss cost and causes of Unemployment and Assess the

	public policies
PSO11	Students are able to formulate informed opinion on Policy issues.

Students have an opportunity to get exposed to a few elements of social research and also get complete a small research project.

Course Outcome: M.A (Economics)	
Course Name	**Output**
Micro Economic Analysis(Sem- I EC-12301)&(Sem-II 22301)	On Successful Completion of the Course • The students are able to understand the Problems of Basic Economic Problems • The students are accompanied with to retrieve the relation between different variables through various laws like Law of Demand, Law of Supply • The students will understand the Indifference curves, Elasticity ofDemand and Their Types • The students are able understand the relation between various variables through law of Variable to Proportion and Law of Returns to Scale • The Students are able to understand Market structure • Social welfare and welfare economics inculcate the values among the students
Public Economic (Sem- I 12302) & (Sem-II 22302)	On Successful Completion of the Course • Through this subject the students are able to understand the role of government in economic activities • The students are able to understand the difference between Public goods, Private goods as well as their benefits • The students are acquaint with various theories and Models of Public economics • The students are become familiarizes with theories of Public Expenditure • The students are able to understand the concepts of Budget and deficit Finance • The students are acquaint with the Public debt of India
International Trade and Finance (Sem- I 12303) & (Sem-II 22303)	On Successful Completion of the Course • On successful completion of this course the student are enabled with the Knowledge in Classical and Modern Theories of International Trade • After the successful completion of the course the student should have a thorough knowledge on the Gains from International Trade & Concepts of Terms of Trade other allied aspects. • On successful completion of this course, the student should be well versed in the concepts, tools and principles in the field of International Economics. • On successful completion of this subject the students have the ability to understand the functions of WTO,GATT& other institutions
Agricultural Economics (Sem- I 12304) & (Sem-II 22304)	On Successful Completion of the Course • The students will understand the Agricultural Economics and their terms as well as various theories. • The students will acquaint with Present Agricultural Scenario of Indian Economy

	• The students will be understood the Problems of farmers and Agricultural Sector • The will know the causes and impacts of various government schemes on agricultural Productivity • The students will become familiarize with Agricultural Challenges and Barriers
Macro Economic Analysis (Sem- III 32301) & (Sem-IV 42301)	On Successful Completion of the Course • The students of Macro Economics will understand the Concepts of GNP, GDP, NNP, NDP etc. • The students are able to understand the theories of National Income • The students are able to understand the Macroeconomics not only a scientific method of Analysis, but also a body of empirical economic Knowledge • The students will understand the various concepts of Output and Employment opportunities
Growth and Development (Sem- III 32302)& (Sem-IV 42302)	On Successful Completion of the Course • The students are able to understand Concepts of Growth and Development • The students are able to familiarizes with theories of Economics growth and development • The students are able to understand the Human Development Index and Others • The students are able to Understand Problems of Population and Measures • The students are able to understand the Income distribution among the People
Research Methodology I (Sem- III 32303) **Research Project (Sem-IV 42303)**	On Successful Completion of the Course • Ability to develop, demonstrate and examine topics under Economics to pursue research. • Ability to evaluate and examine subject areas in economics and explore possibilities of research • Students who complete their post-graduation in Economics are mentally equipped to pursue research in the same discipline. It is generally accepted that research is nothing but extension and application of knowledge in a certain specialized field. • Students will be given an opportunity to get exposed to a few elements of social research and also they are expected to complete a small research project under the expert guidance and supervision,. It is essentially a job-oriented exercise to enable them to take up the exciting field of social and economic research.
Demography (Sem- III 32305)	On Successful Completion of the Course • The students are able to understand Nature, Scope and relation between development and population • The student will be Understand the various theories of population. • The student will be Learn about Structure and characteristics of Indian population. • The students are able to an analysis of Indian population policy.
Economics Of Environment	• Ability to analyze and evaluate the subject with reference to various aspects of the economics of environment.

(Sem-IV 42306)	• Ability to develop an understanding of the economics of environment and various analytical tools to comprehend environmental issues

Department of Political Science

Programme Specific Outcome (Political Science):

PSO1	Knowledge about political system of the nation.
PSO2	Study of national and international political affairs.
PSO3	Study from competitive examination point of view.
PSO4	Understanding the government mechanism, its functions, duties and responsibilities.
PSO5	Creating appropriate and efficient political leaders.
PSO6	Getting knowledge of political law.
PSO7	Getting knowledge of Constitution of India

Course Outcome (Political Science):

FYB.A.- : G1 Introduction to Indian Constitution. Course Code:11161/11162 A	1. Acquiring the knowledge about Indian Constitution. 2. Getting awareness about one's rights and duties. 3. Getting information about political parties and system of justice in India. 4. Knowing about the problems and challenges in Indian politics.
S.Y.B.A.-: Paper G2,S1,S2, G2- Introduction to Political Science. Course Code: 23163/24163	1. Getting information about the system of the Constitution and Government 2. Study of different constitutions comparatively
S1- Western Political Thoughts :- Course Code : 23161/24161	1. Getting information about western thinkers and their political thoughts. 2. Comparative study of the ancient thoughts and modern thoughts.
S2- Political Journalism Course Code : 23162/23162	1.Study of the Indian Political Thinking and their thoughts. 2. Study of the contribution of political thinkers in independent movements and their need for modern society

T.Y.B.A.

Course Name: Local Self Government in Maharashtra [Sem V CC-1 E (3)/ Sem VI CC-2 E (3)]

Course Code:35164/36164

Total credits: 03

1) Getting information about the historical survey the formation of Maharashtra State.
2) Study of the local governing mechanism.
3) Developing leadership at local level.

Course Name: Public Administration [Sem V DSE 1 C (3)+1/ Sem VI DSE 1 D (3)+1]

Course Code:35161/36161

Total credits: 04

1) Study of the administrative system of the nation.
2) Getting information about various concepts in Public Administration.
3) Study of the mechanism for the solution of problems in Public Administration.

Course Name: International Politics [Semester V DSE 2 C (3)+1/ Semester VI DSE 2 D (3)+1]

Course Code:35162/36162

Total credits: 04

1) Study of the international political system.
2) Study of the international & regional organizations.
3) Study of the relations of India with neighbouring countries.

Course Name: Samyukta Maharashtra Movement [Sem V SEC 2C (2)/ Sem VI SEC 2D (2)]

Course Code:35165/36165

Total credits: 02

1. Students will know Prominent leaders of the Samyukta Maharashtra Samiti
2. To know the Indian National Congress had pledged to introduce linguistic states prior to Independence.

Department of Sociology

Programme Specific Outcome (Sociology):

PSO1	Develop a sociological imagintion to make sense of the reality in a more comprehensive manner.
PSO2	Provide basic knowledge of sociological concets and methods and developing ability to identify the challenges in sociological field of enquiry.
PSO3	Recognize the scope of sociology in terms of career opportunities employment and life skills.
PSO4	Foster critical reflexive and analytical thinking skills

Course Outcome (Sociology):

FYBA Sem-I 11371 Sociology G1 Introduction to sociology	1) Understanding of all concepts types and charactristics 2) Detail Understanding of different topics related to media like –Types of media.(print and social)
FYBA Sem-II 11372 sociology G1 Social Institution and change	1) In depth knowledge /Understanding about contribution of technology, civil society and social movement in development Modernization and Globalization of socitey. 2) To acquaint students with concepts and currents version of social change.
SYBA Sem-I 23371 (Special Sociology) S1 Foundations of sociological Thouht	1) Understanding of different concept reated to foundation of sociological thoghts 2) To familiarize the students to major perspctives and works of some indian sociologists.
SYBA Sem-II 24371 (Special Sociology) S1 Development of sociological in indiaI	1) Stuents get familiar with the topics related to colonial background Nationalism and development of sociolgy in india
SYBA Sem-I 23372 (Special Sociology) S2 Society in india understanding issues	1) Stuents can able to analyse and study in details in society like - social issues Trends and types of social issues 2) To enable students to analyze social issues and problems using different sociological perspectives.
SYBA Sem-II 24372 (Special Sociology) S2 Indian society core lssue	1) Stuents also get familiarize with below concepts and their nature effect solutions like - social inequalities - Effect of inequalititeson
SYBA Sem-I 23373 Sociology G2 Introduction to population and society	1) Students can able to understand and study different theories concept related to population like Mathusian theory Demographic theory
SYBA Sem-II 24373 Sociology G2 population and Indian society	1) Understand the importance of population studies for policy and shaped the discipline.
TYBA Sem V	

Crime and Society (G-3)	1) The course will enable student to understand sociological dimensions of crime 2)Students will be capable of studying causes and consequences of crime and measures to control them.
TYBA Sem VI **Introduction to Human right and Social justice (G-3)**	1) Help students to well about which are basic concepts of human rights and social justice. 2) information about Indian Constitution. 3) Students get awareness about emergence about contemporary issues.
TYBA Sem V **Fundamental principles of social research** **(S-3)**	1) It will build an understanding on basics of social research methodology. 2) It will engage students to cultivate research skills as essential in sociology. 3) It will cultivate understanding and skills of social research step by step. 4) provides deeper knowledge of research and various perspectives and approaches in social research. 5) It will prepare students to think about sociological study in a practical manner.
TYBA Sem VI **Techniqu of social research(S-3)**	1)students understand difference between quantitative and qualitative research. 2) students get knowledge about survey method and case study. 3) Here students understand how to data analysis and how to write report writing.
TYBA Sem V **(S-4)** **Contemporary Indian Society**	1) Students enable to understand the evolution, scope and significance of international relations. 2) Students enable to demonstrate an understanding of: the key historical events and also they enable to understand and contemporary international system; and the key actors which shaped the international Politics. 3) Students enable to discuss the main international relations theories. 4) Students enable to analyze importance of International relation in process of nation progress. 5) Students enable to appreciate the foreign policy their determinants features and its relevance.
TYBA Sem VI **(S-4)** **Indian Society Challenge and changes**	1) It is help students to understand which are civic issues. 2) Students get knowledge about Media and democracy in India. 3) Students get awareness about Health system in India and also about quantity ,quality and equality in India.
TYBA Sem V **Academic writing and research project**	1) Here students to get knowledge about how to make project work.
TYBA Sem VI	1) Students understand about crime and types of crimes i.e child crimes.

Understanding and Mitigating violance	domestic violence. 2) Students get information about NGO.

Department of Anthropology

Course Outcome (Anthropology):

FYBA Sem-I 11191 **ANTHROPOLOGY G1** **Introduction to social-cultral Anthropology**	1) Explain the concept of Tribal people 2) Student are able to understand the concept of Tribal
FYBA Sem-II 11192 **ANTHROPOLOGY G1** **Introduction to Cultural and social Organization**	1) Students are able to understand Family system the tribal people 2) Richeval life and culture is studed by the students 3) Students are able to understand kinship clan. 4) Students got over all understand knowledge about life of tribal people. 5) Students are able to understand tribal Organazation.
SYBA Sem-I 23193 **ANTHROPOLOGY G2** **Indian Tribes**	1) Students got the knowledge of different type of shedul tribe. 2) Students understand tribe area as well as various types of tribal. 3)Stuents learn about new education system youthdormitories of tribes.
SYBA Sem-II 24194 **Tribal Development** **ANTHROPOLOGY G2 I**	1) Students will aware of various problem of tribal people 2) Student will able to understand tribal development . 3) Stuents got the knowledge different program run tribal
TYBA 3197 **ANTHROPOLOGY G3** **Maharashtra A culture Region**	1)Student will able to studied Maharashtra as culture region 2)) Students are able to understand the infulense of social educational reform and political movement up. 3)Students understand the saint –poets and sent traditional for Maharashra from Dyaneswar Tukaram.

Department of History

Programme Specific Outcome (History):

PSO1	Enable the students to understand background of our religion.
PSO2	Enable the students to produce their own historical analysis of documents and develop the ability to think critically and historically.
PSO3	It will help students in discussion and to understand different peoples and cultures in past environments and how those cultures changed over the course of the centuries.
PSO4	To develop students interests in the study of history and activities relating to history. They are: • (a) Collect ancient arts, old coins and other historical materials; • (b) Participate in historical drama and historical occasions; • (c) Visit places of historical interests, archaeological sites, museums and archives; • (d) Read historical documents, maps, charts etc. • (e) Play active roles in activities of the historical organizations and associations; and • (f) Write articles on historical topics
PSO5	Enables the students to research on unidentified topics related to history.

Course Outcome (Sociology):

FYBA History General Paper-11171 (Semester 1) Early India :From Prehistory to the Age of the Maury's	1. Learn innovative study techniques in the study of History of Ancient India to make it value based, conceptual and thought Provocative.
	2. Understand the importance of past in Exploration of present context.
	3. Understand the Socio –economic, cultural and architecture background of age of the Mauryas.
	4. Acquire the spirit of healthy Secularism among the student.
FYBA History General Paper-11172 (Semester II) Early India :Post Mauryan to the Age of the Rashtrakuta	1. Learn innovative study techniques in the study of History of Ancient India to make it value based, conceptual and thought Provocative.
	2. Understand the importance of past in Exploration of present context.
	3. Understand the Socio –economic, cultural and political and architecture background of Post Mauryan to the Age of the Rashtrakuta
	4. Acquire knowledge of various Empire after the age of Mouryas.
SYBA History General Paper-II (G2) No-23174- Sem-III **History of the Marathas (1630-1707)**	1. Student will develop the ability to analyses sources for Maratha History. 2. Student will learn significance of regional history and political foundation of the region. 3. It will enhance student's perception of 17th century Maharashtra and India in context of Maratha history. 4. Appreciate the skills of leadership and the administrative system of the Marathas.

SYBA History General Paper-II (G2) No-24174- Sem-IV **History of the Marathas (1707-1818)**	1. Students will be able to analyze the Marathas policy of expansionism and its consequences. 2. They will understand the role played by the Marathas in the 18th century India. 3. They will be acquainted with the art of diplomacy in the Deccan region. 4. It will help to enrich the knowledge of the administrative skills and profundity of diplomacy
SYBA History Special Paper-I (S1) No-23171- Sem-III **Medieval India-Sultanate Period**	1. Provides examples of sources used to study various periods in history. 2. Relates key historical developments during medieval period occurring in one place with another. 3. Analyses socio - political and economic changes during medieval period 4. Estimate the foreign invasion and the achievement of rulers
SYBA History Special Paper-I (S1) No-24171- Sem-IV **Medieval India-Mughal Period**	1. Draws comparisons between policies of different rulers. 2. Understanding Role of Akbar in the consolidation of Mughal rule in India. 3. Understand Aurangzeb's conflict with Rajput as, Maratha and weakening Mughals age. 4. Analyses factors which led to the emergence of new religious ideas and movements (bhakti and Sufi
SYBA History Special Paper-II (S2) No-23172- Sem-III **Glimpses of the Modern World. Part-1**	1. It will enable students to develop the overall understanding of the Modern World. **2.** The students will get acquainted with the Renaissance, major political, socio-religious and economic developments during the Modern World. **3.** It will enhance their perception of the history of the Modern World. **4.** It will enable students to understand the significance of the intellectual, economic, political developments in the Modern World.
SYBA History Special Paper-II (S2) No-24172- Sem-IV Glimpses of the Modern World. Part-1I	1. It will enable students to develop the overall understanding of the Modern World. **2.** Students will get acquainted with the major nationalist movements, the World War II and its consequences, the Cold War and its Consequences. **3**. It will enhance students overall perception of the history of the Modern World. **4.** It will enable students to understand the significance of the strategic political developments in the Modern World.

SYBA History **Skill Enhancement Course No-23176-Sem-III** **Art and Architecture of Early India** **(From 3000 B.C. to 12th Century A.D.)**	1. Students will get an overall understanding of the emergence and development of the art and architecture in Early India. 2. They will understand the emergence of the Pottery, Terracotta figures, Ornaments, Town Planning, preparation of seals and coins. 3. They will have an understanding of the art and architecture in early India.
SYBA History **No-24176-Sem-IV** **Medieval Indian Arts and Architecture(1206 To 1857)**	1. Students will get an overall understanding of the development of the Medieval Art and Architecture. 2. They will understand the changing patterns of the Art and Architecture during the Medieval India. 3. They will have an understanding of the impact of Persian Art on Islamic Art and Architecture in Medieval India.
TYBA History General Paper III (G3) **Sem-V-35174** **Indian National Movement (1885-1947)**	1. It will enable students to develop an overall understanding of Modern India. 2. It will increase the spirit of healthy Nationalism, Democratic Values and Secularism among the Students. 3. Students will understand various aspects of the Indian Independence Movement and the creation of Modern India.
TYBA History General Paper III-(G3) **Sem-VI-36174** **India After Independence(1947-1991)**	1. It will enable students to develop an overall understanding of the Contemporary India. 2. To increase the spirit of healthy Nationalism, Democratic Values and Secularism among the students. 3. Students will understand various aspects of India's domestic and foreign policies that shaped Post-Independence India.
TYBA History Special Paper III (S3) **Sem-V-35174** **Introduction to Historiography**	1. Students will be introduced to the information and importance of Historiography. 2. Students will be introduced to the different Methods and Tools of data collection. 3. Students can study the interdisciplinary approach of History. 4. Students will learn about the usefulness of History in the 21st century, its changing perspectives, the new ideas that have been invented, and the importance of History in a competitive World.

TYBA History Special Paper III (S3) Sem-VI-36171 **Applied History**	1. Students will be introduced to the information and importance of applied history. 2. Student will learn about the Historical significance of Archaeology and Archives and opportunities in the field of Archaeology and Archives. 3. Through this course, students will be informed about the opportunities in the field of Media, Museums. 4. Students will develops Research ability
TYBA History Special Paper III (S4) Sem-V-35172 **Maharashtra in the 19th Century**	1. Student will develop the ability to analyses sources for 19th century Maharashtra History. 2. Student will learn significance of Regional History and Socio-religious reformism foundation of the region. 3. It will enhance their perception of 19th Century Maharashtra. 4. Appreciate the skills of leadership and the Socio-religious System of the Maharashtra.
TYBA History Special Paper III (S4) Sem-VI-36172 History of Maharashtra in the 20thCentury	1. Student will develop the ability to analyses sources for 20th Century Maharashtra History. 2. Student will learn significance of regional history and Socio-Religious Reformism foundation of the region. 3. It will enhance their Perception of 20th Century Maharashtra. 4. Appreciate the skills of leadership and the Socio-Religious System of the Maharashtra.
TYBA History Skill Enhancement Course Sem-V -35176 South Indian Art and Architecture	1. Students will get an overall understanding of the development of the Art and Architecture in South India. 2. They will understand the changing patterns of the Art and Architecture in South India. 3. They will understand the impact of Persian Art on Islamic Art and Architecture in South India

TYBA History **Skill Enhancement Course** **Sem-VI** **-36176** **Heritage Management**	1. Student will understand over all process of Heritage Management 2. Student will get the knowledge about scope and the fact of Heritage Management. 3. The students will enable to understand about legal and commercial framework of Heritage

Department of Geography

Programme Specific Outcome BA (Geography):

PSO1:	Students will understand the fundamental concepts of Geography. This course will help the students to outline the both the Earth systems and Social issues in Physical Geography and Human Geography respectively.
PSO2:	The Physical geography course explains the evolution of Earth, its atmosphere, Interior structure of the Earth and Hydrological cycle to the students. In Human Geography students are introduced with the distribution of population, urban and rural settlements and agriculture in India.
PSO3:	Students will be able to survey the land with the help of Plain table and Prismatic Compass. Surveying and Creation of Maps are the important skill in Geography and in this course student will be able to sketch and construct the Maps of their study area.
PSO4:	Students will be aware of the environmental issues such as air, water and land pollutions. In this course students are motivated towards solution orientated study of the environmental problems.
PSO5:	Geography of Maharashtra describes the Geographical, Economical and Cultural settings of the Maharashtra state to the students taken geography as their special subject.
PSO6:	Students will learn the regional geography of India in which cultural and natural regions of the country will be discussed in detail.
PSO7:	Agriculture is the most important activity in India. In this course students learn the distribution of agriculture and agricultural problems in the country.
PSO8:	The Geography special level students will be able to identify the physical and cultural features in topographic maps and also read the weather maps. Students are also introduced with the Geographical Information System (GIS) and Remote Sensing techniques and its application in geography.
PSO9:	The course will provide the practical knowledge of geography subject to the students. In this course geography students will be able to do the data collection, statistical analysis of the data and representation of the results in the form of graphs and tables.

Course Outcome (Geography):

F.Y.B.A. **SEM I** **Gg- 110 (A)** **Physical Geography**	• Students will be introduced to the basic concepts in Physical Geography. • This course will describe the introduction of physical geography, origin of atmosphere, hydrological cycle etc. to the students. • Students will learn the composition of atmosphere.
F.Y.B.A. **SEM II** **Gg- 110 (B)** **Human Geography**	• Students will be introduced to the basic concepts in Human Geography. • Students will learn the population growth theories and can analyze the global population trends. • Students will be able to describe the basics of human geography such as population, settlement, agriculture etc.
F.Y. B.Sc. **SEM I**	• Students will be introduced to the Physical geography and its branches. • Geomorphology and its application, Interior of the Earth, Plate

GG 111 Introduction to Physical Geography–I (Geomorphology)	tectonics will be discussed in the class. • Student will be able to classify the geomorphic processes such as weathering, mass movement, erosion, deposition etc.
F.Y. B.Sc. GG112 Introduction to Physical Geography -II (Geography of Atmosphere and Hydrosphere)	• Students will learn the composition of atmosphere its characteristics. • This course will describe the introduction of physical geography, origin of atmosphere, hydrological cycle etc. to the students. • Students will learn the movements of ocean water.
GG 113 Practicals in Physical Geography	• Students will learn the Map and map scales used in Geography. • Students will learn and draw the map projections. • Students will use the thematic maps for data representations. • Students will visit a for data collection and report writing.
SEM II GG 121 Introduction to Human Geography	• •Students will be introduced to the basic concepts in Human Geography and its branches. • •Students will learn Human Evolution and Races. • •Students will learn the man-environment relation and economic activities of man.
GG 122 Population and Settlement Geography	• Students will be introduced to the basic concepts in Population Geography. • Students will learn the population growth theories and will analyze the global population trends. • Students will be able to describe the basics of human geography such as population, settlement, agriculture etc. • Student will classify the rural and urban settlement patterns.
GG 123 Practicals in Human Geography	• Students will calculate the different indices used in population geography. • Students will learn the cropping patterns used in the world. • Students will visit a place for survey and will write the report.
S.Y.B.A. SEM I Gg: 210(A) Environmental Geography I (G2)	• Students will learn the basic principles of environmental geography. • Students will apply the knowledge of environmental pollution and will aware the society. • Students will learn the earth ecosystem and its conservation.
Gg: 220(A) Geography of Maharashtra - I	• Students will learn the historical, political background of the Maharashtra state. • Students will discuss the Geology, Drainage, Soil Types, Climate and Resources of the Maharashtra. • Students will be able to list the resources present in the country.
Gg: 201(A) Practical	• Students will learn the basic concepts in practical geography. • Students will be able to do the conversions of the scale • Students will learn and able to draw the various projection used in

Geography – I (Scale and Map Projections)	geography.
SEC - A Introduction to Geographical Information System (GIS) /Applied Course of Disaster Management	• Students will learn the basic concepts of GIS and its applications. • Students will be aware of geospatial techniques used in geography. • Student will apply the theoretical knowledge of GIS in mapmaking practical by using GIS software.
SEM II Gg: 210(B) Environmental Geography II	• Students will be aware of dynamic environment on the Earth surface. • Student will list the global environmental problems. • Students will explore the knowledge of the available resources. • Students will be motivated towards the sustainable development.
Gg: 220(B) Geography of Maharashtra - II	• Students will be aware of the Agriculture troubles and scenario of Maharashtra • Students will be able to describe the population distribution and settlement pattern in Maharashtra. • Students will learn the Tourism activity in Maharashtra and the role of MTDC and Role of MIDC in industrial development in rural area of Maharashtra
Gg: 201(B) Practical Geography – II (Cartographic Techniques, Surveying and Excursion / Village / Project Report)	• Students will learn the basic and contemporary concepts in Cartography. • Students will draw the Projections and Cartographic Techniques used in geography. • Students will visit the geographical interested place and will make report or will be able to do the socio economic survey of the village.
SEC - B Introduction to Remote Sensing /Applied Course of Travel & Tourism	• Students will learn the basic concepts of Remote Sensing. • Students will learn the satellite image interpretation techniques. • Students will apply the image interpretation techniques to interpret the satellite images.
<u>T.Y.B.A. SEM V</u> **T.Y.B.A. General (G3)** Gg: 310 (A) Geography of Tourism –I • To introduce the basic concepts in Tourism Geography to students. • To understand the different types of Tourism. • To achieve the knowledge about different aspects of Tourism Geography. **T.Y.B.A Special 2(S3)** Gg: 320 (A) Geography of India –I	

- To explain the students with geography of our country.
- To make the student aware of the magnitude of troubles and scenario of our country.
- To help the students to know the relationship between the subject and the society.

T.Y.B.A Special 2(S4)
Gg: 301(A) Practical Geography – I (Techniques of Spatial Analysis)

- To introduce the basic concepts and techniques of Practical Geography.
- To introduce SOI toposheets to the students and obtain the knowledge of toposheet interpretation.
- To introduce the students with Weather Maps and acquire the Knowledge of its interpretation.

T.Y.B.A Special 2(Special Credit 2)
(Value/skill based course) Research Methodology – I

- To introduce the basic concept in research methodology.
- To make students to know the basic framework of sampling and data collection.
- To develop the understanding of a range of sampling methods and techniques used in Research.

T.Y.B.A. SEM VI

T.Y.B.A. General (G3)
Gg: 310(B) Geography of Tourism –II

- To know the history of Tourism.
- To introduce the basic concepts in Tourism Geography to the students.
- To know the different types of Tourism.

T.Y.B.A Special 2 (S3)
Gg: 320(B) Geography of India –II

- To acquaint the students with geography of our Nation.
- To help the students to understand the inter relationship between the subject and the society.
- To help the students to understand the recent trends in regional studied

T.Y.B.A Special 2 (S4)
Gg: 301(B) Practical Geography – II (Techniques of Spatial Analysis,
Surveying and Excursion / Village / Project Report)

- To introduce the students with Aerial Photographs, Satellite Images and obtain the knowledge to interpret.
- To explain students with the spatial and structural characteristics of Practical Geography.
- To make students understand the elementary and essential principles on field of practical work.

T.Y.B.A Special 2(Special Credit 2)
(Value/skill based course) Research Methodology – II

- To spot the various sources of information for data collection.
- Understanding of the conducting various surveys on various issues and develop the Report

writing skill of students.
- To make students understand the research report writing.

M.A./M.Sc. Geography SEM-I

GGUT-111 Principles of Geomorphology
- Students will be introduced the geomorphological landforms and processes on the earth surface.
- Students will able to distinguish between the denudation processes on the earth.
- Students will list the erosional and depositional landforms created by different agents like wind, water, sea waves and ground water.

GGUT-112 Principles of Climatology
- Student will understand the climatic phenomena.
- Student will identify that how climatic phenomena affect on human society & occupation.
- Students will categories the Problem related to climate.

GGUT-113 Principles of Economic Geography
- Students will aware about knowledge of natural resources
- Students are introduced to the sustainable development to enrich their knowledge.
- Students will get to know about need of new green revolution in India.
- Students will be able to analysis economical problems and prospects.

GGDT-114 Principles of Population and Settlement Geography
- Students will apply census data to estimate the composition of the population.
- Student will apply census data to estimate population structure and characteristics.
- Student will identify population growth and trend in India.

GGUP-115 Practical in Physical and Human Geography
- Students are introduced about stream orders in Drainage network.
- Students will able to classify climate of atmosphere
- Students will examine and will be able to calculate demographic parameters such as fertility rate, infant mortality rate etc.

Programme Specific Outcome MA (Geography):

PSO1:	Master students of geography will be introduced to the Geomorphological settings of the earth, Atmosphere and Climate of the earth, Theories economic and population geography.
PSO2:	Students will be able to draw the drainage network of river, cross profile, wind rose, climatograph etc. Apart from the representation and interpretation of the geographical data this course also offers a field visit and students are required to submit the reports of the field visit.
PSO3:	Both Theory and practical course of GIS and Remote Sensing is offered to the students. A student applies the GIS and Remote Sensing skills and constructs the map

	to represent the physical and cultural features on the earth surface.
PSO4:	Distribution of population and resources, various concepts and indices of population studies and rural-urban settlements are taught to the students in the population geography course.
PSO5:	Master students of geography are introduced to the statistical techniques which are required to solve the challenges in the geographical data computations and analysis.
PSO6:	Students learn the distribution of the soil types, soil fertility, soil degradation and soil conservation techniques in the soil geography course.
PSO7:	The course, Geographical Thoughts describes development of the geography subject over the years and promotes the group discussion and research work for the development of the geography subject.
PSO8:	Village surveys are the part of curriculum, students visit the villages and collects the data by using questionnaire and after the analysis submits the survey reports to the department. This course gives surveying demonstrations to the students.
PSO9:	Dissertation is offers to the Master students in which they complete the small research work within four months in their last semester. This course provide healthy atmosphere for the research work in the department and students find this work helpful in their PhD or other career goals.

Course Outcome MA (Geography):

M.A./M.Sc. Geography SEM-I	
	•
GGUT-111 Principles of Geomorphology	• Students will be introduced the geomorphological landforms and processes on the earth surface. • Students will able to distinguish between the denudation processes on the earth. • Students will list the erosional and depositional landforms created by different agents like wind, water, sea waves and ground water.
GGUT-112 Principles of Climatology	• Student will understand the climatic phenomena. • Student will identify that how climatic phenomena affect on human society & occupation. • Students will categories the Problem related to climate.
GGUT-113 Principles of Economic Geography	• Students will aware about knowledge of natural resources • Students are introduced to the sustainable development to enrich their knowledge. • Students will get to know about need of new green revolution in India. • Students will be able to analysis economical problems and prospects.
GGUP-115 Practical in Physical and Human Geography	• Students are introduced about stream orders in Drainage network. • Students will able to classify climate of atmosphere • Students will examine and will be able to calculate demographic parameters such as fertility rate, infant mortality rate etc.
M.A./M.Sc. Geography SEM II	
GGUT-121 Geoinformatics – I	• Students will be able to define the Geoinformatics and application of GIS in geography. • Students will make a list of different types of database and data models

	used in geoinformatics. • Students will learn the application of GIS data and types of GIS data analysis.
GGUT-125 Population Geography	• Students will be able to classify the different population growth theories postulated by various geographers. • Students will figure out the applications of the population theories in different parts of the world. • Students will define and calculate the population characteristics such as fertility rate, mortality, population density etc.
GGUT-129 Geography of Rural Settlements	• Students will understand village structure & Morphology. • Students will analyse the rural problem. • Students will learn and apply techniques & skills for rural development.
GGDT-130 Geography of Tourism	• Student will learn the functioning of the Tourism Industries. • Students will understand types of tourism and will know the career opportunities in Tourism Industries. • Students will study the tourism in India and other case studies for the development of tourism.
GGDP-133 Practical in Map Projections	• Students will list the different types of projection are used to map the land surfaces around the world. • Student will be able to write the location extent of any country with the help of maps. • Students will learn and create the different projection used to draw the continents on the global maps.
GGUP-134 Practical of Statistical Techniques for Geography	• Students will understand the various statistical technique which is used in geography • Students will analyses statistical data. • Students will make a some conclusion for various problem with the help quantitative analysis.
M.A./M.Sc. Geography SEM-III	
GGUT-235 Geoinformatics-II	• Students will be introduced to the remote sensing techniques use to acquire the earth data. • Students will list the different institute's launches satellites to take the earth information. • Students will cover the theoretical parts of the GIS and Remote sensing techniques in this course and will learn practical more effectively.
GGUT-236 Geographical Thoughts	• Students will write the description of evolution of geography subject. • Students will promote toward the different approaches to study the geography. • This course will estimate the applications of geographical knowledge in various fields.
GGUT-236 Urban Geography	• Students will understand urban structure & Morphology. • Students will be able to figure out the problems in the urban

	settlements. • Students will do some project or draw some structure to learn the urban planning and development.
GGDT-237 Practical in Geoinformatics	• Students will interpret satellite images and recognized land use & land cover. • Students will apply GIS software for analyze raster & vector data. • Students will evaluate GIS database. • Students will acquaint the methods & tools of GIS.
GGDT-239 Watershed Management	• Students will examine geoenvironmental assessment of watershed management. • Student will invent plan of watershed management. • Student will identify watershed problems. • Student will categorize watershed types management policy.
GGUP-244 Practical in Population and Settlement Geography	• Students will classify in impact of pull and push factor in migration. • Students will analyses data of population • Students will examine rural urban composition of population
M.A./M.Sc. Geography SEM-IV	
GGUT-241 Geography of India	• Students of Geography will be introduced with geological structure. • Students will able to classify Distribution and utilization of minerals and energy resources. • Students will get to know about major project of India like Hydro electrical power, Thermal power, and Atomic power.
GGUT-242 Oceanography	• Students will be able to draw the structure of the oceans. • Students will be able to describe the ocean currents, tides, shores of the ocean etc. • Student will learn about the pollution in the oceans and possible solutions on this problem.
GGUT-252 Geography of Soils	• Students will learn the soil formation processes and the types of soil in India. • Students will classify the soil according to its capability. • Students will learn the soil pollution and can draw the soil conservation measures.
GGDP-256 Practical in Watershed Analysis	• Students will identify and delineate watershed using DEM & toposheets. • Student will analyze and evaluate the linear, aerial & relief properties of watershed. • Students will design maps using satellite images & aerial photographs.
GGUT-258 Geography of World	• Students will learn the theories behind the formation of the earth. • Students will define the different continents present on the earth surface and its physical properties. • Students will be introduced with the emerging challenges and

	opportunities in the 21th century.
GGUP-259 Dissertation/ Research Project	• Students will be introduced to the research in the geography. • Students will be motivated to select any geographically interested topics for research and will create a research thesis. • Through this course the students will be able to do the surveys, data collection, analysis of different database and research work.

PROGRAM OUTCOME
Faculty of Science

Program Outcomes (POs) for B.Sc Programme

PO1:	**Disciplinary Knowledge:** Demonstrate comprehensive knowledge of the disciplines that form a part of a graduate programme. Execute strong theoretical and practical understanding generated from the specific graduate programme in the area of work.
PO2:	**Critical Thinking and Problem solving:** Exhibit the skills of analysis, inference, interpretation and problem-solving by observing the situation closely and design the solutions.
PO3:	**Social competence:** Display the understanding, behavioural skills needed for successful social adaptation, work in groups, exhibit thoughts and ideas effectively in writing and orally.
PO4	**Research-related skills and Scientific temper:** Develop the working knowledge and applications of instrumentation and laboratory techniques. Able to apply skills to design and conduct independent experiments, interpret, establish hypothesis and inquisitiveness towards research.
PO5	**Trans-disciplinary knowledge:** Integrate different disciplines to uplift the domains of cognitive abilities and transcend beyond discipline-specific approaches to address a common problem.
PO6	**Personal and professional competence:** Performing dependently and also collaboratively as a part of a team to meet defined objectives and carry out work across interdisciplinary fields. Execute interpersonal relationships, self-motivation and adaptability skills and commit to professional ethics.
PO7	**Effective Citizenship and Ethics :** Demonstrate empathetic social concern and equity centred national development, and ability to act with an informed awareness of moral and ethical issues and commit to professional ethics and responsibility.
PO8	**Environment and Sustainability:** Understand the impact of the scientific solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO9	**Self-directed and Life-long learning:** Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.

Program Outcomes (POs) for M.Sc Programme

PO1:	**Disciplinary Knowledge:** Demonstrate comprehensive knowledge of the discipline that forms a part of a postgraduate programme. Execute strong theoretical and practical understanding generated from the specific programme in the area of work.
PO2:	**Critical Thinking and Problem solving:** Exhibit the skill of critical thinking and understand scientific texts and place scientific statements and themes in contexts and also evaluate them in terms of generic conventions. Identify the problem by observing the situation closely, take actions and apply lateral thinking and analytical skills to design the solutions.
PO3:	**Social competence:** Exhibit thoughts and ideas effectively in writing and orally; communicate with others using appropriate media, build effective interactive and presenting skills to meet global competencies. Elicit views of others, present complex information in a clear and concise way and help reach conclusions in group settings.
PO4	**Research-related skills and Scientific temper:** Infer scientific literature, build a sense of enquiry and able to formulate, test, analyse, interpret and establish hypothesis and research questions; and to identify and consult relevant sources to find answers. Plan and write a research paper/project while emphasizing on academics and research ethics, scientific conduct and creating awareness about intellectual property rights and issues of plagiarism.
PO5	**Trans-disciplinary knowledge:** Create new conceptual, theoretical and methodological understanding that integrates and transcends beyond discipline-specific approaches to address a common problem.
PO6	**Personal and professional competence:** Perform independently and also collaboratively as a part of a team to meet defined objectives and carry out work across interdisciplinary fields. Execute interpersonal relationships, self-motivation and adaptability skills and commit to professional ethics.
PO7	**Effective Citizenship and Ethics :** Demonstrate empathetic social concern and equity centred national development, and ability to act with an informed awareness of moral and ethical issues and commit to professional ethics and responsibility.
PO8	**Environment and Sustainability:** Understand the impact of the scientific solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO9	**Self-directed and Life-long learning:** Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.

Department of Chemistry

Programme Specific Outcome (Chemistry):

On the completion of B.Sc. Chemistry the students:

PSO1	Understand the scope, methodology and application of modem chemistry
PSO2	Study theoretical and practical concepts of instruments that are commonly used in most chemistry field.
PSO3	Plan and conduct scientific experiments and record the results of such experiments.
PSO4	Get acquaint with safety of chemicals, transfer, and measurement of chemicals, preparation of solutions, and using physical properties to identity compounds and chemical reactions.
PSO5	Describe how chemistry is useful to solve social, economic and environmental problem and issues facing our society in energy, medicine and health.

Course Outcome (Sociology):

F.Y.B.Sc. (Chemistry)	
1. Chemical Energetics	1. Students will be able to apply thermodynamic principles to physical and chemical process 2. Calculations of enthalpy, Bond energy, Bond dissociation energy, resonance energy 3. Variation of enthalpy with temperature –Kirchoff's equation **4.** Third law of thermodynamic and its applications
2. Chemical Equilibrium	Knowledge of Chemical equilibrium will make students to understand 1. Relation between Free energy and equilibrium and factors affecting on equilibrium constant. 2. Exergonic and endergonic reaction 3. Gas equilibrium , equilibrium constant and molecular interpretation of equilibrium constant 4. Van't Haff equation and its application
3. Ionic equilibria	Ionic equilibria chapter will led students to understand 1) Concept to ionization process occurred in acids, bases and pH scale 2) Related concepts such as Common ion effect hydrolysis constant, ionic product, solubility product 3) Degree of hydrolysis and pH for different salts , buffer solutions
1. Atomic Structure	1) Various theories and principles applied to revel atomic structure 2) Origin of quantum mechanics and its need to understand structure of hydrogen atom 3) Schrodinger equation for hydrogen atom 4) Radial and angular part of hydrogenic wave functions 5) Significance of quantum numbers 6) Shapes of orbitals

2. Periodicity of Elements	1) Rules for filling electrons in various orbitals. 2) Electronic configuration of an atom and anomalous electronic configurations. 3) Stability of half-filled and completely filled orbitals. 4) Concept of exchange energy and relative energies of atomic orbitals 5) Skeleton of long form of periodic table. 6) Block, group, modern periodic law and periodicity. 7) Classification of elements as main group, transition and inner transition elements 8) Name, symbol, electronic configuration, trends and properties. 9) Periodicity in the following properties in details: 10) Effective nuclear charge, shielding or screening effect; some numerical problems. 11) Atomic and ionic size. 12) Crystal and covalent radii 13) Ionization energies 14) Electronegativity- definition, trend, Pauling electronegativity scale. 15) Oxidation state of elements
3. Chemical Bonding	1) Attainment of stable electronic configurations 2) Types of chemical bonds- Ionic, covalent, coordinate and metallic bond 3) Ionic Bond- characteristics of ionic bond, types of ions, energy consideration in ionic bonding, lattice and solvation energy and their importance in the context of stability and solubility of ionic compounds, Born-Lande equation, Born-Haber cycle, Fajan's rule, bond moment, dipole moment and % ionic character. 4) Covalent bond- VB approach, Hybridization with example of linear, trigonal, square planer, tetrahedral, TBP, and octahedral. 5) VSEPR theory – assumption, need of theory, applications of 6) Concept of different types valence shell electron pairs and their contribution in bonding 7) Application of non-bonded lone pairs in shape of molecule 8) Basic understanding of geometry and effect of lone pairs with examples such as ClF3, Cl2O, BrF5, XeO3 and XeOF4.
4. Calculations used in Analytical Chemistry	1. Calculations of mole, molar concentrations and various units of concentrations which will be helpful for preparation of solution 2. Relation between molecular formula and empirical formula 3. Stoichiometric calculation
Course Outcomes Practicals **CH- 101: Physical Chemistry**	After completing the course work learner will be acquired with knowledge of chemical energetics,Chemical equilibrium and ionic equilibria.
CH- 102: Organic Chemistry	Will learn Fundamentals of organic chemistry, stereochemistry (Conformations, configurations and

	nomenclatures) and functional group approach for aliphatic hydrocarbons
CH- 201: Organic Chemistry	Will learn Fundamentals of organic chemistry, stereochemistry (Conformations, configurations and nomenclatures) and functional group approach for aliphatic hydrocarbons
CH- 201: Inorganic Chemistry	Students will learn quantum mechanical approach to atomic structure, Periodicity of elements, various theories for chemical bonding and calculations used in analytical chemistry
CH-202: Organic Chemistry	Students will learn Functional group approach for the various reactions (preparations & reactions) incontext to their structure
Lab Course CH 103 and CH-203	1. The practical course is in relevance to the theory courses to improve the Understanding of the concepts. 2. It would help in development of practical skills of the students. 3. Use of microscale techniques wherever required

S.Y.B.Sc. (Chemistry)

Course	Outcomes
CH-301 : Physical and Analytical Chemistry (Physical Chemistry)	• Concept of kinetics , terms used , rate laws , types of order Discuss examples of first order and second order reaction. Pseudo molecular reactions • Factors affecting on rate of reaction Techniques of measurement of rate of reaction • Know about photochemistry • Understand difference between thermal and photochemical reactions • Understand laws of photochemistry • Learn what is quantum yield and it's measurement • Know Types of photochemical reactions and photophysical process Know about quenching and chemiluminescent • Concept of distribution of solute amongst pair of immiscible solvents ii. Distribution law and it's thermodynamic proof • Distribution law and nature of solute in solution state iv. Application – Solvent extraction • Students should learn • What is Analytical Chemistry • Chemical analysis and its applications • Sampling • Common techniques • Instrumental methods and other techniques • Choice of method • Meaning of error and terms related to expression & estimation of errors

	• Methods of expressing accuracy and precision • Classification of errors • Significant figures and computations • Distribution of errors • Mean and standard deviations • Reliability of results Basic principles in qualitative analysis • Meaning of common ion effect • Role of common ion effect and solubility product • Different groups for basic radicals • Group reagent and precipitating agents
CH-302 : Inorganic and Organic Chemistry (Organic Chemistry)	• Students should be able to – • Identify chiral center in the given organic compounds. • Define Erythro, threo, meso, diasteroisomers with suitable examples. • Able to find R/S configuration in compounds containing two chiral centers. • Explain Bayer's strain theory, Heat of combustion and relates stability of cycloalkanes. • Explain the stability of cyclohexanes. • Draw the structure of boat and chair configuration of cyclohexane. • Draw axial and equatorial bonds in cyclohexane. • Draw structure of conformations of mono- & disubstituted cyclohexanes • Explain the stability of axial and equatorial conformation of monosubstituted • Cyclohexanes. Define and classify heterocyclic compounds. • Use Huckel rule to predict aromaticity. • Suggest synthetic route for preparation of various heterocyclic compounds. • Write and complete various reactions of heterocyclic compounds. • Predict products.

CH-302 : Inorganic and Organic Chemistry (Inorganic Chemistry)	• A student should be able – • To differentiate between ore and minerals. • To differentiate between calcination and roasting and smelting. • To know the different methods for separation of gangue or matrix from metallic compounds. • To know the terms smelting, flux. • A student should be able - • To know physico-chemical principles involved in electrometallurgy. • To understand electrolysis of alumina and its refining. • To explain the uses of Aluminum and its alloys. • To know purification of bauxite ore. To explain the term pyrometallurgy and to explain the physico chemical principles • involved in the reduction process by carbon monoxide. • To know different reactions in the blast furnace. • To differentiate between properties of pig iron and wrought iron. • To explain the basic principles of different methods for preparation of steel. • To explain the merits and demerits of different methods.
CH-301 : Physical and Analytical Chemistry (Analytical Chemistry)	• Meaning of equivalent weight, molecular weight, normality, molality, primary and secondary standards. • Different way to express concentrations of the solution. Preparation of standard solution. • To solve numerical problems. • Calibrate various apparatus such as burette, pipette, volumetric flask, barrel pipette etc. • Types instrumental and non instrumental analysis. Explain role of indicators. • Know mixed and universal indicators. • Know neutralization curves for various acid base titration • Know principle of complexometric precipitation and redox titrations. • Know the definitions and difference between iodometry and iodimetry. • To know standardization of sodium thiosulphate and EDTA. • Reactions between CuSO4 and Iodine and liberated I2 and Na2S2O3 • Choice of suitable indicator. • Estimate copper from CuSO4 and available chlorine in bleaching powder. • Prepare standard silver nitrate solution. • Mohr's and Fajan's method. • Determine the amount of halides separately and in presence of each other.

T.Y.B.ScChemistry (First Term)

Course	Outcomes
CH-501:Physical Chemistry	After studying this course, the student will be able to • Understand the term additive and constitutive properties. The term specific volume, molar volume and molar refraction.The meaning of electrical polarization of molecule, induced and orientation polarization. • Dipole moment and its experimental determination by temperature variation method. Electromagnetic spectrum, Nature of wave and its characteristics such as wavelength, wave number, frequency and velocity, Energy level diagram, • Classification of molecules on the basis of moment of Inertia, • Rotational spectra of rigid diatomic molecules, selection rules, nature of spectral lines. Simple Harmonic oscillator model, Born-Oppenheimer approximation. Vibrational spectra of diatomic molecules selection rules, nature of spectral lines.The difference between Rayleigh, Stokes and anti-Stokes lines in a Raman spectrum. • Justify the difference in intensity between Stokes and anti-Stokes lines. • Draw the Stokes and anti-Stokes lines in a Raman spectrum • \ Raman spectra: Concept of polarizability, Pure rotational Raman spectra of diatomic molecules, Energy Expression, Selection rule, • Rotational energy level diagram, Rotational Raman spectrum and Problems
CH-502: Analytical Chemistry	After completion of the course student should be able to • Define basic terms in gravimetry, spectrophotometry, qualitative analysis and parameters in instrumental analysis. Such as: Gravimetry, precipitation, solubility product, ionic product, common ion effect, precipitating agent, washing of ppt., drying and ignition of ppt., linearity range, detection limit, precision, accuracy, Sensitivity, Selectivity, Robustness and Ruggedness, electromagnetic radiations, spectrophotometry, Beers law, absorbance, transmittance, molar absorptivity, monochromator, wavelength of maximum absorbance. • Identify important parameters in analytical processes or estimations. Example: minimum analyte concentration in particular method, reagent concentration in particular analysis (gravimetry, spectrophotometry, thermogravimetry), reagent for particular analysis, reaction condition to convert analyte into measurable form, drying and ignition temperature for ppt in gravimetry, heating rate thermogravimetry, wavelength in

	spectrophotometry, group reagent, removal borate and phosphate in qualitative analysis. • Perform quantitative calculations depending upon equations student has studied I n the theory. Furthermore, student should able to solve problems on the basis of theory. . Discuss / Describe procedure for different types analyses included in the syllabus. Select particular method of analysis if analyte sample is given to him. Differentiate / distinguish / Compare among the different analytical terms, process and analytical methods.8. Demonstrate theoretical principles with help of practical. Design analytical procedure for given sample.
CH-504:Inorganic Chemistry	A student should know: • The assumptions and limitations ofVBT .Understand the need of concept of MOT. Know LCAO principal and itsapproximationUnderstand and show the formation of bonding and antibonding MO's .Draw the shapes of s, p, dorbitalDraw combinations of s-s, s-p, p-p and d-d orbital to form σ and π molecularorbitals. • The meaning of term f-block elements, Inner transition elements, lanthanides, actinides.Electronic configuration of lanthanides and actinides. Oxidation states of lanthanides and actinides and common oxidation states. Separation lanthanides by modern methods.. Lanthanide contraction and effects of lanthanide contraction on post-lanthanides. Use of lanthanide elements in different industries. Transuranic elements. Preparation methods of transuranic elements. Nuclear fuels and their application. • The difference between metal, semiconductor and insulator. Metallic bond on the basis of band theory. The energy band and energy curve.n and p type of semiconductors. Discovery and applications of superconductors.
CH-505: Industrial Chemistry	The students are expected to learn • Importance of chemical industry. Meaning of the terms involved, Comparison between batch and continuous process, Knowledge of various industrial aspects. Concept of basic chemicals, their uses and manufacturing process. They should also know the physico-chemical principals involved in manufacturing process. • Importance of sugar industry, Manufacture of direct iii. Consumption (plantation white) sugar with flow diagram.Cane juice extraction by various methods, Clarification by processes like

	carbonation, Sulphitation, .Phosphatation, etc. Concentration of juice by using multiple effect evaporator system,Crystallization of sucrose by using vacuum pan. • Importance, Basic requirement of fermentation process,Manufacturing of ethyl alcohol by using molasses and fruit juice. • Different types of soap products, Chemistry of soap. Raw materials required for soap manufacture • Meaning of the term's Surfactants, Types of surfactants. Raw materials for detergents. Detergent builders, additives ,Washing action of soap and detergents
CH-507:Organic Chemistry	• After studying the polynuclear and heteronuclear aromatic compounds, students will able to Define and classify polynuclear and hetreonuclear aromatic hydrocarbons. Write the structure, synthesis of polynuclear and hetreonuclear aromatic hydrocarbons. Understand the reactions and mechanisms. Explain the reactivity of polynuclear and hetreonuclear aromatic hydrocarbons. • Meaning of active methylene group. Reactivity of methylene group, Synthetic applications ethyl acetoacetate and malonic ester .To predict product with panning or supply the reagent/s for these reactions • Students will also learn about Elimination, different rearrangement reaction. • To predict product/s or supply the reagent/s for thesereactions • Different types of carbon-carbon unsaturatedcompounds • Orientation / rules in additionreactions • The structure of carbonylgroup • Reactivityconcept • Correct mechanism of addition reactions usingdifferent reagents • Types of some known additionreactions • To predict product/s or supply the reagent/s for suchreactions

CH-508: Chemistry of Biomolecules	The student will understand • Cell types,Biological composition and • Organization of cell membrane, structure and function of various cell organelles of plant and animal cell. Concepts of biomolecules • Types of carbohydrates, Lipids, Proteins, Amino acids and Enzymes • Basic concepts of Endocrinology. Types of Endocrine glands and their hormones. Biochemical nature of hormones. Mechanism of action of lipophilic and hydrophilic hormones
CH:510 (A): Introduction of Medicinal Chemistry	Upon completion of the course the student shall be able to understand, • The basics of medicinal chemistry, biophysical properties, overview of basic concepts of traditional systems of medicine. • Over view of the overall process of drug discovery, and the role played by medicinal chemistry in this process. • Biological activity parameters and importance of stereochemistry of drugs and receptors. Knowledge of mechanism of action of drugs belonging to the classes of infectious and non-infectious diseases.
CH-511 (A) : Environmental Chemistry	The students are expected to learn • Concept and scope of chemistry • Acquire Knowledge about water Pollution, Pollutants and various techniques of Analysis • Various Treatment Methods

TYBSC (Second Term)

Course	Outcomes
CH-601 : Physical Chemistry	After studying this topic students are expected to know and understand: • Distinguish between crystalline and amorphous solids / anisotropic and isotropic solids. • Explain the term crystallography and laws of crystallography. • Weiss and Millers Indices, determination of Miller Indices • Bravais lattices, space groups, seven crystal systems and fourteen Bravais lattices; • Cubic lattice and types of cubic lattice • Distance between the planes for 100, 110 and 111 for cubic lattice • Methods of Crystal structure analysis: The Laue method and Braggs method: Derivation • Bragg's equation, • Determination of crystal structure of NaCl by Bragg's method, • X ray analysis of NaCl crystal system and Calculation of d and λ for a crystal system, • Problems
CH-602 : Physical Chemistry	After studying this course students are expected to know • Meaning of the terms-Solution, electrolytes, nonelectrolytes and colligative properties, Lowering of vapour pressure of solvent in solution, Elevation of B.P. of solvent in solution, Landsberger's method, freezing point depression, Beckmann's method Osmosis and Osmotic pressure, Berkeley and Hartley method, Application of colligative properties to determine molecular weight of nonelectrolyte, abnormal molecular weight, Relation between Vant Hoff's factor and degree of dissociation of electrolyte bycolligative property, • Factors affecting on solid state reactions, Rate laws for reactions in solid state .Applying rate laws for solid state reactions. Results of kinetics studies • History of polymers. Classification of polymers .Chemical bonding & Molecular forces in Polymer. Molecular weight of polymers. Practical significance of polymer molecular weights. Molecular weight determination
CH-604 : Inorganic	Students should be able • To understand M-C bond and to define organometallic compounds , to

Chemistry	define organometallic chemistry • To understand the multiple bonding due to CO ligand.To know methods of synthesis of binary metal carbonyls. • To understand the structure and bonding using valence electron count (18 ele. rule) To understand the catalytic properties of binary metal carbonyls. To understand the uses of organometallic compounds in the homogenous catalysis. Chemistry of ferrocene • Understand the phenomenon of catalysis, its basic principles and terminologies,differentiate homogeneous and heterogeneous catalysis,brief account of homogeneous catalysts.Understand the essential properties of homogeneous catalysts,examples of heterogeneous catalysts. Understand the classification and essential properties of heterogeneous catalysts. • Identify the biological role of inorganic ions & compounds. Know the abundance of elements in living system and earth crust. Classification of metals as enzymatic and non-enzymatic. Understand the role of metals in non-enzymatic processes. Know the metalloproteins of iron. Explain the functions of hemoglobin and myoglobin in O2 transport and storage. Understand the toxicity of CN- and CO binding to Hb. the structure of Vit.B12 and give its metabolism.
CH-605: Inorganic Chemistry	Student will learn • The concept of acid base and their theories. They will also come to know different properties of acids and bases. Strength of various types acids. Know the nature of solids. Know the crystal structures of solids. • Be able to define Pauling's univalent radius and crystal radius. Able to solve simple problems based on Pauling's univalent radii and crystal radii. Know how to draw Born-Haber cycle. Able to solve simple problems based on Born- Haber cycle. Know the defects in Ionic solids. • Different Zeolite Framework Types and their classification. Zeolite synthesis and their structure. Application of zeolites • Various methods of nanoparticle synthesis. Stabilization of Nanoparticles in solution. Properties and Application of Nanoparticles.Know about carbon nanotube and its application. • Toxic chemical in the environment. Know the impact of toxic chemicals on enzyme. Know the biochemical effect of Arsenic, Cd, Pb, Hg. Explain biological methylation.
CH-607: Organic Chemistry	• Students will learn the interaction of radiations with matter. They will understand different regions of electromagnetic radiations. They will know different wave parameters.

	• Students will learn the principle of mass spectroscopy, its instrumentation and nature of mass spectrum.Students will understand the principle of UV spectroscopy and the nature of UV spectrum. They will learn types of electronic excitations. Students will be able to calculate maximum wavelength for any conjugated system. And from the value of λ-max they will be able to find out the extent of conjugation in the compound. • Students will understand the principle of IR spectroscopy, types of vibrations and the nature ofIR spectrum. Students will understand the principle of NMR spectroscopy and will understand variousterms used in NMR spectroscopy. They will learn measurement of chemical shift and coupling constants. Students will be able to interpret the NMR data and they will be able to use it for determination of structure of organic compounds. Students will be able to determine the structure of simple organic compounds on the basis of spectral data such as λ max values, IR frequencies, chemical shift (δ values).
CH-608: Organic Chemistry	Students should be able to learn about • . Retrosynthetic Analysis and Applications, Organic Reaction Mechanism and Synthetic Applications • Reagents in Organic Synthesis, Natural Products • Terpenoids: Introduction, Isolation, Classification. Citral- structure determination usingchemical and spectral methods, Synthesis of Citral by Barbier and Bouveault Synthesis. • Alkaloids: Introduction, extraction, Purification, Some examples of alkaloids and their natural resources. Ephedrine- structure determination using chemical methods
CH-610 (A) : Chemistry of Soil and Agrochemicals	Students will Know about • The different components and properties of soil.Classification of soil on the basis of pH..CanIdentify the problematic soil and recommend method for their reclamation.Tthe different plant nutrients required for plants and their functions. Know the role of various fertilizers and manures required for plant growth.The various methods and their techniques in analysis of soil.Importance of manures as compared to chemical fertilizers • Know various techniques to protect the plants.Have the

	knowledge of various pesticides, insecticides, fungicides and herbicides.
CH-611(A): Analytical Chemistry-	After completion of the course student should able to • Basic terms in solvent extraction, basics of chromatography, HPLC, GC, and AAS and AES. Some important terms are: solvent extraction, aqueous and organic phase, distribution ratio and coefficient, solute remain unextracted, percent extraction, ion association complex, theoretical plate, HETP, retention time, selectivity, resolution, stationary phase, normal and reverse phase, ion exchange, column efficiency, carrier gas, split and spitless injection, packed column, tubular column, atomic absorption and emission spectroscopy, electronic excitation in atoms, nebulization, atomization, reduction of metal ions in flame, absorbance by atoms in flame, flame atomizers, furnace atomizers, interference in AES and FES, HCL, hydride generator, etc

Course Outcomes Practical

- **Organic Chemistry-I**
- **Inorganic Chemistry-I**
- **Physical chemistry-I**

CSO-1 Learns the fundamentals of reaction mechanisms

CSO-2 Understands the mechanism of nucleophilic substitution and elimination reactions

CSO-3 Appreciates the fundamentals of aromaticity in organic chemistry

CSO-4 Acquires the 3-D aspects of organic molecules.

CSO-5 Gains the potential about complex vitamin and nucleic acid structure

CSO-1 Understands the background of bonding forces

CSO-2 Appreciates the importance of various theories in bonding

CSO-3 Learns the chemistry basis of solid state

CSO-4 Gains the imagination of 3D structures of silicates and caged compounds

CSO-5 Estimates the importance of extractive metallurgy

CSO-1 Understands the various theories of electrolytic conductance

CSO-2 Recognizes the dynamics of electrode reaction

CSO-3 Learns the classical status of thermodynamics

CSO-4 Appreciates the fundamentals of molecular thermodynamics

CSO-5 Estimates the basis of chemical surfaces Instrumental method of analysis

Inorganic practical-I

CSO-1 Analysis the variations of practical errors

CSO-2 Gains the potential about different precipitation processes

CSO-3 Determines the procedure for electro analytical techniques

CSO-4 Determines the procedure for thermo analytical techniques

CSO-5 Validates the strength of spectro analytical techniques

CSO-1 Determines the procedure for semi micro analysis of inorganic salt mixture

CSO-2 Understanding the procedure for semi micro qualitative analysis

CSO-3 Estimates the accurate analytical procedure of analysis

CSO-4 Appreciates the procedure for inorganic analysis

CSO-5 Learns the steps involved in the complex formation process

CSO-1 Understands the various source for collection of raw materials

CSO-2 Gains the importance about manufacturing process

CSO-3 Determines the necessity for small scale industries

CSO-4 Learns socio impact of sugar and agro chemicals

CSO-5 Validates the cause, consequence and control of pollution

Organic chemistry-II

Inorganic chemistry-II

Physical chemistry-II

CSO-1 Understands the basis of redox reaction

CSO-2 Appreciates the various steps involved in the molecular rearrangements

CSO-3 Visualizes the aromatic electrophilic substitution mechanism

CSO-4 Analyses the cruciality of the stereochemical process

CSO-5 Perceives the concept of conformational analysis

CSO-1 Learns the structure and properties of coordination compounds

CSO-2 Analyses the reaction pathways of complex formation

CSO-3 Validates the role of bioinorganic chemistry in every day action

CSO-4 Appreciates the vibrant role of catalysts in chemical reaction

CSO-5 Visualizes the energy behind the nuclear reaction

CSO-1 Learns the importance of chemical reaction against time

CSO-2 Validates the theoretical background of rotational spectra

CSO-3 Analyses the physical approach of IR and Raman spectra

CSO-4 Gains knowledge about NQR and ESR spectra

CSO-5 Encompasses the symmetrical utility of molecules

Organic practical-I

CSO-1 Learns principle of organic estimation

CSO-2 Gains the procedure for organic separation and derivation

CSO-3 Understands the method of organic preparation

CSO-4 Develops the various routes for recrystallization

CSO-5 Identifies the way for identification of components

M.Sc. Organic Chemistry

Programme specific outcomes:- A Student

PSO1	Gains complete knowledge about all fundamental aspects of all the elements of chemistry
PSO2	Understands the background of organic reaction mechanisms, complex chemical structures, Instrumental method of chemical analysis, molecular rearrangements and separation techniques.
PSO3	Appreciates the importance of various elements present in the periodic table, coordination chemistry and structure of molecules, properties of compounds, structural determination of complexes using theories and instruments.
PSO4	Gathers attention about the physical aspects of atomic structure, dual behaviour, reaction pathways with respect to time, various energy transformations, molecular assembly in nanolevel, significance of electrochemistry, molecular segregation using their symmetry.
PSO5	Learns about the potential uses of analytical industrial chemistry, medicinal chemistry and green chemistry.
PSO6	Carry out experiments in the area of organic analysis, estimation, separation, derivative process, inorganic semi micro analysis, preparation, conduct metric and potentiometer

Course Outcomes (COs):M.Sc.: Organic Chemistry

1. **Semester-I**
   1. CCTP-1:CHP-110 :Physical Chemistry-I
   (Fundamentals of Physical Chemistry)
   2. CCTP-2:CHI-130 : Inorganic Chemistry-I
   (Molecular Symmetry and Chemistry of Main Group Elements)
   3. CCTP-3:CHO-150 : Organic Chemistry-I :(Basic Organic Chemistry)
   4. CBOP-1 :CHG-190 :Section-I: General Chemistry-I, Theory Course
   Elective Option-A: Introduction to Solid State of Matter
   Section-II: General Chemistry Practical (Any one)
   5. CCPP-1 : CHP-107: Basic Practical Chemistry-I
2. Semester- II
   6. CCTP-4 : CHP-210 : Physical Chemistry - II
   (Molecular Spectroscopy and Nuclear Chemistry)
   7. CCTP-5 : CHI-230: Inorganic Chemistry -II
   (Coordination and Bioinorganic Chemistry)
   8. CCTP-6 : CHO-250 : Organic Chemistry-II
   (Photochemistry, Pericyclic and Organic spectroscopy)
   9. CBOP-2 : CHG-290 : Section-I: General Chemistry-II, Theory
   Elective Option-B : Organometallic and Inorganic Reaction Mechanism
   Section-II: General Chemistry, Practical (Any one option)
   Elective Option-A: Electroanalytical Techniques of Analysis
   10. CCPP-2 : CHP-227 Basic Practical Chemistry-II
3. Semester- III
   1. CCTP-7: CHO-350: Organic Reaction Mechanism and Biogenesis

2. CCTP-8: CHO-351: Structure Determination of Organic Compounds by Spectroscopic Methods
3. CCTP-9: CHO-352 :Stereochemistry and Asymmetric Synthesis of Organic Compounds.
4. CBOP-3: CHO-353: Theory: CHO-353-A) Protection - De-protection, Chiron approach and Carbohydrate Chemistry
5. CCPP-3: CHO-354 Practical I: Solvent Free Organic Synthesis

4. Semester- IV
   6. CCTP-10: CHO-450 Chemistry of Natural Products
   7. CCTP-11: CHO-451 Organometallic Reagents in Organic Synthesis
   8. CBOP-4: CHO-452: Theory: A) Medicinal Chemistry
   9. CBOP-5: CHO-453 Practical: Practical III: Select any two Sections
      Section-I: Ternary Mixture Separation
      Section-I: Carbohydrates Synthesis and Isolation of Natural Products
      Section-I: Project / Industrial Training/ Internships/Summer Project
   10. CCPP-4: CHO-454 Practical II: Convergent and Divergent Organic Syntheses.

1. Student should visualize/ imagine molecules in 3 dimensions.
2. To understand the concept of symmetry and able to pass various symmetry elements through the molecule.
3. Understand the concept and point group and apply it to molecules.
4. To understand product of symmetry operations.
5. To apply the concept of point group for determining optical activity and dipole moment.
6. Student should understand the importance of Orthogonality Theorem.
7. They should able to learn the rules for constructing character table.
8. Using reduction formulae should be able to find out the possible type of hybridization.
9. Student should know the concept of SALC.
10. Student able to find out character for reducible representation.
11. To know about projection operator.
12. Apply projection operator to find out the normalized wave function for atomic orbital.
13. Student should correlate the application of symmetry to spectroscopy.
14. Students able to find out the possible modes of vibration.
15. From the previous knowledge of symmetry student must able to find out which mode are IR active.

PSOs Students will be able to understand –

1. MOT and will be able to extend this in predicting reaction mechanism andstereochemistry of electrocyclic reactions

2. The concepts in free radical reactions, mechanism and the stereochemical outcomes.
3. The basic principle of spectroscopic methods and their applications in structure elucidation of organic compounds using given spectroscopic data or spectra.

Course Outcomes:

The goal of this course is to introduce students to fundamental concepts in Chemical Biology and methods of chemistry used to solve problems in molecular and cell biology. After completion of this course, successful students will:

1) Students will be able to explore new areas of research in both chemistry and allied fields of science and technology.

2) Students will be able to function as a member of an interdisciplinary problem solving team.

3) To impart the students thorough idea in the chemistry of carbohydrates, amino acids, proteins and nucleic acids etc.

4) Be able to describe the chemical basis for replication, transcription, translation and how each of these central processes can be expanded to include new chemical matter.

5) Develop skills to critically read the literature and effectively communicate research in a peer setting.

At the end of course student will understand / able to explain

1. Different characterization technique of solids.
2. Principle of XRD, instrumentation of powder XRD, Brags law, applications of XRDfor crystal structure determination, numerical problems.
3. Principle of SEM, instrumentation of SEM and interpretation of surface morphology of solid from SEM.
4. Principle of TEM, instrumentation of TEM and interpretation of TEM images.
5. Basics of X-rays, Principle of XRF, types of XRF, instrumentation, qualitative and quantitative analysis, numerical.

At the end of course students will able to explain

1. Valence electron count, back bonding in organometallics, spectral characterization of organometallic compounds.
2. Catalytic reaction involving organometallic compounds and mechanism of these reactions
3. Types of reaction involving organometallic compounds
4. Types of reactions in coordination compounds, inert and labile complexes, substitution reactions in coordination complexes and their mechanism, stereochemistry of reaction, kinetics of reactions.
5. The goal of this course is to introduce students to fundamental concepts in Chemical

Biology and methods of chemistry used to solve problems in molecular and cell biology.

6. Students will be able to explore new areas of research in both chemistry and allied fields of science and technology.
7. Students will be able to function as a member of an interdisciplinary problem solving team.
8. To impart the students thorough idea in the chemistry of carbohydrates, amino acids, proteins and nucleic acids etc.
9. Be able to describe the chemical basis for replication, transcription, translation and how each of these central processes can be expanded to include new chemical matter.
10. Develop skills to critically read the literature and effectively communicate research in a peer setting.
11. Describe the importance of chemical biology research and interdisciplinary work
12. This course is designed to make students aware of how to perform organic compounds in laboratory.
13. The course includes synthesis of some derivatives and organic compounds, which will help them while working in research laboratory in future.
14. Making derivatives of organic compounds will help them in industry or while doing research in medicinal chemistry for Drug development.
15. This practical course is also designed to make student aware of green chemistry and role of green chemistry in pollution reduction.
16. The students learn how to avoid solvents and do solvent free reaction.
17. Also the work-up procedure in many experiments is made more eco-friendly to environment.

Course Outcomes:

1. Students are trained to different purification techniques in organic chemistry like recrystallization, distillation, steam distillation and extraction.
2. Students are made aware of safety techniques and handling of chemicals.
3. Students are made aware of carrying out different types of reactions and their workup methods.
4. This practical course is designed to make student aware of green chemistry and role of green chemistry in pollution reduction.

Department of Botany

Programme Specific Outcome (Botany):

After successful completion of three-year degree program in Botany a student is able to;

PSO1:	Students would acquire fundamental Botanical knowledge through theory and practical's.
PSO2:	To explain basis plant of life, morphology, reproduction and their survival in nature.
PSO3	Help to understand role of living and fossil plants in our life.
PSO4	Understand good laboratory practices and safety.
PSO5	Students acquired knowledge through practical work in fields as well as in laboratory
PSO6	To create awareness about conservation and sustainable utilization of biodiversity.
PSO7	To know advance techniques in plant sciences like molecular, genetic, Phytoremediation, tissue culture, formulation of new herbal drugs, plant disease control, etc.
PSO8	Studentswill be able to start nursery, horticultural practices and seed production.

Course Outcome (Botany):

F. Y. B. Sc. (CBCS Pattern) Semester-I **PAPER-I BO-111: Plant life and utilization I**	• Understand difference between Higher cryptogams and Lower cryptogams. • Know the systematic, morphology and structure, of Algae. Understand the life cycle pattern of Algae. • Know the various types of lichen. • Understand general characters, reproduction of Fungi. • Understand the morphological diversity of Bryophytes. • Understand the economic importance of the Bryophytes.
Paper-II BO 112 Plant morphology and Anatomy	• Know the various concepts and methods in taxonomy. • Know the various parts of flowers. • Understand the types of fruits.
BO 113 Practical based on BO 111 & BO 112	• Study of life cycle of Spirogyra, *Agaricus* and *Riccia*. • Study of Lichens and its types. • Practical knowledge of mushroom cultivation • Basic Structure of monocot and dicot.
Semester-II: **Paper-I BO-121:**	• Know the evolutionary trends and affinities of living gymnosperms with respect to external and internal features • Know the economic importance of the gymnosperm and angiosperms.

Plant life and Utilization-II	
Paper- II BO 122 Principles of plant science	• Understand the process of translocation of solutes in plants. • Understand the factors affecting growth of plants. • Know the cell cycle process in plants. • Learn the Structure and types of DNA and RNA.
BO 123: Practical's based on BO 121	• Observe characteristic features of prokaryotic and eukaryotic plant cell. • Preparation of slides using onion root tips. • Study about chlorophyll-a and chlorophyll-b
S. Y. B. Sc. (CBCS Pattern) Semester-III Paper- I BO 231: Taxonomy of Angiosperms and Plant Ecology	• Trace the history of development of systems of classification emphasizing angiosperm taxa. • Understand various rules, principles and recommendations of plant nomenclature produces in plant identification. • Learn and understand about interdisciplinary approach of ecology. • Understand ecological grouping of the plants.
Paper- II BO 232: Plant Physiology	• Understand the process of translocation of solutes in plants • Know the nitrogen metabolism and its importance. • Know about phytohormones and vernalization in plants.
BO 233: Practical based on BO 231 & BO 232	• Know the morphological and reproductive characters of plant family. • Study about ecological adaptations in Hydrophytes and Xerophytes. • Demonstration of various instruments.
Semester IV: Paper- I BO 241: Plant Anatomy and Embryology	• Know Epidermal tissue system and Mechanical tissue system. • Understand the Microsporangium and male gametophyte. • Understand the Megasporangium and female gametophyte.
Paper- II BO 242: Plant Biotechnology	• Understand the principle and basic protocols for Plant Tissue Culture. • Know about the Genetic Engineering. • Know about the biofuel technology.
BO 243: Practical based on BO 241 & BO 242	• Understand various plant tissue. • Study the preparation of permanent slide. • Understand the Preparation & sterilization of MS medium. • Study about transgenic crops.

T. Y. B. Sc. (2013 Pattern) Semester-III **Paper- I: BO: 331 Cryptogamic Botany**	• Understand the cryptogamic diversity. • Know life cycle pattern of cryptogams. • Know economic importance of cryptogams. • .Know thallus structure and reproduction of algae, fungi, bryophytes and Pteridophytes.
Paper II: BO.332: Cell and Molecular Biology	• Gain knowledge about cell and its function. • Learn the scope and importance of molecular biology. • Understand ultra-structure of cell wall, plasma membrane and cell organelles. • Understand the biochemistry of cell. • Understand the biochemical nature of nucleic acid and their role in living systems.
Paper- III: BO: 333: Genetics and Evolution	• Understand the Mendelian and neo-Mendelian genetics. • Know about interaction of genes, multiple alleles and linkage and crossing over. • Know about sex linked inheritance, chromosomal aberrations. • Know the evolutionary sequence of various groups of plants.
Paper- IV: BO.334: Spermatophyta and Palaeobotany	• Understand the Systematic study of gymnosperms and angiosperms. • Understand the morphological and reproductive character of spermatophytic plant • To bring investigation of palaeobotanical study in India. • Know types of fossils, geological time scale.
Paper -V BO.335: Horticulture and Floriculture	• Understand economic importance of plant and plant product. • Know the methods of plant propagation. • Understand the fruit & vegetables production technology. • Understand the scope & importance of floriculture. • Understand the methods of cultivation of different flowering plants.
Paper VI: BO 336 – Computational Botany	• Understand the scope & importance of biostatistics. • Understand the scope and some basic commonly used terms like sampling, data, dispersion, population, central tendency etc. • Knowledge to apply statistical analysis to biological data for testing different hypothesis

Semester– IV **Paper- I: BO. 341: Plant Physiology and Biochemistry**	• Know scope and importance of plant physiology. • Understand plant & water relation. • Understand process of photosynthesis, C3, C4, CAM pathways. • Understand the process of respiration, growth and developmental process in plant. • Understand the biochemistry of cell. • Understand the different types of secondary metabolites.
Paper- II: BO.342: Plant Ecology and Biodiversity	• Know the biotic and abiotic components of ecosystem. • Food chain & food web in ecosystem. • Understand plant community & ecological adaptation in plants. • Scope, importance and management of biodiversity.
Paper- III BO.343: Plant Pathology	• Understand scope and importance of plant pathology. • Know disease cycle and disease development. • Know the effect of plant diseases on economy of crops. • They can identify the plant diseases like bacterial, nematodal, and fungal. • Know the disease forecasting. • Know the prevention and control measures of plant diseases.
Paper- IV: BO.344: Medicinal and Economic Botany	• Understand scope and importance of pharmacognosy. • Know the cultivation, collection, processing & importance of various herbal drugs. • Understand the scope of economic botany and ayurvedic pharmacy. • Know the botanical resources like non wood forest products.
Paper- V: BO. 345: Plant Biotechnology	• Understand the fundamental of recombinant DNA technology. • Understand tissue culture techniques. • Role of microbes in agriculture, medicine & industry. • Understand the concept of bioinformatics, genomics & proteomics. • Understand technical germplasm & cryopreservation.
Paper- VI: BO346: Plant Breeding and Seed Technology	• Understand the scope & importance of plant breeding. • Know the technique of production of new superior crop varieties. • Know the about heterosis, hybrid vigour etc. • Know the process of hybrid variety, development & their release. • Know about seed germination, processing, production, storing etc.

Practical- I BO.347: Practical's Based on BO.331, BO. 332, BO.341: & BO.345	Students Would understand; • The range of thallus structure in algae, fungi, bryophytes and pteridophytes. • Study of Chromosomes Morphology. • Estimation of Plant DNA by DPA Method • Extraction and estimation of RNA by Orcinol Method • Study photosynthetic pigments by TLC/Paper chromatography • Separation of amino acids by paper chromatography. • Principle working and uses of laminar air flow hood, autoclave, hot air oven, and centrifuge. • MS media preparation.
Practical- II BO. 348: Practical's based on BO.333, BO.334, BO.342& BO.346	Students Would understand; • Solving of problems on gene mapping using three-point test cross data • Study of the families with respect to morphological characters using botanical terms, floral formula, floral diagram and classification giving. • Study of *Pinus* & *Gnetum.* • Study of different types of fossils. • Demonstration of Hybridization Techniques. • Study of polluted water body with ref. to BOD. • Study the Polyploidy induction in Allium cepa by colchicine.
Practical- III. BO. 349: Practical's based on BO.335, BO.336, BO343 & BO.344	Students Would understand; • Study of Garden tools and Equipment's. • Study techniques in Horticulture and floriculture like cutting, Layering, Budding, Grafting. • Solving of problem on mean, mode, median, variance and standard deviation. • Study of Koch's Postulates. • Study the different Culture technique. • Study of Bacterial Disease w.r.t. Causal organism, Symptoms and control measures. • Study of viral diseases w.r.t. Causal organism and Symptoms. • Study of Plant extraction methods. • Study Qualitative analysis of Alkaloid, Glycoside and Tannin

T.Y.B.Sc Botany Course outcome
Semester - V

BO 351 Algae and Fungi

1. Learn about the thallus structure, pigmentation, food reserves and methods of reproduction of Algae.
2. Study about life cycle pattern of algae with reference to taxonomic position, Occurrence, Thallus structure, and reproduction of *Nostoc, Oedogonium Chara, Sargassum* and *Batrachospermum*.
3. Learn about the structure, pigmentation, food reserves and methods of reproduction of Fungi.
4. Study about of life cycle of fungi *Mucor (Zygomycotina), Saccharomyces (Ascomycotina), Puccinia (Basidiomycotina), Penecillium and Cercospore (Deuteromycotina)*
5. Know about the Economic importance of algae, Fungi
6. Learn about Symbiotic Associations - Lichens, Mycorrhiza and their significance.

BO 352 Archegoniate

1. Learn about the general characters, distribution and classification by G. M. Smith in Byophytes.
2. Know about the range of thallus organisation, origin of Bryophytes - Pteridophytes and Algal hypothesis, evolution of Sporophyte
3. Study about Life Cycle pattern of Bryophytes *Marchantia, Anthoceros and Funaria*.
4. Study of Life Cycle of Sporophytes and Gametophytes of *Psilotum, Selaginella* and *Equisetum*
5. Know about Ecological and economic importance of Bryophyte and Pteridophytes

BO 353: Spermatophyta and Paleobotany

1. Understand origin of Angiospem
2. Learn about concept speciation and endemism
3. Learn the types of Angiosperm classifications
4. Brief studied the economic products with special reference to the Botanical name, family, morphology of useful part and the uses
5. Gain brief knowledge about Herbaria and Botanical Gardens
6. Brief study about Introduction, general characters, economic importance and classification of Gymnospems according to Chamberlain (1934).

7. Detail study of life cycle of Pinus and Gnetum
8. Briefly studied on fossils

BO 354: Plant Ecology

1. Learn about concept of plant ecology, interrelationship between the living world and the
   Environment, Niche Concept
2. Detail study about the Biogeography
3. Know about the population and community ecology
4. Study in detail of Biogeochemical cycle
5. Learn about Ecological Impact Assessment (EIA)
6. Brief knowledge of Environmental Audit concept and process
7. Study about Remote Sensing and Ecological management

BO 355: Cell and Molecular Biology

1. Learn about brief introduction to Cell biology
2. Study about structure , function of various cell organelles
3. Learn about ulta structure of nucleus and chromosome
4. Understood cell signaling mechanism
5. Know about the genomic organization or living organisms, study of genes genome, chromosome etc.
6. Gain knowledge about the mechanism and essential component required for prokaryotic DNA replication.
7. Understand the fundamentals of gene expression and translation process.
8. The concept of operon and its structure and regulation.

BO 356: Genetics

1. Learn about introduction to genetics,
2. Know about Mendelian , Neo-mendelian genetics and multiple alleles
3. Understood the concept of linkage, recombination and crossing over

4. To study the phenomenon of Numerical and structural alternation of chromosome.
5. 6. To understand the mechanism of quantitative and cytoplasmic inheritance
6. Gain knowledge about the sex linked inheritance

BO 357: Practical based on BO351 and BO352

1. Student can classify and identify and described the Algal and fungal genus and specimen included.
2. Student can make micro preparation of the material of Bryophytes and identify them anatomically.
3. Student can make micro preparation of the material of Pteridophyte and identify them anatomically.
4. Study about stellar evolution in Pteridophytes

BO 358: Practical based on BO353 and BO354

1. Students will able to identify, classify and describe the include plant families
2. Understood preparation of Botanical Keys
3. Student can make micro preparation of the material of Gymnosperm and identify them anatomically.
4. Student able to identify and describe included fossil specimen.

BO 359: Practical based on BO355 and BO356

1. Student will be able to prepared of Fixatives and stains
2. Students can do cytological preparation observation of various stages
3. Students understood principle and performed experiments of DNA and RNA isolation by various
4. Student will also understand and solved problems based on Genetics methods

Skill Enhancement course

BO 3510: Medicinal Botany

1. Know about history and scope of medicinal botany
2. Learn about various medicine system Ayrveda ,Siddha and Unani
3. Understand the techniques for Conservation of endangered and endemic medicinal plants
4. Know the technique of medicinal gardening - Cultivation practices, marketing and utilization of selected medicinal plants
5. Know about Ethnobotany and Folk medicines

BO 3511: Plant Diversity and Human Health

1. Learn about plant diversity and Agrobiodiversity
2. Understood causes of loss of biodiversity
3. Know about the management of plant biodiversity
4. Learn about methods for conservation of biodiversity
5. Understood role of plants in relation to Human Welfare

(Semester VI)

BO 361: Plant Physiology and Metabolism

1. Know about the requirement of mineral nutrition for plant growth
2. Understand the process of Photosynthesis, Respiration
3. Learn about mechanism of stomatal bioloy and tranlocation of phloem
4. Know about the Plant Growth hormones (Auxins, Gibberellins. Cytokinins, Ethylene)
5. Understand the mechanism of photomorphogenesis.

BO 362: Biochemistry

1. Know about the foundation of biochemistry
2. Learn about physical & chemical properties, structure and function of water
3. Understand structure, classification, properties and functions of amino acids and proteins.
4. Understand the properties of Monosaccharides, Oligosaccharides and Polysaccharides.
5. They will learn about the Significance of Carbohydrates.
6. They will learn about the structure function and significance of lipids.
7. They will be able to understand Brief outline of enzymes and vitamins.

BO 363: Plant Pathology

1. Know about the fundamentals of plant pathology
2. Study of disease development process
3. Learn about the defense mechanism and methods of studying plant diseases
4. Study of fungal, mycoplasma, nematodal, viral, bacterial diseases and non parasitic diseases.
5. Understand the principles of plant diseases control

BO 364: Evolution and Population genetics

1. Learn about the process of organic evolution
2. Know about the concept and theories of organic evolution.
3. Study of evidences of evolution and evolution through ages.
4. Understand the concept of population and evolution
5. Study of speciation and isolation mechanism

BO 365: Advanced Plant Biotechnology

1. Learn about the introduction of biotechnology
2. Know about tissue culture techniques
3. Study about techniques of genetic engineering and methods of gene transfer in plants.
4. Understand the concept of cryopreservation and germplasm conservation.
5. Know about role of biotechnology in society and microbial biotechnology
6. Learn about the concept of transgenic plant and nano biotechnology

BO 366: Plant Breeding and Seed Technology

1. Know about the introduction of plant breeding.
2. Learn about the techniques and practices of plant breeding including plant introduction, selection methods and hybridization.
3. Study of advanced techniques in plant breeding.
4. Learn about introduction to seed technology seed legislation.
5. Know about seed production, certification, seed testing, seed pathology and seed storage.

BO 367: Practical based on BO361 and BO362

1. Students determine osmotic potential of cell sap by playmolysis
2. Students performed physiological practical concluded results
3. Learn about Demonstration experiments
4. Students performed biochemistry experiments.

BO 368: Practical based on BO363 and BO364

1. Students prepared tissue culture medium
2. Learn about diseases caused by fungal, bacterial, mycoplasma
3. Students know about types of fossils
4. Students solved problem based on population genetics.

BO 369: Practical based on BO365 and BO366

1. Students prepared MS medium and performed tissue culture practices
2. Know about demonstration to equipments used in genetic engineering
3. Students solved problems on genetic engineering
3. Learn about demonstration to fermentation
4. Performed practical synthesis of nano particles.
5. Learn about demonstration of Hybridization Techniques

Skill based course

BO 3610: Nursery and Gardening Management

1. Learn about nursery management
2. Know about vegetative methods of plant propagation
3. Study of gardening management

BO 3611: Biofertilizers

1. Know about the introduction of Biofertilizer.
2. Learn about bacterial and algal Biofertilizer
3. Study of Fungal Biofertilizer and compost and manure

M. Sc. Botany First Year Course Outcome

BOUT:111:- Botany Theory Paper 1-Plant Systematics I

1. Learn about concept and principle of systematic and taxonomy.
2. Know about Algal, Fungal and Bryophyte classification systems.
3. Study of algae with respect to algal habitats, Pigment constitution in algae, Reserve food, Modes of perennation in algae, Origin and evolution of sex.
4. Learn in details about Cynophyta, Cholophyta, Xanthophyta, Pheophyta and Rhodophyta.
5. Understand about application of Algae, Fungi and Bryophyte
6. Student learns about Thallus structure, Nutrition, Cell structure, Hyphal modifications in Fungi.
7. Know about Fungal classification as per Ainsworth et al system (1973)
8. Learn about the fungal division Myxomycotina, Mastigomycotina, Zygomycotina, Ascomycotina, Basidiomycotina and Deuteromycotina.
9. Study about Distribution, Distinguishing characters, morphology and anatomy of gametophyte and sporophytes of various orders included in Syllabus.

BOUT 112: Botany Theory Paper II- Cell Biology and Evolution

1. Learn about Dynamic organization of the cell
2. Kown about internal structure of the cell like cell wall, cell membrane, Biogenesis of various oraganelles
3. Study about cell signaling, transport and trafficking
4. Undestand about cellular process
5. Learn about theories of evolution
6. Study about origin of cell and cellular evolution
7. Understand concept of molecular evolution
8. Learn about paleontology and evolutionary history
9. Study about population genetics.

BOUT 113: Botany Theory Paper III-Cytogenetics and plant breeding1.

1. Students learn about Principles of Mendelian inheritance and Interaction of genes.
2. Underhand meachanism of Cytoplasmic and Quantitative inheritance.
3. Learn about the concept of linkage, recombination and crossing over.
4. understand about mutation, microbial genetics and cytogenetics

5. Know about Karyotype and chromosomal banding, structural and numerical alternation of chromosomes.
6. Study of introduction of plant breeding and plant genetic resources.
7. Learn about methods in plant breeding and asexual reproduction in plants.
8. Understand mutation breeding and breeding for nutritional trait.

BODT 114: Botany Theory paper 4-Biofertilizer and Algal Technology

1. Learn about introduction, concept and type and production of biofertilizers.
2. Undestand production technology of algal biofertilizers.
3. Know about the algal technology
4. Learn about algal base products

BODT 114: Botany Theory paper 4- Pomoculture and Fruit Processing Technology

1. Learn about introduction of pomology
2. Study about propagation methods of fruit plants.
3. Know about fruit processing techonology
4. Understand methods of food processing
5. Learn about fermentation products and byproduct waste utilization.

BODP 114: Botany practical based on BODT 114 Biofertilizer and Algal Technology

1. Students learn about Production method of biofertilizres.
2. Understand method of isolation of cynobacteria, Phosphate solubilising bacteria and root nodule Rahizobia.
3. Know about experimental method isolation of Spirulina and pure culture.
4. Study of production of algal fertilizers.

BODP 114: Botany practical 4 based on BODT 114 Pomoculture and Fruit Processing Technology

1. Study of growth and fruiting in cultivated fruit crop.
2. Learn about study methods of pruning and training of fruit crop, propagation of fruit trees, methods of harvesting.
3. Understand preparation methods of Jam, Jelly & Marmalade from Locally available fruits.
4. Prepare filed visit report on bases of observation at the field site.

BOUP 115: Botany practical paper based on BOUT 111, BOUT 112, and BOUT 113

1. Students identify and classify member from Charophyta, Euglenophyta, Bascilariophyta and Chrysophyta, Cyanophyta.
2. Learn about examples of Phaeophyta, Chlorophyta and Rhodophyta
3. Students identify and classify member from each Sub-divisions: Myxomycotina, Mastigomycotina and Zygomycotina.
4. Learn about morphological, anatomical and reproductive studies of the Hepaticopsida , Anthocerotopsida and Bryopsida members.
5. Students perform cell biology practicals
5. Learn about cytogenetics and plant breeding practicals.

Semester II

BOUT 121: Botany Theory Paper 1- Plant Systematics II

1. Learn about pteridophte with repect to Distinguishing Characters, Classification as per Sporne System (1975), Apospory, Apogamy, Stelar evolution, Heterospory and seed habit.
2. Study of orders Psilotales, Lycopodiales, Selaginellales, Isoetales, Equisetales, Ophioglossales, Marattiales, Osmundales, Filicales, Marsileales and Salviniales.
3. Know about various application of Pteridophytes.
4. Learn about classification, affinities with Angiosperm, distribution and economic aspect of Gymnosperm.
5. Study of various orders included in syllabus.
6. Understand Comparative account of morphology, anatomy, sporogenesis, gametogenesis, embryology, and interrelationship of Cycadales and Ginkgoales
7. Learn about Introduction, characters, classification system , phylogeny of angiosperm.
8. Study of plant families with respect to general characters, morphology, economic importance and affinities following Bentham and Hooker and APG system of classification.

BOUT 122: Botany Theory Paper II- Molecular Biology

1. Learn about various Techniques and Tools in Molecular Biology
2. Study about DNA structure function and damage
3. Know about the structure and function of gene
5. Learn about Gene Regulation: Concept and importance

6. Know about Transposable elements
7. Study of Genomics and Proteomics

BOUT 123: Botany Theory Paper III- Biochemistry

1. Learn about Fundamental aspect of biochemisty.
2. Study of various biomolecules.
3. Understand Protein biochemistry with respect to amino acids, protein
4. Learn about Enzymology and Nitrogen metabolism
5. Study of Phytochemistry and Metabolism with respect to over view of Primary and secondary metabolites.
6. Know about methods of phytochemical investigation.

BODT 124: Botany Theory paper 4- Floriculture and Nursery Management

1. Learn about the concept of floriculture, Pre-requisites of commercial floriculture.
2. Understand about harvesting and processing of flowers and Commercial production of flowers.
3. Know about Nursery management with respect to site slection, preparation
4. Study of production methods of various plants.

BODT 124: Botany Theory paper 4- Mushroom cultivation and Bio-pesticides

1. Learn about Mushroom cultivation
2. Know about nutritional value of Mushrooms.
3. Understand cultivation method of *Volvariella* , *Pleurotus* and Agaricus.
3. Learn about the concept Biological control of plant pathogens and antagonism
4. Know about Applications of biological control in field
5. Study of bacterial pesticides, Botanical pestisides and commercialization of biopesticides

BODP 124: Practical based on BODT 124 Floriculture and Nursery Management

1. Study of methods of post harvest technology for flower, different protective structures.
2. Preparation of project on Cut flower production including diseases and Pests management.
3. Study of grafting, budding and layering techniques

BODP 124: Practical based on BODT 124 Mushroom cultivation and bio-pesticides

1. Study of Morphology of any six mushrooms
2. Learn any six recipes of mushroom
3. Student Visit to mushroom industry and report preparation
4. Know about Mycofungicide and mycoherbicide

BOUP 125: Botany practical paper based on BOUT 121, BOUT 122, and BOUT 123

1. Studies on the families as per Bentham and Hooker's system of classification.
2. Learn about Morphological, anatomical and reproductive studies of Gymnosperm and Pteridophytes included.
3. Study of available fossils.
4. Students perform practical based on molecular biology.
5. Study of instruments or equipment's used in Molecular Biology techniques.
6. Students learn method of biochemistry practical included.

Department of Zoology

Programme specific outcome (Zoology):

After completing this students will be able to:

- **PSO1** - Understand the basic knowledge about cell biology, genetics, taxonomy, physiology, Biochemistry, ecology and applied Zoology
- **PSO2** – Get knowledge about animals and their ecosystems
- **PSO3** - Perform systems according to lab guidelines in the space of Taxonomy, Physiology, Ecology, Cell science, Genetics, Applied Zoology, Clinical science, devices and strategies of Zoology, Toxicology, Sericulture, Biochemistry, Fish science, Animal biotechnology, Immunology and exploration procedure
- **PSO4** – students can applied his Knowledge Zoology in Applied Zoology
- **PSO5** -Student will be able to recognize the relationship between structure and function at all levels of biological organization (e.g., molecules, cells, organs, organisms, populations, and species) for the major groups of animals.
- **PSO6** Student will be able to demonstrate the ability to read, understand, and critically review scientific information.

Course outcome

F. Y. B.Sc. Zoology Learning outcomes:

ZO-111,121: Animal diversity I and II

After successfully completing this course, students will be able to:

- **CO1:** To understand the Animal diversity around us.
- **CO2:** To understand the underlying principles of classification of animals.
- **CO3:** To classify invertebrates and to be able to understand the possible group of the invertebrate observed in nature.

ZO- 112: Animal Ecology

After successfully completing this course, students will be able to:

- **CO1**: Student will be able to identify and critically evaluate effects of population on ecosystem and Biosphere
- **CO2:** To understand importance of natural resource and aware about conservation of nature.
- **CO3:** The student understands the local lifestyle and problems of the community.

- **CO4:** Students can link food chains and the complexity of food networks and link them into human life for the improvement and non-utilization of biological and abiotic components.

ZO – 122: Cell Biology

After successfully completing this course, students will be able to:

- **CO1:** understand the importance of cell as a structural and functional unit of life.
- **CO2:** The student understands the difference between the prokaryotic and eukaryotic cell.
- **CO3:** get knowledge about the cellular mechanisms and its functioning

Course: Practical Zoology -I

After successfully completing this course, students will be able to:

- **CO1:** Recognize the live forms of vertebrates and invertebrates.
- **CO2:** Analyze and describe zoological concepts, including morphology and anatomy.
- **CO3:** Explain conservation and sustainable use of animals;
- **CO4:** Practical knowledge about Ecosystem

S. Y. B.Sc. Zoology

ZO 211, 221: Animal Systematics and Diversity –III & IV

After successfully completing this course, students will be able to:

- **CO1**- Knowledge of classification of Non-chordates along with studies on various physiological functions
- **CO2-** Knowledge of classification of chordates along with studies on various physiological functions and comparative anatomy of organs of chordate with example.

ZO 212, 222: Applied Zoology I & II

After successfully completing this course, students will be able to:

- **CO1**-Understands rearing of fish, sericulture, pearl culture along with crop pest management techniques so that he can start small scale livestock industry.
- **CO2-**Students gain knowledge about various disease related vectors and their impact on human
- **CO3**-Understands concepts of apiculture, poultry, dairy along with tissue and cell culture techniques

ZO 223: Practical course

After successfully completing this course, students will be able to:

- **CO1**-Basic knowledge about identification of non-chordate and chordate specimens (fresh and preserved) along with larval forms and study of endoskeleton of vertebrates

❖ **CO2:** Understand the nature and basic concepts of cell biology, genetics, taxonomy, physiology, ecology and applied Zoology

❖ **CO3:** Analyze the relationships among animals, plants and microbes

❖ **CO4:** Students will be able to explicate the ecological inter connected ness of life on earth by Tracing energy and nutrient flows through the environment. They will be able to relate the physical features of the environment to the structure of populations, communities, and ecosystems.

T. Y. B. Sc. Zoology

SEMESTER - V

ZO 351 - Pest Management

Course Outcomes:

CO1. Students will be able to understand pest management.

CO 2. Learns the economic, ecological, and sociological benefits of IPM.

CO 3. Students can distinguish positive and negative impacts of pesticide use.

CO 4. Understand problems resulting from misuse, overuse, and abuse of chemical pesticides.

CO 5. Students will be able to understand pesticide resistance and how it develops. CO6. Students will Identify ecological and biological characteristics important in development of pest populations.

CO 7. Students will Identify 10 tactics commonly used in IPM and be able to distinguish them.

CO 8. Understand society's role in IPM decisions.

CO 9. Describe different groups of pests and compare them to weeds and plant pathogens.

CO 10. Students will be able to analyse and compare management tactics to determine the best approach to reducing pest populations, weeds, and disease presence.

CO 11. Locate appropriate, scientifically valid sources of information on specific tactics to manage insect pests, weeds, and diseases.

CO 12. Know and how to develop an IPM program.

ZO 352 - Histology

Course Outcomes –

CO 1. The students will be able to understand, classify and identify the different types of tissue.

CO 2. The students will understand the complexity of various tissues in an organ.

CO 3. The students will be able to learn structure & functions of various tissues.

CO 4. The students will understand the various diseases related to organs.

CO 5. The student will be able to know the role of glands in mammals.

ZO 353 - Biological Chemistry

Course Outcomes -

CO1. Learners shall be able to understand basic concepts and significance of biochemistry

CO2. The students will learn about the pH and Buffers.

CO3. The students will learn about the chemical structures of carbohydrate, and their biological and clinical significance.

CO4. The students will be able to understand, interpret structure and importance of proteins, carbohydrates and lipids

CO5. Learners will be able to comprehend variations in enzyme activity and kinetics.

ZO 354 – Genetics

Course Outcomes-

- **CO1:** The students will be able to understand basic terms in genetics.
- **CO2:** The students will be able to understand Discuss the linkage groups and gene frequency.
- **CO3:** The students will be able to learn about the concept of mutation.
- **CO4:** The students will be able to understand the types of sex determination.
- **CO5:** The students will be able to learn about the human population genetics.
- **CO6:** The students will be able to understand the sex linked inheritance in human.
- **CO7:** The students will be able to learn about the applications of genetics.

ZO 355 - Developmental Biology

Course Outcomes-

- **CO1:** Students will be able to explain how organisms function at the level of the gene, genome, cell, tissue, organ and organ-system. Drawing upon this knowledge, they will be able to give specific examples of the physiological adaptations, development, reproduction and behavior of different forms of life.

- **CO2:** Describe the key events in early and systematic embryological development.
- **CO3:** Explain the theories of preformation, and concepts like growth, differentiation and reproduction.
- **CO4:** Explain the principles and process of fertilization and cleavage.
- **CO5:** Elucidation of early embryonic development of invertebrates and vertebrates.

ZO 356 - Parasitology

Course outcomes:

CO1. The students will be able to learn about basics and scope of parasitology.

CO2. The students will be able to learn the types of host and parasite with examples.

CO3. The students will be able to learn about the morphology, life cycle, pathogenicity and treatment of common parasites (Protists and Platyhelminthes).

CO4. The students will be able to learn about host -parasite relationships and their effects on host body.

CO5. The students will be able to learn about the arthropod parasites and their role as vector

ZO 3510: Aquarium Management

Course Outcomes-

CO1. The students will be able to understand the Aquarium fish keeping.

CO2. The students will able to understand the biology of aquarium fishes.

CO3. The students will be able to understand feeding requirements and food ingredients of aquarium fishes.

CO4. The students will be able to understand fish transportation techniques.

CO5. The students will be able to understand the maintenance of aquarium and physico-chemical parameters of water for fish culture

CO6. The students will be able to understand fish preservation and fish breeding techniques.

ZO – 3511 Poultry Management

Course Outcome:

CO1. The students will be able to understand the Poultry farming practices.

CO2. The students will able to understand the poultry breeding techniques.

CO3. The students will be able to understand poultry rearing techniques.

CO4. The students will be able to understand feeding requirement and food ingredients.

CO5. The students will be able to understand the poultry disease and their pathogens.

CO6. The students will be able to understand market value of poultry products

ZO 357, 358,359- Practical Paper I, II, III

Course outcomes-

After successfully completing this course, students will be able to:

- **CO1-** Students will able to understand various pests and their management.
- **CO2**-Students are able to handle microscopes, work with camera lucida and micrometers
- **CO3-** Students will able to prepare acid, alkali solutions and standardization.
- **CO4-** Students will gain skill about estimation and isolation of biochemicals.
- CO5- Students will able to find Mendelian ratios from given hypothetical data.
- **CO6-**Gain skill about histological slide preparation, staining and mounting
- **CO7**-Students gain skill about determination of pH and quantitative analysis of blood cells

❖ **CO8**-Students are able to find parasites from rectal and fecal contents of animals

❖ **CO9**-Students are able to collect parasite and pest specimen

SEMESTER - VI

ZO 361 - Medical & Forensic Zoology

Course Outcome

CO1. The students will be able to understand the basics principles of Medical and Forensic Zoology.

CO2. The students will able to understand scientific methods in crime detection.

CO3. The students will be able to understand the advancements in the field of Medical and Forensic Zoology.

CO4. The students will be able to understand modern tools, techniques and skills in forensic investigations.

CO5. The students will be able to describe the fundamental principles and functions of forensic science and its significance to human society.

ZO 362 - Animal Physiology

Course Outcomes:

Upon successful completion of this course, the students will be able to describe, identify, and/or explain:

CO1. The various physiological organ-systems and their importance to the integrative functions of the human body.

CO2. Understand Concept of energy requirements

CO3. Various aspects of Digestive physiology.

CO4. Circulatory system with medical conditions

CO5. Understand Respiratory mechanism and gases transport.

CO6. Eliminations of waste materials from the body.

CO7. Develop understanding in Structure and functions of muscles

CO8. Understand formation of gametes and function of endocrine glands.

ZO 363 - Molecular Biology

Course outcomes:

CO1. Learner shall get an insight into molecular mechanisms of various biological processes in cells and organisms

CO2. Learner shall get an insight into the Structure of DNA and RNA, DNA and RNA as genetic material

CO3. The course shall prepare learner to get insight into the Central Dogma of Molecular Biology

CO4. Learner shall also understand the concept of gene regulation

CO5. Learner shall get an insight into the DNA Damage and Repair

ZO 364 - Entomology

Course outcomes:

At the end of this course, Students will -

CO1. Understand basic concepts in Entomology and its scope.

CO2. Learn morphology and anatomy of Insects.

CO3. Understand the concept of social organization in Insects.

CO4. Understand the development process of Insects.

CO5. Identify disease causing insect vectors.

CO6. Will be able to design and implement pest controlling methods against pests

ZO 365 - Techniques in Biology

Course Outcomes-

- At the end of this course, Students will -

  CO1. Understand handling and basic principles of microscope.

- CO2. Understand tissue fixation and processing through microtomy.
- CO3. Learn haematological as well as immunological techniques.
- CO4. Understand PCR and DNA barcoding.
- CO5. Understand laboratory techniques and handling of instruments.

ZO 366 - Evolutionary Biology

Course outcomes

After completing the course, the student should be able to

CO1. Students will be able to learn most of the essential aspects of Evolutionary Biology in detail which will help them in acquiring better understanding regarding the subject.

CO2. Explain important processes, principles and concepts and critically evaluate theories and empirical research within evolutionary biology

CO3. Apply evolutionary theory and concepts to address empirical and theoretical questions in evolutionary biology.

CO4. Independently investigate evolutionary questions using literature and analyses of empirical data.

CO5. Communicate the principles, theories, problems and research results associated with questions that lie within the evolutionary framework to students.

ZO 3610 - Environmental Impact Assessment

Course Outcomes-

- After completing the course, the student should be able to
  CO1. Learn about environment and sustainable development.
- CO2. Understand types and effects of pollution.
- CO3. Understand environmental Protection acts.
- CO4. Understand environmental Impact Assessment.

ZO 3611 – Project

ZO 367, 368,369- Practical Paper I, II, III

- After successfully completing this course, students will be able to:
- **CO1-** Students will able to carry out urine analysis.
- **CO2**-Students are able to examine hair morphology and determine the species to which the hair belongs**CO3-** Students will able to prepare acid, alkali solutions and standardization.
- **CO4-** Students will gain skill about estimation of haemoglobin, blood glucose level, detection of blood groups.
- CO5- Students will able to prepare DNA paper model, estimation of DNA.
- **CO6**-Students will understand insect morphology and anatomy.
- **CO7**-Students gain skill about various biological techniques.
- CO8- Students will understand fossils, evolutionary stages of human.

C) Course outcome

M.Sc. Zoology Learning outcomes:

ZOUT 111 Biochemistry and Biochemical Techniques.

Semester I

Biochemistry

After successfully completing this course, students will be able to:

- **CO1**: Students will understand the applications of the various biochemical techniques.
- **CO2**: Get knowledge about the structure and functions of various biomolecules.
- **CO3**: Understand importance of tools and techniques in biology.
- **CO4:** Students will draw the structures of various carbohydrates and amino acids. Classify enzymes with examples.

Biochemical techniques**:**

- **CO1**: Students will understand the importance and applications of techniques in biochemistry.
- **CO2**: Get knowledge about the principle, working, materials used and applications of electrophoresis.
- **CO3**: Understand the importance of radioactive compounds and radioactivity in biology.
- **CO4**: Student will able to demonstrate the principle, working, applications of centrifugation, Warburg's apparatus, applications of radioactivity compounds in biology.

ZOUT 112 Cell Biology and Developmental Biology

After successfully completing this course, students will be able to:

Cell Biology:

- **CO1**: Students can label the various cell parts and sketch and label various types of cells and cell organelles.
- **CO2**: Students will learn as carbon as backbone of biomolecules and the concepts of cell signaling.
- **CO3**: Get knowledge about the ultra-structure and functions of various cell organelles.
- **CO4**: Understand the types, development and causes of tumor, the cell cycle phases and its regulation

Developmental Biology:

- **CO1**: Students will learn different terms in developmental biology
- **CO2**: Understand the significance of model organism for developmental studies, types of eggs, concept of fertilization and cleavage pattern.
- **CO3**: Get knowledge about concept of mesoderm induction and pattern formation with examples, neural competence and induction.
- **CO4**: Students will compare and contrast spermatogenesis and oogenesis.

ZOUT 113 Genetics and English in Scientific Communication.

After successfully completing this course, students will be able to:

Genetics:

- **CO1**: Students will understand the basic terminologies in genetics, concept of Mendelian genetics, gene, gene regulation and multiple alleles.
- **CO2**: Get knowledge about various genetic disorders based on karyotypes and traits.
- **CO3**: Get information about principles of Population genetics.

- **CO4**: Students can illustrate the modified Mendelian laws of inheritance.
- **CO5**: Able to identify the inheritance of qualitative and quantitative traits.

English in Scientific Communication:

- **CO1**: Students are able to write the outline of a scientific paper also write the title, abstract, discussion and citations of a given scientific article.
- **CO2**: Students can prepare a scientific presentation using PowerPoint.
- **CO3:** Students will understand language as a tool for effective scientific communication.
- **CO4**: students will learn the unique qualities of professional rhetoric and writing style, such as sentence conciseness, clarity, accuracy, honesty, avoiding wordiness or ambiguity, using direct order organization, readability, coherence and transitional devices.
- **CO5:** Understand the importance of plagiarism check and Proof-read given article.

ZODT 114 Freshwater Zoology.

After successfully completing this course, students will be able to:

- **CO1:** Students can enlist the diagnostic features of shrimps and the types of aquatic habitats.
- **CO2:** To understand the aquatic adaptations of common freshwater forms.
- **CO3**: To understand the adaptations in freshwater Turtles and Crocodiles
- **CO4**: Can illustrate the physicochemical properties of water, the effect of pollutants on freshwater bodies
- **CO5:** Get knowledge about the presence of zooplanktons and aquatics forms in freshwater bodies.

ZODP 114 Practical Freshwater Zoology.

After successfully completing this course, students will be able to:

- **CO1**: Identify commercially important freshwater fish.
- **CO2**: Identify the aquatic adaptations in common freshwater forms.
- **CO3**: Prepare the culture of *Paramecium* and *Daphnia.*
- **CO4:** Estimate the hardness and chloride content in water samples.
- **CO5**: Analyze the Zooplanktons from local freshwater bodies.
- **CO6**: Evaluate the bio-indicators of pollution in freshwater.

ZOUP 115 Basic Zoology Lab-1.

After successfully completing this course, students will be able to:

- **CO1**: Identify the developmental stages of chick embryo, cell structures and phases of cell division
- **CO2**: Identify the grammatical mistakes from the given paragraph and common errors in written and spoken presentations.
- **CO3:**Write a scientific project and research article along with its proof reading.
- **CO4**: Demonstrate the working of different microscopes, colorimetric and spectrophotometric methods, cell fractionation and ligature in *Drosophila* larvae,
- **CO5**:Determine the gene distance and order, genotype and phenotype ratios and allelic frequencies from the given data.
- **CO6**: Estimate sugar and protein by suitable biochemical method, and isolate protein from biological source.
- **CO7**: Prepare temporary slide of various cells to demonstrate the cell morphology and cell division, giant chromosome and pedigree analysis chart.

M.Sc. Zoology (Semester - 2)

Course Code and Course Name:

ZOUT 121: Molecular Biology and Bioinformatics.

Semester II

After successfully completing this course,: students will be able to

- **CO1**: students will be able to explain the DNA structure & types, topology, Physical properties; chromatin structure and organization.
- **CO2**: Understand genome organization, DNA and Protein sequencing with their application in evolutionary studies.
- **CO3:** Can explain the mobile DNA elements, mechanism of DNA damage and repair.
- **CO4**: Can explain the process of DNA replication, transcription, translation and their Regulations, schematically represent the processes of central dogma.

ZOUT 122 Endocrinology and Parasitology.

After successfully completing this course, students will be able to:

Endocrinology:

- **CO1**: Discuss the roles of Pituitary gland and pineal body and explain hormonal regulation of biomolecules and mineral metabolism.
- **CO2**: Students can describe the role of osmoregulatory and gastrointestinal hormones.

- **CO3**: Can explain the role of hormones in moulting, change in body colour of crustaceans; yolk synthesis in amphibians; insect development.
- **CO4**: Can explain the hormonal regulation of metabolism, the mechanism of hormone action and role of hormone receptors.

Parasitology:

- **CO1**: Students can understand the terminologies of parasitology, concepts of animal association with examples.
- **CO2**: Students can describe the role of parasites in public health and hygiene.
- **CO3**: Can explain the morphology and life cycle of common parasites, the pathogenicity and control measures of common parasites, the process of parasitic infections to human.
- **CO4**: Can understand the importance of control strategies against parasitic infections.

ZOUT 123 Comparative Animal Physiology & Environmental Biology.

After successfully completing this course, Students will

Comparative Animal Physiology:

- **CO1**: Students will able to explain the physiology of processes like digestion, respiration, muscle contraction and excretion.
- **CO2**: Can understand the mechanism of thermoregulation in both poikilotherms and homeotherms, the mechanism of chemical communication in vertebrates.
- **CO3:** Can comment on the structure and functions of various sense organs.
- **CO4**: Understand the survival strategies of organism in varied climatic conditions.

Environmental Biology:

- **CO1**: Students can list the endangered, endemic and extinct animal species of India, illustrate the wildlife management practices and their significance
- **CO2**: Students can identify various types of natural resources, human impact on these resources, and common resource management practices.
- **CO3**: Understand concepts in population ecology and their significance, environmental hazards and risks and the socio-economic implications. .

ZODT 124: Ichthyology

After successfully completing this course, students will be able to:

- **CO1**: Students can identify the common fishes in India and explain the general characters and evolution of fishes, the fish morphology and anatomical modifications.
- **CO2**: Can understand the physiology of reproductive and endocrine organs in fish.
- **CO3**: Understand the signs, symptoms and control measures of common diseases in fish.
- **CO4**: Able to setup aquarium and manage it.

ZOUP 125 Basic Zoology Lab-2

Semester II.

After successfully completing this course, students will be able to:

- **CO1**: Identify the various parasites and parasitic stages of common parasites, nitrogenous waste products of animals, freshwater planktons and slides of endocrine glands.
- **CO2**: Explain the principle and significance of gonadectomy, thyrodectomy and pancreactomy.
- **CO3**: Demonstrate the role of eye stalk and insulin in sugar level in crab.
- **CO4**: Demonstrate the retro cerebral complex in cockroach.
- **CO5**: Demonstrate the RBCs of common vertebrates and effect of various osmolarities.
- **CO6**: Demonstrate the effect of body size, oxygen consumption and Insulin on aquatic animal.
- **CO7**: Determine the bleeding and clotting time, heartbeat of crab, species richness in selected area, physico- chemical properties of soil and water.
- **CO8**: Perform Sterilization of lab equipment, prepare microbial culture, Isolate Bacterial, liver DNA and RNA from given sample, quantify and resolve them using electrophoretic procedures, analyse protein sample by PAGE and SDS PAGE and construct phylogenetic tree using tools in bioinformatics.

Department of Physics

Programme Specific Outcomes:

B.Sc. Physics and M.Sc. Physics would provide the opportunity to the students:

- to understand the concepts and significance of the various physical phenomena.
- to understand the basic concepts of methodology of science and the fundamentals of mechanics, properties of matter and electrodynamics.
- to understand the theoretical basis of quantum mechanics, relativistic physics, nuclear physics, optics, spectroscopy, solid state physics, astrophysics, statistical physics, photonics and thermodynamics
- to understand and apply the concepts of electronics in the designing of different analog and digital circuits.
- to apply the theories learnt and the skills acquired to solve real time problems.

M.Sc. Physics would provide the opportunity to the students:

- to understand the basic concepts of physics particularly concepts in classical mechanics, quantum mechanics, electrodynamics and electronics to appreciate how diverse phenomena observed in nature follow from a small set of fundamental laws.
- to pursue research related to Physics and Materials characterization.
- to carry out experiments in basic as well as certain advanced areas of physics.
- to appear for competitive examinations like, SET, GATE, NET, JEST, etc. to do research in national/international institutes and universities.
- to be able to teach at college as well as school level.

Course Outcomes

Class	Course name & Code	Outcomes
F.Y,B.Sc. Physics SEM I	Mechanics and Properties of Matter PHY-111	After completion of the course students are able to: ▪ understand the newton's laws and its applications ▪ understand the surface tension applications in daily life. ▪ understand the basic concepts of mechanics, fluid dynamics and various types of forces.

	Physics Principles and Applications PHY-112	After completion of the course students are able to: ▪ understand and imagine the internal structure of atom. ▪ understand the particle functions like electron, proton & neutron. ▪ understand the importance of electromagnetic radiation from sun to earth. ▪ understand the basic function of laser and its use in various fields.
	Physics Laboratory-IB PHY-123	After completion of the course students are able to: ▪ understand the use of various measuring Instruments like Vernier caliper, Micrometer Screw Gauge, Travelling Microscope . ▪ determine the young's modulus, modulus of rigidity of materials by different methods. ▪ use spectrometer and determination of angle of prism. ▪ understand the total internal reflection using LASER. ▪ understand how to determine wavelength of LASER light by plane diffraction grating. ▪ draw I-V characteristics of solar cell.
F.Y,B.Sc. Physics SEM II	Heat and Thermodynamics PHY-121	After completion of the course students are able to: ▪ understand the various thermodynamic processes like isothermal, isobaric, isochoric processes and laws of thermodynamics. ▪ understand Carnot's cycle, Heat engines and Refrigerators. ▪ understand the various types of thermometers like Liquid filled thermometers, Gas filled thermometers, Bimetallic thermometers, Platinum resistance thermometer
	Electricity and Magnetism PHY-122	After completion of the course students are able to: ▪ understand the concept of the electric force, electric field and electric potential for stationary charges. ▪ calculate electric potential and electric field by using Gauss's law. ▪ concept of magnetic field, magnetic

		field for steady currents using Biot-Savart's law and Ampere's law. ▪ study the magnetic materials and its properties.
	Physics Laboratory 1B PHY-123	After completion of the course students are able to: ▪ Interpret Isothermal and Adiabatic curve on P-V diagram. ▪ measure thermal conductivity by Lee's method. ▪ Determine calorific values of different fuels. ▪ use of Voltmeter, Ammeter and Multimeter. ▪ determine frequency of AC mains. ▪ understand LCR circuit and its use.
F.Y.B.Sc. Electronics SEM I	Basics of Applied Electronics EL- 111	After completion of the course students are able to: ▪ understand use of resistors, capacitors, inductors, relays, batteries, switches, cables and connectors, fuses. ▪ understand series and parallel combination of resistors, capacitors and inductors ▪ study input and output impedance of ac and dc voltage and/or current sources. ▪ understand smart phone system, security systems: surveillance camera system cctv, public address system. ▪ understand the application of kirchoff's voltage law and kirchoff's current law, thevenin, norton , superposition and maximum power transfer theorems
	Electronic Devices and Circuits EL- 112	After completion of the course students are able to: ▪ understand pn junction diode, zener diode and its IV characteristics. ▪ understand working of BJT, FET and MOSFET Basics and Applications. ▪ Light-Emitting Diodes Photo transistors LDR and its use in street light controller. ▪ Opto- Isolators (MCT2E) and its use in isolation.
	Electronics Lab IA EL- 113	After completion of the course students are able to: ▪ operate Signal Generators and CRO,DMM. ▪ verify Kirchhoff's Voltage and current

		laws ▪ verify Thevenin's Theorem , Norton's Theorem , Maximum Power Transfer Theorem ▪ understand working of GSM, GPS and Bluetooth. ▪ design Transistor as a switch.
F.Y.B.Sc. Electronics SEM II	Fundamentals of Digital Electronics EL-121	After completion of the course students are able to: ▪ understand number Systems: decimal, binary, hexadecimal, BCD, gray code and their inter-conversions. ▪ study Logic gates: AND, OR, NOT, EX-OR, NAND, NOR, EX-NOR, NAND and NOR gates. ▪ study the Flip Flops, S-R FF , J-K FF, T and D type FFs, Master-Slave FFs and Flip flop as memory device. ▪ study shift registers and their types. ▪ study asynchronous-Mod16, Mod-10, Mod-8, up down counter, synchronous-Ring counter, Event counter.
	Analog and Digital Device applications EL- 122	After completion of the course students are able to: ▪ understand the working of OPAMP and their applications. ▪ study schmitt trigger, function generator, audio amplifier, IC-555 astable, monostable and bistable operation. ▪ study D/A converter: R-2R Ladder network, Binary Weighted DAC. ▪ study the basic operation and block diagram: digital thermometer.
	Electronics Lab IB **EL- 123**	After completion of the course students are able to: ▪ verify Op-Amp as inverting and non-inverting, integrator and differentiator, adder &subtractor, voltage to current converter. ▪ study schmitt trigger using IC-555 timer. ▪ design smoke detector circuit. ▪ Verify IC-logic gates. ▪ study simulation experiment using pSpice.
S.Y.B.Sc. SEM III	Mathematical Methods in Physics PHY-231	After completion of the course students are able to: ▪ understand complex numbers, their forms and applications.

		▪ understand partial differentiation, ▪ successive differentiation and total differentiation. ▪ understand cartesian and polar co-ordinates. ▪ understand thd vector algebra and their analysis. ▪ study the degree, order, linearity and homogeneity of differential equation.
	Electronics PHY-232	After completion of the course students are able to: ▪ understand number Systems: decimal, binary, hexadecimal, BCD, gray code and their inter-conversions. ▪ study Logic gates: AND, OR, NOT, EX-OR, NAND, NOR, EX-NOR, NAND and NOR gates. ▪ verify Kirchhoff's Voltage and current laws ▪ verify Thevenin's Theorem , Norton's Theorem , Maximum Power Transfer Theorem ▪ understand working of BJT and UJT Basics and applications. ▪ understand the working of OPAMP and their applications.
	Practical Course (Lab 2A) PHY-233	After completion of the course students are able to: ▪ verify circuit theorems (Thevenin's, Norton's and Maximum Power Transfer Theorems). ▪ study I-V Characteristics of UJT/ UJT as Relaxation Oscillator. ▪ verify Op-Amp as inverting and non-inverting, adder & subtractor. ▪ study of logic gates and verification of de Morgan's theorems. ▪ plot various trigonometric functions using spread sheet microsoft excel, sinx, cosx, tanx,ex, e-x, logx, lnx, xn. ▪ plot various trigonometric functions using spread sheet microsoft excel circle, ellipse, parabola, hyperbola.
S.Y.B.Sc. **SEM IV**	Oscillations, Waves, and Sound PHY-241	After completion of the course students are able to: ▪ Undamped Free Oscillations, Damped Oscillations, Forced Oscillations. ▪ understand the wave motion and its interpretation. ▪ understand the sound and Doppler effect.

	Optics PHY-242	After completion of the course students are able to: ▪ understand the geometrical optics. ▪ understand the lens aberrations. ▪ use optical Instruments such as simple microscope, compound microscope, etc. ▪ understand the polarisation of light.
	Practical Course (Lab 2B) PHY-243	After completion of the course students are able to: ▪ determine the value of acceleration due to gravity ▪ by bar pendulum. ▪ measure coefficient of absorption of sound for different materials. ▪ understand the Lissajous figures and determination of unknown frequency. ▪ determine the wavelength of monochromatic light source by Newton's ring method. ▪ study the dispersive power of glass prism.
T.Y.B.Sc. Physics **SEM III**	Mathematical Methods in Physics -II PHY-351	After completion of this course students will be able to: ▪ Understand Cartesian, Spherical polar and Cylindrical co-ordinate systems. ▪ Understand the use of gradient, divergence, Laplacian andCurl. ▪ Understand the Special Theory of Relativity: Mass-energy relation. ▪ Understand the degree, order, linearity and homogeneity of differential equations. ▪ Understand the use of Legendre,Hermite Polynomials and Bessels functions.
	Electrodynamics PHY-352	After completion of this course students will be able to: ▪ Understand the applications of Coulomb's law, Gauss law, Electric field, Electrostatic Potential. ▪ Understand the concepts of magnetic induction, magnetic flux and magnetic field. ▪ Understand the applications of Biot-Savart's law, Ampere's force law ▪ Understand the day to day applications of Electrodynamics.
	Classical Mechanics PHY-353	After completion of this course students will be able to: ▪ Apply Newton's laws of motion to understand Projectile motion in various medium, Rocket ▪ motion, Motion of a charged particle in constant electric, magnetic and

		electromagnetic field. ▪ Understand the Kepler's laws of planetary motion and Orbits of artificial satellites. ▪ Understand the Elastic and inelastic scattering and relation between scattering angles in laboratory and centre of mass system. ▪ Understand the use of Langrangian and Hamiltonian formulation in particle motion. ▪ Understand the application of Canonical Transformation and Poisson's Bracket.
	Atomic and Molecular Physics PHY-354	After completion of this course students will be able to: ▪ Understand the Rutherford atomic model and Vector atom model. ▪ Understand the Pauli Exclusionprinciple and electron configuration. ▪ Understand the LS and JJ coupling schemes. ▪ Understand the normal and anomalous zeemaneffect and Stark effect. ▪ Understand the application of X ray spectroscopy. ▪ Understand the molecular spectroscopy and raman spectroscopy.
	Computational Physics PHY-355	After completion of this course students will be able to: ▪ Properties of algorithms,a for kinematic equations, free fall, equation of state, factorial of anumber. ▪ Develop the program using C Programming. ▪ Understand the use of Graphics in C programing. ▪ Understand the errors in computation. ▪ Write C program for trapezoidalrule andSimpson's 1/3rd rule.
	Elements of Materials Science PHY-356(B)	After completion of this course students will be able to: ▪ Understand the defects in solids. ▪ Understand the elastic deformation and plastic deformation. ▪ Understand the cross linked polymer vulcanization of rubber. ▪ Understand the Phase Diagram importance and objective. ▪ Understand the Properties and applications of smart materials.
	Energy studies PHY-3510(H)	After completion of this course students will be able to: ▪ understand the comparative aspects, advantages and disadvantages of various sources of energy ▪ Learn the basic principles involved and

		technologies developed in the uses of solar energy, biomass energy, wind energy, fuel cells ▪ Understand the challenges and opportunities in conversion of energy from one form to another, generation of electricity and mechanical work using different energy sources. ▪ Imagine about future road maps in the fields of energy conversion and storage technologies.
	Physics Workshop Skill PHY-3511(K)	After completion of this course students will be able to: ▪ Handle and test various instruments. ▪ Understand the various aspects of instruments and their usage through hands-on mode. ▪ Understand the construction of CRT, Electron gun, electrostatic focusing and acceleration. ▪ Measure the distortion of a RF signal generator using distortion factor meter.
	Physics Laboratory-3A PHY-357	After completion of this course students will be able to: ▪ Measure Young's modulus of materials by Newton's Ring and Koeing method. ▪ Determine the wavelength of light by Michelson's interferometer. ▪ Understand the Zeeman Effect ▪ Determine the forced oscillations by electromagnetically driven simple pendulum ▪ Determine Resolving Power of grating .
	Physics Laboratory-3B PHY-358	After completion of this course students will be able to: ▪ Measure the values of a capacitors using CRO ▪ understand the use of IC 7490 as mod 2, mod 5, mod 7 and mod 10 counter. ▪ Find pressure using Van-der-Waals' equation of state by C-Programing. ▪ Understand the use of Bisection and Newton Raphson method.
	Physics Project-I PHY-359	After completion of this course students will be able to: ▪ Finalize the Title of Project, Aim and objective, Significance, Literature survey, Materials required, Method and Application etc. ▪ Understand the Project Research methodology and data collection methods ▪ Project Problem Writing and Presentation Skills.
T.Y.B.Sc. Physics	Solid State Physics	After completion of this course students will

SEM VI	PHY-361	be able to: ▪ Understand Lattice, Basis, Translational vectors, Primitive unit cell, Symmetry operations, Different types oflattices and crystal structures. ▪ Understand X ray Diffraction and Other Characterization Techniques. ▪ Understand Free Electron and importance of Band Theory of Metals. ▪ Understand the magnetic properties of materials.
	Quantum Mechanics PHY-362	After completion of this course students will be able to: ▪ Understand the concept of wave packet, phase velocity, group velocity. ▪ Understand the Heisenberg's uncertainty principle with thought experiment. ▪ Understand the physical interpretation of wave function, Schrodinger time dependent and independent equations. ▪ Apply the Schrodinger Steady state equation to study the motion of particles. ▪ Understand the importance of Operators in Quantum Mechanics.
	Thermodynamics and Statistical Physics PHY-363	After completion of this course students will be able to: ▪ Understand the Kinetic theory of gases. ▪ Understand the Maxwell Relations and Application. ▪ Understand the Statistical Distribution of System of Particles. ▪ Understand the Canonical ensembles and micro canonical Ensembles. ▪ Understand the importance of Maxwell-Boltzmann's statistics, Bose-Einstein Statistics, Fermi-Dirac Statistics.
	Nuclear Physics PHY-364	After completion of this course students will be able to: ▪ Understand the Basic Properties of Nucleus. ▪ Understand the Properties of α, β,γ-rays. ▪ Understand the Properties of nuclear forces. ▪ Understand the use of Gas filled Detectors and Solid state detectors. ▪ Understand the concept regarding nuclear fission, chain reaction and critical mass and nuclear reactor.
	Electronics-II PHY-365	After completion of this course students will be able to: ▪ Understand the application of light emitting diode. ▪ Understand the working principle of different Transistor amplifiers. ▪ Draw the IV characteristics of

		JFET,MOSFET (DEMOSFET and E only MOSFET) ▪ Understand the application of Op-Amp in integrator, Differentiator, Comparator, Schmitt Trigger. ▪ Understand the working of Astable, monostable and bistablemultivibrator using IC555.
	Physics of Nanomaterials PHY-366(P)	After completion of this course students will be able to: ▪ Understand the history of nanomaterialsand challenges in nanotechnology. ▪ Understand the different methods of synthesis of nanomaterials and their importance. ▪ Understand the different characterization techniques use to study nanomaterials. ▪ Understand the Mechanical, Electrical, Thermal, Optical, solubility, melting point and Magnetic ▪ Properties of nanomaterials. ▪ Understand the application of nanomaterials in Medical, Biological, Automobiles, Space, Defense, Sports, Cosmetics and Cloth industry.
	Solar PV System: Installation, Repairing and Maintenance PHY-3610(V)	After completion of this course students will be able to: ▪ study basics of solar photovoltaic (PV) cells, modules, and system components. ▪ Design and sizing of off-grid PV system for homes, apartments as well as commercial offices. ▪ Understand energy conversion from sunlight to electricity, and working with solar conversion equipment.
	Microcontrollers PHY- 3611(Y)	After completion of this course students will be able to: ▪ Understand Intel 8051 Microcontroller: Block Diagram and Functions of each block, Pinout details. ▪ Understand 8051 Assembly programming, 8051 data types and assembler directives, ▪ Different Addressing modes ▪ Understand Data Transfer instructions, Arithmetic Instructions, Logic and compare instructions, rotate instructions, Branch (Jump, Call RET) instructions. ▪ Understand Basics of Serial Data Communication, Types of Serial Data Communication, Concept of Baud Rate, RS 232 Standards, 8051 connection to RS 232, Functions of SBUF and SCON Registers.
	Physics Laboratory-	After completion of this course students will

	4A PHY-367	be able to: ▪ Measure Coefficient of sound absorption. ▪ Measure the Hall coefficient by Hall effect. ▪ Study of XRD spectrum of any material. ▪ Measure thermal conductivity of rubber tube. ▪ Determine Planck's constant. ▪ Verify Stefan's fourth power law by bulb filament.
	Physics Laboratory-4B PHY-368	After completion of this course students will be able to: ▪ Design and built astable multivibrator using IC 555/IC 741. ▪ Understand the use of Ultrasonic interferometer to measure velocity of sound in liquids ▪ .Determine the diameter of a thin wire using a laser beam. ▪ Use of Temperature controller using PT 100 / thermocouple /thermistor temperature sensors. ▪ Measure transmission loss using expansion chamber muffler.
	Physics Project-II PHY-369	After completion of this course students will be able to: ▪ Prepare nanoparticles for various applications. ▪ Handle scientific instruments such as furnace, weighing balance, etc. ▪ Read and understand scientific research articles related to the project topic. ▪ Think critically over the chosen project. ▪ Write and present the project work in the national/international conferences. ▪ Write and publish project work in reputed ugc listed journals.
M.Sc. I **SEM II**	Electrodynamics PHCT-121	After completion of this course students will be able to: • understand the multipole expansions and time varying fields. • understand Energy, Force, Momentum Relations and Electromagnetic Wave Equations. • understand the Inhomogeneous wave equations, Lorentz's and Coulomb's gauges, Gauge transformations. • understand the Minkowski's space time diagram, Four vector potential, electromagnetic field tensor.
	Atoms and Molecules PHCT-122	After completion of this course students will be able to: • understand the coupling schemes, two

		electron spectra, fine structure and hyperfine structure of spectra. • understand the spectra of diatomic • molecules, vibration course structure, vibrational analysis of band system, Frank Condon principle. • understand the principle of Microwave Spectroscopy, Infrared spectroscopy and Raman spectroscopy. • understand the principles of ESR, ESR spectrometer, NMR.
	Quantum Mechanics PHCT-123	After completion of this course students will be able to: • understand the self adjoint operators, eigen • functions and eigen values, degeneracy, Dirac delta function, Completeness and closure property. • understand the Dirac's bra and ket notation, dynamical variables and linear operators, projection operators, unit operator, unitary operator, matrix representation of an operator • understand the computation of Clebsch-Gordon coefficients. • understand the time dependent and independent Perturbation theory, WKB approximation.
	Physics of Nanomaterials PHOT-124	After completion of this course students will be able to: • understand the effect of reduction of dimension and quantum size effect. • understand and know the different synthesis methods of the nanomaterials. • understand the mechanical, thermal, electrical, optical and magnetic Properties of nanomaterials. • study the properties of fullerine, graphine and carbon nonotubes.
	Physics Lab-II PHCP-125	After completion of this course students will be able to: • plot the current voltage characteristics of a CdS photoresistor at constant irradiance. • determine the speed of light using transit time of light pulse as a function of a reflecting mirror. • Measure the charge Q on a plate capacitor as a function of the applied

		voltage E • determine the capacitance C as a function of the distance d between the plates • determine the specific heat of copper, lead and glass at three different temperatures • determine charge concentration, conductivity of Ge-semiconductor
M.Sc. II **SEM III**	Statistical Mechanics PHCT-231	After completion of this course students will be able to: • understand the Probability theory, Statistical Description of thermodynamic system. • understand the classical statistical mechanics. • understand the applications of statistical mechanics and quantum distribution functions. • understand the boltzmann limit of boson and fermion gases. • understand the applications of Bose-Einstein statistics and Fermi-Dirac statistics.
	Solid State Physics PHCT-232	After completion of this course students will be able to: • understand the crystal structure and band theory of solids. • understand the classical theory of diamagnetism, langevin theory of paramagnetism. • understand the concepts regarding ferromagnetism and antiferromagnetism. • understand the superconductivity and dielectric properties of solids. • understand the Clausius– Mossotti relation, Piezoelectricity.
	Experimental Techniques in Physics - I PHCT-233	After completion of this course students will be able to: • understand the concepts regarding signal, signal analysis and sensors. • study the vacuum physics and its applications in different fields. • study the different vacuum techniques. • study the Vacuum gauges: Mc Leod, Thermocouple (Pirani), Penning gauges. Hot cathode ionization (triod type), Bayard-Alpart.
	Material Science - I	After completion of this course students

	PHOT-234	will be able to: understand the properties of materials and defects in solids. study the solid solutions its solubility and diffusion in solids. understand the theory of metallurgical thermodynamics. understand the topology of binary phase diagrams: eutectic, peritectic, monotectic, eutectoid, peritectoid, syntactic reaction, extension rule.
	Physics Laboratory - III PHCP-235	After completion of this course students will be able to: • find the inverse of an an matrix. • Interpolate the value of a function at a point by Lagrange interpolation method. • Evaluate a given function f(x) using trapezoidal/ Simpson rule correct up to given accuracy by successively halving the step size. • write a program and display the Miller planes in the cubic lattice. • write the differential equation for charging /discharging of a capacitor through a resistance. • write a program to graphically display eigen functions and probability density curves for • particle in one dimensional rigid box.
M.Sc. II **SEM IV**	Nuclear Physics PHCT-241	After completion of this course students will be able to: • understand general properties and concepts of nuclei. • understand the principle of radiation detectors and nuclear models. • understand reaction Dynamics, nuclear reactors and accelerators. • understand the principle of nuclear interactions and particle physics. • understand the elementary particles, Quarks and Higgs Boson concept.
	Experimental Techniques in Physics-II PHCT-242	After completion of this course students will be able to: understand the Different types of radiations (γ -rays, X-rays, UV-VIS, IR, microwaves) and their sources. study the Techniques used for XRD, Thermo-gravimetric (TGA), Differential Thermal Analysis (DTA).

		study the Morphological and Magnetic Characterization used to study the materials. understand the principles of Fourier Transform Infra-Red (FTIR), Ultraviolet-Visible (UV-VIS), Diffused Reflectance Spectroscopy (DRS), X-ray Absorption (XPS), Electron Spin Resonance(ESR), Nuclear Magnetic Resonance (NMR), Raman Spectroscopy.
	Physics of Thin Films PHOT-243	After completion of this course students will be able to: • study the growth of thin films its nucleation and condensation. • study the different deposition techniques such as Physical Vapour Deposition, Chemical Vapour Deposition, Molecular Beam Epitaxy, Sputtering, Spray pyrolysis, Dip coating and Spin coating. • study the electrical properties of thin films. • study the applications of thin films in solar cell, sensor, communication, etc.
	Material Science - II PHOT-243	After completion of this course students will be able to: • study the Ceramics phases ceramic crystals (AX) Ceramic crystals (AmXp), multiple compounds, silicates, mechanical behaviour of ceramics. • understand the processing of ceramic materials. • study the magnetic properties of materials. • studt the high transition temperature materials, Giant magneto-resistance (GMR) materials.
	Project PHCP-245	After completion of this course students will be able to: ▪ Prepare nanoparticles for various applications. ▪ Handle scientific instruments such as furnace, weighing balance, etc. ▪ Read and understand scientific research articles related to the project topic. ▪ Think critically over the chosen project. ▪ Write and present the project work in the national/international conferences.

		▪ Write and publish project work in reputed ugc listed journals.

Department of Mathematics

A report of Programme Outcome, Programme Specific Outcome & Course Outcome

Programme Outcome:

Savitribai Phule Pune University has decided to change the syllabi of various faculties from June, 2019. Taking into consideration the rapid changes in science and technology and new approaches in different areas of mathematics and related as a subjects board of studies in mathematics with concern of teachers of mathematics from different colleges affiliated to Savitribai Phule Pune University has prepared the syllabus of F.Y., S.Y., T.Y. B.Sc & B.Sc (Computer Science) Mathematics.

The students apply reasoning & understand the mathematical knowledge in industrial, social, environmental contest. They understand the importance of mathematics knowledge for critical thinking, ethics, social ,interactions & sustainability. The students understand the basic concepts of mathematics & statistics enhancing student's overall development & to equip them with mathematical modelling, abilities, problem solving skills for various kinds of employment. A student should get adequate exposure to global & local concerns then many aspects of mathematical sciences. A student be able to apply there skills and knowledge i.e. translate information presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion. A student should be made aware of history of mathematics and hence of its past, present & future role as part of our culture.

Programme Specific Outcome:

On successful completion of B.Sc Course (Mathematics), the students are able to:

- Explain the core ideas and the techniques of mathematics at the college level.
- Recognize the power of abstraction and generalization, and to carry out investigative mathematical work with independent judgment.
- Setup mathematical models of real world problems and obtain solutions in structured and analytical approaches with independent judgement.
- Carry out objective analysis and prediction of quantitative information with independent judgment.
- Communicate effectively about mathematics to both lay and expert audiences utilizing appropriate information and communication technology.
- Work independently, and to collaborate effectively in team work and team building.
- Conduct self-evaluation, and continuously enrich themselves through lifelong learning.

- Communicate to lay audiences and arouse their interest in the beauty and precision of mathematical arguments and science.
- Recognize the importance of compliance with the ethics of science and being a responsible citizen towards their community and a sustainable environment.
- Cultivate a mathematical attitude and nurture the interests

Course Outcome :-

Class	Subject	Outcome
F.Y.B.Sc Maths Sem-1 & Sem-2	Math-1 MT-111 Algebra	On successful completion of the course • Students are able to understand sets, relation and function. • Division & Euclidean Algorithm • Fermat's Theorem • Complex numbers
	MT-121 Analytical Geometry	• Analytical geometry of two & three dimensions • Lines in three dimensions • Sphere
	Math-2 MT-112 Calculus-1 & MT-122 Calculus-2	• Real numbers • Sequences • Series • Limit & Continuity • Differenciation • Ordinary differential equation • Exact differential equation
	Math-3 MT-113 & MT-123 Practical Course	On successful completion of the course students are able to understand the theory course problem using maxima software
S.Y.B.Sc Maths Sem-3 & Sem-4	Math-1 MT-231 Calculus of several variables	On successful completion of the course students are able to understand • Limit & continuity of several variables. • Partial derivatives & differentiability • Extreme values • Double & Triple Integral
	MT-241 Linear Algebra	• Matrices and system of linear equations • Vector spaces • Linear transformations • Linear isomorphism
	Math-2 MT-232(B) Graph Theory	• Graph • Path & circuit • Trees & fundamental circuit • Cut sets & cut vertices • Connectivity & severability
	MT-242(A) Vector calculus	• Vector valued functions • Integrals • Surface integrals

Class	Subject	Outcome
		• Applications of integrals
	Math-3 MT-233 & MT-243 Practical Course	On maxima software problems on theory courses will be solved by students
T.Y. B.Sc 2019 Pattern Sem-5 & Sem-6	MT 351:Metric Spaces	• Introduction to metric space • Completeness property • Continuous function • Compactness & connectedness
	MT-361 Complex Analysis	• Complex numbers • Analytic functions • Elementary functions • Integrals • Series • Residues and poles
	MT-352 Real Analysis-I	• Sets & function • Sequence of real no. & series of real no.
	MT-362 Real Analysis-II	• Riemann Integral • Improper Integral • Sequences and series of functions
	MT-353 Group Theory	• Groups • Subgroups • Permutations • Homomorphisms and factor groups
	MT-363 Ring Theory	• Rings & fields • Ideals & factor rings • factorization
	MT-354 Ordinary differential equation	• Linear differential equations with constant coefficients • Non-homogeneous differential equation • Power series solutions • System of first order equations
	MT-364 Partial differential equation	• Ordinary differential equations in more than two variables • First order partial differential equations
	MT-355(A) Operations Research	• Modelling with linear programming • The simplex method and Duality • Transportation Model • The assignment model
	MT-365(B) Calculus of Variation and Classical Mechanic	• Variational Problems with Fixed Boundaries • Variational Problems with Moving Boundaries • Sufficient Conditions of Extremum • Mechanics of a Particle and System of Particles
	MT-356(c) Laplace Transform	• The Laplace Transform • he Inverse Laplace Transform

Class	Subject	Outcome
	and Fourier Series	• Beta function, Evaluation of Integration • Applications to Differential Equations • Fourier series
	MT-366(B) Computational geometry	• Two dimensional transformations • Three dimensional transformations • Plane curves • Space curves beizer curves
	MT 357: Practical Course Lab-1 (on Metric Space and Real Analysis-I)	• Problem solving skills of students are enhanced. • Theoretical concepts are strengthened by solving maximum no. of problems Due to one to one interaction with the teacher doubts of the students get cleared if any
	MT 367: Practical Course Lab-1 (on Complex Analysis and Real Analysis-II)	• Problem solving skills of students are enhanced. • Theoretical concepts are strengthened by solving maximum no. of problems • Due to one to one interaction with the teacher doubts of the students get cleared if any
	MT 358: Practical Course Lab-II (on Group Theory and Ordinary Differential equations)	• Problem solving skills of students are enhanced. • Theoretical concepts are strengthened by solving maximum no. of problems • Due to one to one interaction with the teacher doubts of the students get cleared if any
	MT 368: Practical Course Lab-II (on Ring Theory and Partial Differential Equations)	• Problem solving skills of students are enhanced. • Theoretical concepts are strengthened by solving maximum no. of problems • Due to one to one interaction with the teacher doubts of the students get cleared if any
	MT 359: Practical Course Lab-III (on DSE-3A and DSE-3B)	• Problem solving skills of students are enhanced. • Theoretical concepts are strengthened by solving maximum no. of problems • Due to one to one interaction with the teacher doubts of the students get cleared if any
	MT 369: Practical Course Lab-III (on DSE-6A and DSE-6B)	• Problem solving skills of students are enhanced. • Theoretical concepts are strengthened by solving maximum no. of problems • Due to one to one interaction with the teacher doubts of the students get cleared if any
	MT -3510: Programming in Python -I	• Implement object oriented concepts • Installation of Python • Boolean operator • String, list, tuple • Iterations and Conditional statements

Class	Subject	Outcome
		• Numerical methods in Python • 2D and 3D Graphs
	MT 3610: Programming in Python-II	• Demonstrate the use of Python in Mathematics such as operations research and computational Geometry etc. • Study graphics and design and implement a program to solve a real world problem. • The students will implement the concepts of data with python and database connectivity.
	MT-3511: LaTeX for Scientific Writing	• Write a simple LaTeX input document based on the article class. • Turn the input document into pdf with the pdflatex program. • Format Words, Lines, and Paragraphs. • Understand how to present data using tables.
	MT 3611: Mathematics into LaTeX	• typeset mathematical formulas, use nested list, tabular and array environments. • import figures and pictures that are stored in external files • User-Defined Macros

Department of Microbiology

Programme Specific Outcome (PSOs) and Course Outcomes (COs) (2020-21)

Programme Specific Outcome of B. Sc Microbiology

A candidate who has completed B. Sc in Microbiology will acquire

- knowledge of different sectors of Microbiology.
- Microbiological skills and apply them in industry.
- skills necessary for microbiological research.
- ability to solve various societal problems related to microbiology.

F.Y.B.Sc Microbiology Course Outcomes

Class	Subject code	Paper	Title	Cos: After successful completion of this course, student will be able to
F.Y.B.Sc. Sem I	**MB 111**	**I**	**Introduction to Microbial World**	describe development of Microbiology as discipline.
				summarise contribution of different scientist in Microbiology.
				write recent developments in life sciences.
				differentiate between different types of organisms.
				explain beneficial microorganism used in different fields.
				describe harm caused by microorganism.
	MB 112	**II**	**Basic Techniques in Microbiology**	describe different types of microscopy.
				sketch ray diagramme of microscopes.
				illustrate principles and methods of different staining techniques.
				differentiate between sterilization and disinfection.
				compare effect of moist and dry heat on microorganisms.
				state mode of action of different disinfectants.
	MB113	**III**	**Practical Course based on theory**	apply safety measures and good laboratory practices.

Class	Subject code	Paper	Title	Cos: After successful completion of this course, student will be able to
			paper I and II	identify different microorganisms on the basis of morphology.
				handle different instruments and glasswares.
				describe morphology of bacteria by using different staining technique.
				demonstrate the motility of bacteria.
				check the effeciency of chemical disinfectant.
F.Y.B.Sc. Sem II	**MB121**	**I**	**Bacterial Cell and Biochemistry**	explain bacterial cell cytology.
				describe ultrastructure of different parts of bacterial cell.
				illustrate functions of different parts of bacterial cell.
				classify different biomolecules present in cell.
				sketch chemical structures of biomolecule
				describe functions of different biomolecule
	MB122	**II**	**Microbial cultivation and growth**	classify bacteria based on nutritional requirment.
				explain design and preparation of media.
				write cultivation of extreamophyles
				draw bacteral growth curve.
				compute number of microorganisms.
				illustrate factors affecting bacterial growth.
	MB123	**III**	**Practical Course based on theory paper I and II**	prepare laboratory media.
				check sterilization efficincy of autoclave.
				demonstrate different parts of microorganism by staining.
				isolate bacteria.
				enumerate bacteria.
				analyse effect of different

Class	Subject code	Paper	Title	Cos: After successful completion of this course, student will be able to
				environmental factor on bacteria.

S.Y.B.Sc Microbiology Course Outcomes

Class	Subject code	Paper	Title	Cos: After successful completion of this course,student will be able to
S.Y.B.Sc Sem I.	**MB: 231**	**I**	**Medical Microbiology & Immunology**	define various terminologies in medical microbiology.
				Describe common pathogenis organisms
				Illustrate different concept related to chemotheropy.
				dlassify different types of immunity.
				describe concept of antigen and antobodies
				explain immunohematolgy.
S.Y.B.Sc.	**MB: 232**	**II**	**Bacterial Physiology and Fermentation Technology**	classify enzymes.
				explain models for enzyme catalysis.
				draw metabolic pathways with structure.
				plan isolation of industrially important strains.
				sketch and describe different types of fermenters.
				select media suitable for fermentation.
	MB: 233	**III**	**Practical Course based on MB:231, MB:232,**	measure diamentio of microorganism.
				Identify blood group.
				interprite biochemical characteristic.
				detect different enzyme production.
				identify pathogenic organism from clinical sample.
				Screen industrially important oranisms.
S .Y.B.Sc Sem II	**MB: 241**	**I**	**Bacterial Genetics**	describe experimental evidencs for Nucleic acid as genetic material.
				differentiate between types of nucleic

Class	Subject code	Paper	Title	Cos: After successful completion of this course,student will be able to
				acid.
				Explain prokaryotic DNA replication process.
				illustrate concept of gene expression.
				summarise different types of mutations and reversions.
				describe plasmid.
	MB: 242	**II**	**Air and Water Microbiology**	describe air mcrobiology.
				explain water microbiology.
				plan bacteriological analysis of water for potability.
				describe role of icroorganism in soil.
				plan the production of biofertilizer.
				design process of production of biocontrol agent.
	MB: 243	**III**	**Practical Course based on MB:241, MB:242**	calculate air flora.
				compute microbial diversity of air.
				analyse potability of water.
				prepare bioinoculant.
				isolate mutant.
				predict treatment required for mutant isolation.

T.Y.B.Sc Microbiology Sem I- Course outcomes

Class	Subject code	Paper	Title	Cos: After successful completion of this course, student will be able to
T.Y.B.Sc Sem-V	**MB:351**	**I**	**Medical Microbiology - I**	illustrate human body systems and pathogens.
				describe epidemiology of infectious disease.
				design case control and cohort study.
				classify pathogenic organism using biochemical tests.
				describe pathogenesis and symptoms of different disease.
				explain laboratory diagnosis, prophylaxis and chemotherapy.
T.Y.B.Sc Sem-V	**MB:352**	**II**	**Immunology -I**	classify organs of immune system.
				describe second line of defense.

				illustrate antigen antibody. identify different antigen antibody interaction. outline structure and function of MHC complex. write monoclonal antibody preparation.
T.Y.B.Sc Sem-V	**MB:353**	**III**	**Enzymology**	predict role of vitamins in metabolism. quantitative enzymes. design enzyme purification process derive and plot equations of enzyme kinetics. explain metabolic regulation. illustrate immobilization of enzyme.
T.Y.B.Sc Sem-V	**MB:354**	**IV**	**Genetics**	Draw process of DNA replication. explain transcription process. correlate prokaryote and eukaryote transcription. explain translation in prokaryotes and eukaryotes. illustrate gene transfer by transformation, conjugation and transduction. map the genes.
T.Y.B.Sc Sem-V	**MB:355**	**V**	**Fermentation Technology -I**	design process of strain improvement. optimize media of fermentation. design media sterilization process. draw flow sheet of scale up. select downstream processing method for fermentation product. assure the quality of fermentation product.
T.Y.B.Sc Sem-V	**MB:356**	**VI**	**Agricultural Microbiology**	explain stages in development of plant disease. classify plant diseases based on symptoms. describe methods of plant disease control. correlate role of organism in sustainable agriculture. illustrate role of role of plant biofilm. determine role of microorganisms in plant genetic engineering.
T.Y.B.Sc Sem-V	**MB 357**	**Practical course – I**	**Practical course based on MB351 &MB352**	examine clinical samples. isolate pathogen from clinical sample. diagnose disease by agglutination test prepare epidemiological survey report. estimate hemoglobin concentration. calculate blood cells and hematological indices.

T.Y.B.Sc Sem-V	**MB 358**	**Practical course – II**	**Practical course based on MB353 &MB354**	determine molar extinction coefficient and absorption spectra. detect presence of protein and carbohydrate. prepare buffer. separation of compound by paper chromatography. estimate amount of carbohydrate or protein. check the purity and concentration of DNA.
T.Y.B.Sc Sem-V	**MB 359**	**Practical course – III**	**Practical course based on MB355 &MB356**	test the sterility of pharmaceutical. calculate minimum inhibitory concentration. assay antibiotic and vitamin. isolate plant pathogen. identify pathogen based on symptoms. prepare bioinoculant.
T.Y.B.Sc Sem-V	**MB3510**		**Marine Microbiology**	define different marine habitats. correlate role of marine organisms in nutrient cycling. illustrate water sampling and culturing methods. describe role of microbes in bioremediation and bio perspectives. isolate marine organism. isolate extremophile.
T.Y.B.Sc Sem-V	**MB3511**		**Dairy Microbiology**	define different types of milk and sources of contamination. describe milk preservation techniques. illustrate spoilage of milk. assure the quality of milk and milk product. analyze milk by microbiological examination. check quality of dairy product.

T.Y.B.Sc Microbiology Sem -VI- Course outcomes

Class	**Subject code**	**Paper**	**Title**	Cos: After successful completion of this course, student will be able to
T.Y.B.Sc Sem-VI	**MB:361**	**I**	**Medical Microbiology-II**	list different routes of drug administration. explain mode of action of different antimicrobial agents. predict mechanism of drug resistance. describe viral human pathogens.

				explain human protozoal parasites. describe fungal pathogens.
T.Y.B.Sc Sem-VI	**MB:362**	**II**	**Immunology II**	define properties and functions of cytokines. express humoral immune response. describe cell mediated immune response. classify hypersensitivity. illustrate autoimmunity and autoimmune diseases. explain immunodeficiency.
T.Y.B.Sc Sem-VI	**MB:363**	**III**	**Metabolism**	illustrate membrane transport mechanism. define terms in bioenergetics. draw electron transport chain. sketch biosynthesis pathways of macromolecules. draw degradation pathways of macromolecules. explain bacterial photosynthesis.
T.Y.B.Sc Sem-VI	**MB:364**	**IV**	**Molecular Biology**	map genome in eukaryotes. explain genetics in Bacteriophages. illustrate DNA damage and repair mechanism. describe different tools of recombinant DNA technology. draw and describe process of recombinant DNA technology. explain molecular techniques used in RDT.
T.Y.B.Sc Sem-VI	**MB:365**	**V**	**Fermentation Technology -II**	differentiate solid state and submerged fermentation. describe large scale production of primary metabolite. illustrate production of secondary metabolite. design large scale production of enzymes. describe production of biomass based product. design production of vaccines and immune sera.
T.Y.B.Sc Sem-VI	**MB:366**	**VI**	**Food Microbiology**	classify food. identify factors affecting microbial growth in food. describe food spoilage by microorganism. apply principles of food preservation. describe food poisoning and food infection. define prebiotic, probiotic and fermented food.
T.Y.B.Sc Sem-VI	**MB 367**	**Practical course – I**	**Practical course based on MB361 &MB362**	describe microbial pathogens from microscopic observation. isolate fungal pathogen. find out antibiotic sensitivity of bacterial pathogen. predict compatibility of blood groups of donor and recipient.

				quantitative antibodies for disease diagnosis. describe antigen antibody detection by ELISA or by diffusion assay.
T.Y.B.Sc Sem-VI	**MB 368**	**Practical course – II**	**Practical course based on MB363 &MB364**	estimate blood sugar , urea, cholesterol and protein. produce and purify enzyme. immobilize enzyme. calculate phage titer. isolate plasmid DNA. draw meiotic cell division.
T.Y.B.Sc Sem-VI	**MB 369**	**Practical course – III**	**Practical course based on MB365 &MB366**	prepare fermentation product on laboratory scale. produce fermentation product by solid state fermentation. identify probiotic microorganism. prepare SOPs for pharmaceutical industry. determine TDP,TDT,TDR and D value. detect aflatoxin.
T.Y.B.Sc Sem-VI	**MB 3610**		**Waste Management**	describe principles of waste water treatment. correlate role in waste water treatment. draw and describe operation of waste treatment plant. classify different types of waste determine solid content in waste water. determine DO, BOD, COD in waste water.
T.Y.B.Sc Sem-VI	**MB 3611**		**Nano-biotechnology**	define different terms in nano-biotechnology. explain synthesis process of metallic nanoparticle. characterize nano material by different techniques. describe application of nano particle. synthesize nanoparticle using microbe. characterize nanoparticle.

Programme Specific Outcomes for B.Sc. (Computer Science)

Department of Computer Science (B.C.S.)

Programme Outcomes for B.Sc.

PO1	An ability to apply knowledge of computing and mathematics appropriate to the discipline.
PO2	An ability to identify, formulates, and develops solutions to computational challenges.
PO3	An ability to design, implements, and evaluate a computational system to meet desired needs within realistic constraints.
PO4	An ability to function effectively on teams to accomplish shared computing design, evaluation, or implementation goals.
PO5	An understanding of professional, ethical, legal, security, and social issues and responsibilities for the computing profession.

Programme Specific Outcomes for B.Sc. (Computer Science)

PSO1	Apply fundamental principles and methods of Computer Science to a widerange of applications.
PSO2.	Design, correctly implement and document solutions to significant computational problems.
PSO3	Impart an understanding of the basics of our discipline.
PSO4.	Prepare for continued professional development.
PSO5.	Develop proficiency in the practice of computing.

Course Outcome for B.Sc. (Computer Science)Programming in C

CO1	Explain about the basic concepts of program development statements and its syntax.
CO2.	Explain the various types of arrays and its structure.
CO3	Discuss about the various types of Functions and String handling mechanisms.
CO4.	Explain the Concepts of structures and Unions.
CO5.	Illustrates the various operations performed on different types of files.

Object Oriented Programming with C++

CO1	Explain the top-down and bottom-up programming approach and apply bottom up approach to solve real world problems.
CO2.	Explain the difference between static and dynamic binding. Apply both techniques to solve problems.

CO3	Describe the concept of inheritance and apply real world problems.
CO4.	Discuss the generic data type for the data type independent programming which relate it to reusability.
CO5.	Explain to design of handling large data set using File I/O.

JAVA PROGRAMMING

CO1	Explain about basic Java language syntax and semantics to write Java programs.
CO2.	Describe the concepts of variables, conditional and iterative execution methods etc.
CO3	Discuss the the fundamentals of object-oriented programming in Java, including defining classes, objects, invoking methods
CO4.	Explain the various methodologies to handle the exception mechanisms and the principles of inheritance, packages and interfaces
CO5.	Demonstrate the programming concepts for applet and graphics.

OPERATING SYSTEM

CO1	Describe the basic components of an operating system and their role in implementations for general purpose, real-time and embedded applications.
CO2.	Define the concepts of processes, threads, asynchronous signals and competitive system resource allocation.
CO3	Explain what multi-tasking is and outline standard scheduling algorithms forMulti-tasking.
CO4.	Discuss mutual exclusion principles and their use in concurrent programming including semaphore construction and resource allocation.
CO5.	Expose the details of major operating system concepts, overview of system memory management and the implementation of file systems.

Database Management System

CO1.	Describe the fundamentals of File processing and database processing system.
CO2.	Explain the various data model and its application.
CO3	Explain the various normal forms and its role in DBMS.
CO4.	Explain the fundamental concepts of SQL programs.
CO5.	Describe the concepts of function, procedure, package, trigger and exception handling.

COMPUTER NETWORK

CO1.	Explain the local, metropolitan and wide area networks using the Standard OSI reference model.
CO2.	Discussion of various networking technologies.
CO3	Explain the concepts of protocols, network interfaces and design of performance issues in local area networks and wide area networks.
CO4.	Describe about wireless networking concepts, contemporary issues in networking technologies, network tools and network programming.
CO5.	Explain the analysis of different types of protocol and the comparison of number of data link, network and transport layer protocols.

SOFTWARE ENGINEERING

CO1	Explain the fundamental knowledge in science, mathematics, fundamentals ofcomputer science, software engineering and multidisciplinary engineering to begin in practice as a software engineer.
CO2.	Explain to design a system, component, or process to meet desired needs withinrealistic constraints such as economic, environmental, social, political, manufacturability, sustainability, ethical, health and safety.
CO3	Describe the techniques, skills, and modern engineering tools necessary for engineering practice.
CO4.	Explain the early careers will be capable of team and organizational leadership in omputing project settings, and have a broad understanding of ethical application of computing-based solutions to societal and organizational problems.
CO5.	Discuss about analyze, design and manage the development of a computing-based system, component or process to meet desired needs within realistic constraints in one or more application domains.

Internet Programming

CO1	Write PHP scripts to handle HTML forms.
CO2.	Write regular expressions including modifiers, operators, and met characters.
CO3	Create PHP programs that use various PHP library functions, and that manipulate files and directories.
CO4.	Analyze and solve various database tasks using the PHP language.
CO5.	Analyze and solve common Web application tasks by writing PHP programs.

Programming in C LAB

CO1	Explanation of design and algorithmic solution for a given problem.
CO2.	Construction of flowchart for the computer programs.
CO3	Explains the program using Control Statements
CO4.	Explains the program using Arrays and Functions.
CO5.	Explain the program using file handling with structure.

JAVA PROGRAMMING LAB

CO1	Explain the programming language design, syntax and semantics.
CO2.	Describe the critical thinking skills through solving programming problems.
CO3	Explain the standard syntax for java programs and other programming Tools.
CO4.	Describe the animation and events based advanced java program concepts (Applet)
CO5.	Explain the java programs using object oriented class with parameters, constructors, utility, calculations, methods including inheritance, test classesand exception handling.

Course Outcome for B.Sc. (Computer Science)

F. Y. B. Sc. Paper I CS- 111 & CS-121 Problem Solving using Computer and 'C' Programming

CO1	Explain about the basic concepts of program development statements and its syntax.
CO2.	Explain the various types of arrays and its structure.
CO3	Discuss about the various types of Functions and String handling mechanisms.
CO4.	Explain the Concepts of structures and Unions.
CO5.	Illustrates the various operations performed on different types of files.

F. Y. B. Sc. Paper II CS- 112 & CS-122 Database Management System

CO1	Describe the fundamentals of File processing and database processing system.
CO2.	Explain the various data model and its application.
CO3	Explain the various normal forms and its role in DBMS.
CO4.	Explain the fundamental concepts of SQL programs.
CO5.	Describe the concepts of function, procedure, package, trigger and exception handling.

F. Y. B. Sc. Paper III CS- 113 & CS-123 Practical Course Based on Programming in C

CO1	Explanation of design and algorithmic solution for a given problem.
CO2.	Construction of flowchart for the computer programs.
CO3	Explains the program using Control Statements
CO4.	Explains the program using Arrays and Functions.
CO5.	Explain the program using file handling with structure.

S. Y. B. Sc. Paper I CS- 231 & CS-241 Data Structures and Algorithms – I & II

CO1	To use well-organized data structures in solving various problems.
CO2.	To differentiate the usage of various structures in problem solution.
CO3	Implementing algorithms to solve problems using appropriate data structures.

S. Y. B. Sc. Paper II CS- 232 SOFTWARE ENGINEERING

CO1	Explain the fundamental knowledge in science, mathematics, fundamentals of computer science, software engineering and multidisciplinary engineering to begin in practice as a software engineer.
CO2.	Explain to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, manufacturability, sustainability, ethical, health and safety.
CO3	Describe the techniques, skills, and modern engineering tools necessary for engineering practice.
CO4.	Explain the early careers will be capable of team and organizational leadership in computing project settings, and have a broad understanding of ethical application of computing-based solutions to societal and organizational problems.

CO5.	Discuss about analyze, design and manage the development of a computing-based system, component or process to meet desired needs within realistic constraints in one or more application domains.

S. Y. B. Sc. Paper II CS- 242 COMPUTER NETWORK

CO1	Explain the local, metropolitan and wide area networks using the Standard OSI reference model.
CO2.	Discussion of various networking technologies.
CO3	Explain the concepts of protocols, network interfaces and design of performance issues in local area networks and wide area networks.
CO4.	Describe about wireless networking concepts, contemporary issues in networking technologies, network tools and network programming.
CO5.	Explain the analysis of different types of protocol and the comparison of number of data link, network and transport layer protocols.

S. Y. B. Sc. Paper III CS - 233 & CS - 243 Practical Course Based on Data Structures and Algorithms

CO1	Implementation of different data structures efficiently
CO2.	Usage of well-organized data structures to handle large amount of data
CO3	Usage of appropriate data structures for problem solving

T. Y. B. Sc. Paper I CS - 351 Operating Systems I
& CS - 361 Operating Systems II

CS – 351: On successful completion of the course students will be able to:	
CO1	Processes and Thread Scheduling by operating system.
CO2.	Synchronization in process and threads by operating system.
CO3	Memory management by operating system using with the help of various schemes.

CS – 361: On successful completion of the course students will be able to:	
CO4.	Management of deadlocks and File System by operating system
CO5.	Scheduling storage or disk for processes
CO6.	Distributed Operating System and its architecture and the extended features in mobile OS.

T. Y. B. Sc. Paper II CS - 352 Computer Networks – II
& CS - 362 Software Testing

CS – 352: On successful completion of the course students will be able to:	
CO1	Student will understand the different protocols of Application layer.
CO2.	Develop understanding of technical aspect of Multimedia Systems
CO3	Develop various Multimedia Systems applicable in real time.
CO4.	Identify information security goals.

CO5.	Understand, compare and apply cryptographic techniques for data security.

CS – 362: On successful completion of the course students will be able to:	
CO1	To understand various software testing methods and strategies.
CO2.	To understand a variety of software metrics, and identify defects and managing those defects for improvement in quality for given software.
CO3	To design test cases and test plans, review reports of testing for qualitative software.
CO4.	To understand latest testing methods used in the software industries.

T. Y. B. Sc. Paper III CS - 353 Web Technologies – I
& CS - 363 Web Technologies – II

CS – 353: On successful completion of the course students will be able to:	
CO1.	Understand how to develop dynamic and interactive Web Page

CS – 363: On successful completion of the course students will be able to:	
CO1.	Build dynamic website.
CO2.	Using MVC based framework easy to design and handling the errors in dynamic website.

T. Y. B. Sc. Paper IV CS - 354 Foundations of Data Science
& CS - 364 Data Analytics

CS – 354: On successful completion of the course students will be able to:	
CO1	Perform Exploratory Data Analysis
CO2.	Obtain, clean/process, and transform data.
CO3	Detect and diagnose common data issues, such as missing values, special values, outliers, inconsistencies, and localization.
CO4.	Demonstrate proficiency with statistical analysis of data.
CO5.	Present results using data visualization techniques.
CO6.	Prepare data for use with a variety of statistical methods and models and recognize how the quality of the data and the means of data collection may affect conclusions.

CS – 364: On successful completion of the course students will be able to:	
CO1	Use appropriate models of analysis, assess the quality of input, and derive insight from results.
CO2.	Analyze data, choose relevant models and algorithms for respective applications
CO3.	Understand different data mining techniques like classification, prediction, clustering and association rule mining
CO4.	Apply modelling and data analysis techniques to the solution of real world business problems

T. Y. B. Sc. Paper V CS - 355 Object Oriented Programming using Java - I
& CS - 365 Object Oriented Programming using Java - II

CS – 355: On successful completion of the course students will be able to:

CO1	Understand the concept of classes, object, packages and Collections.
CO2.	To develop GUI based application.

CS – 365: On successful completion of the course students will be able to:	
CO1	To access open database through Java programs using Java Data Base Connectivity (JDBC) and develop the application.
CO2.	Understand and Create dynamic web pages, using Servlets and JSP.
CO3.	Work with basics of framework to develop secure web applications.

T. Y. B. Sc. Paper VI CS - 356 Theoretical Computer Science
& CS - 366 Compiler Construction

CS – 356: On successful completion of the course students will be able to:	
CO1	Understand the use of automata during language design.
CO2.	Relate various automata and Languages.

CS – 366: On successful completion of the course students will be able to:	
CO1.	Understand the process of scanning and parsing of source code.
CO2.	Learn the conversion code written in source language to machine language.
CO3.	Understand tools like LEX and YACC.

T. Y. B. Sc. Paper VII CS - 357 Practical course based on CS 351
& CS - 367 Practical course based on CS 361

CS – 357: On successful completion of the course students will be able to:	
CO1	Process synchronization
CO2.	Processes and Thread Scheduling by operating system
CO3	Memory management by operating system using with the help of various schemes.

CS – 367: On successful completion of the course students will be able to:	
CO1.	Management of deadlocks by operating system
CO2.	File System management
CO3.	Disk space management and scheduling for processes

T. Y. B. Sc. Paper VIII CS - 358 Practical course based on CS 353 and CS 354
& CS - 368 Practical course based on CS 363 and CS 364

CS – 358: On successful completion of the course students will be able to:	
CO1.	Understand how to develop dynamic and interactive Web Page
CO2.	Prepare data for use with a variety of statistical methods and recognize how the quality of the data may affect conclusions.
CO3.	Perform exploratory data analysis

CS – 368: On successful completion of the course students will be able to:

CO1.	Build dynamic website.
CO2.	Using MVC based framework easy to design and handling the errors in dynamic website.

T. Y. B. Sc. Paper IX CS - 359 Practical Course based on CS 355
& CS - 369 Practical Course based on CS 365

CS – 359: On successful completion of the course students will be able to:	
CO1.	Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs.
CO2.	Read and make elementary modifications to Java programs that solve real-world problems.
CO3.	Validate input in a Java program.

CS – 369: On successful completion of the course students will be able to:	
CO1.	To Learn database Programming using Java
CO2.	Understand and Create dynamic web pages using Servlets and JSP.
CO3.	Work with basics of framework to develop secure web applications

T. Y. B. Sc. Paper X CS - 3510 Python Programming
& CS - 3610 Software Testing Tools

CS – 3510: On successful completion of the course students will be able to:	
CO1.	Develop logic for problem solving
CO2.	Determine the methods to create and develop Python programs by utilizing the data
CO3.	structures like lists, dictionaries, tuples and sets
CO4.	To be familiar about the basic constructs of programming such as data, operations, conditions, loops, functions etc
CO5.	To write python programs and develop a small application project

CS – 3610: On successful completion of the course students will be able to:	
CO1.	To understand various software testing methods and strategies.
CO2.	To understand a variety of software metrics and identify defects and managing those defects for improvement in quality for given software.
CO3.	To design test cases and test plans, review reports of testing for qualitative software.
CO4.	To understand latest testing tools used in the software industries.

T. Y. B. Sc. Paper XI CS - 3511 Block chain Technology
& CS - 3611 Project

CS – 3511: On successful completion of the course students will be able to:	
CO1	Learn the fundamentals of Blockchain Technology.
CO2.	Learn Blockchain programming
CO3	Basic knowledge of Smart Contracts and how they function.

Course Outcome for M.Sc. (Computer Science)

Sem – I

CSUT 111 Paradigm of Programming Language

CO1	To Understand the basic language implementation techniques
CO2.	Develop ability to learn new languages more quickly
CO3	To understand the concept of functional programming language
CO4.	Develop ability to learn and write small programs in different programming Languages

CSUT 112 Design and Analysis of Algorithm

CO1	To design efficient algorithms using various algorithm designing strategies
CO2.	To analyze the problem and develop the algorithms related to these problems
CO3	To classify the problem and apply the appropriate design strategy to develop algorithm
CO4.	To design algorithm in context of space and time complexity and apply asymptotic notation

CSUT 113 Database Technologies

CO1	To study types of NoSQL databases (Document oriented, keyValue pairs, Column-oriented and Graph)
CO2.	To understand detailed architecture, define objects, load data, query data and performance tune NoSQL databases.
CO3	Able to handle large volumes of structured, semi-structured, and unstructured data using database technologies.

CSDT 114 Cloud computing

CO1	To understand the principles and paradigm of Cloud Computing
CO2.	Ability to design and deploy Cloud Infrastructure
CO3	Understand cloud security issues and solutions
CO4.	Ability to understand role of Virtualization Technologies
CO5.	Design & develop backup strategies for cloud data based on features

CSUP 115 PPL and Database Technologies Practical

CO1	Apply the knowledge of Scala to develop web-based applications.
CO2.	Provides knowledge of code optimization
CO3	To understand concept of interoperability.
CO4.	Students are able to build and maintain the databases handling in real life applications and daily needs.

CO5.	Able to perform hands-on NoSql database lab assignments that will allow students to use the four NoSQL database types via products such as Cassendra, MongoDB,Neo4J and Riak

Sem – II

CSUT 121 Advanced Operating System

CO1	To design and understand the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems.
CO2.	To evaluate, and compare OS components through instrumentation for performance analysis.
CO3	To analyze the various device and resource management techniques for timesharing and distributed systems
CO4.	To develop and analyze simple concurrent programs using transactional memory and message passing, and to understand the trade-offs and implementation decisions.

CSUT 122 Mobile Technologies

CO1	To gain knowledge of installing Android Studio and Cross Platform Integrated Development Environment.
CO2.	An ability to use the techniques, skills, and modern technology.
CO3	To develop the different applications that mobile computing offers to people, employees, and businesses
CO4.	To develop high levels of technical competence in the field of mobile technology.

CSUT 123 Software Project Management

CO1	To identify the impact of IT projects on the performance of the organizations
CO2.	To understand, manage and develop IT infrastructure in different projects
CO3	To develop strategies to calculate risk factors involved in IT projects
CO4.	To use project management software to control the design, implementation, closure, and evaluation of IT projects
CO5.	To estimate, plan, calculate, and adjust project variables.

CSUT 124 Project

CO1	To demonstrate a depth of knowledge of modern technology.
CO2.	To complete an independent research project, resulting in at least a thesis publication, and research outputs in terms of publications in high impact factor journals, conference proceedings, and patents.
CO3	Students will acquire the skills to communicate effectively and to present ideas clearly and coherently to specific audience in both the written and oral forms.
CO4.	Students will be able to learn on their own, reflect on their learning and take appropriate actions to improve it.

CSUT 125 Practical on Advanced OS & Mobile Technologies

CO1	Student can understand internal structure and operations of OS along with various processes including threading, inter process communication and synchronization with I/O operations.
CO2.	Awareness of computational issues, resources in distributed environment.
CO3	To develop mobile computing applications by analyzing their characteristics and requirements, selecting the appropriate computing models and software architectures, and applying standard programming languages and tools.
CO4.	To understand how the underlying wireless and mobile communication networks work, their technical features, and what kinds of applications they can support.

Sem – III

CSUT 231 Software Metrics & Project Management

CO1	Get good knowledge of the issues and challenges faced while doing the Software project Management.
CO2.	To understand why majority of the software projects fails and how that failure probability can be reduced effectively.
CO3	To do the Project Scheduling, tracking, Risk analysis, Quality management and Project Cost estimation using different techniques.
CO4.	Students will learn a good communication skill, improve presentation and team forming ability

CSUT 232 Machine Learning

CO1	Explain Machine Learning concepts, classifications of Machine Learning and write simple programs using python.
CO2.	Describe Supervised Learning concepts.
CO3	Explain Support Vector Machine concepts.
CO4.	Describe unsupervised learning concepts and dimensionality reduction techniques.
CO5.	Discuss simple Machine Learning applications in a range of real-world applications using Python programming

CSUT 233 Web Frameworks

CO1	Get the introduction of modern web technologies.
CO2.	Learn and use server side programming using Node.js
CO3	Understand the asynchronous programming.
CO4.	Learn and understand web application in Django a Python Web Framework.

CSUT 235 Practical Course based on CSUT 231, CSUT 232 and CSUT 233

CO1	Students can write java programs using Design Pattern and Frameworks to create reusable and
CO2.	Learn about flexible software systems.
CO3	Understands about the process of deploying web apps using specific Frameworks.

CO4.	Students can write python programs using machine learning algorithms for solving practical

Sem – IV
CSUT241 Industrial Training

CO1	On successful completion of the course students will be able to:
CO2.	Capability to acquire and apply fundamental principles of engineering.
CO3	Become master in specialized technology
CO4.	Become updated with all the latest changes in technological world.
CO5.	Ability to communicate efficiently.
CO6.	Ability to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurship skills.
CO7.	Ability to identify, formulate and model problems and find engineering solution based on a systems approach.
CO8.	Capability and enthusiasm for self-improvement through continuous professional development and life-long learning

Faculty of Commerce

Program Outcomes (POs) for B.Com Programme

PO1:	**Disciplinary Knowledge:** Demonstrate a blend of conventional discipline knowledge and its applications to the modern world. Execute strong theoretical and practical understanding generated from the chosen programme.
PO2:	**Critical Thinking and Problem solving:** Exhibit the skill of critical thinking and use higher order cognitive skills to approach problems situated in their social environment, propose feasible solutions and help in its implementation.
PO3:	**Research-Related Skills:** Seeks opportunity for research and higher academic achievements in the chosen field and allied subjects and is aware about research ethics, intellectual property rights and issues of plagiarism. Demonstrate a sense of inquiry and capability for asking relevant/appropriate questions; ability to plan, execute and report the results of an research project be it in field or otherwise under supervision.
PO4	**Personal and professional competence:** Equip with strong work attitudes and professional skills that will enable them to work independently as well as collaboratively in a team environment.
PO5	**Effective Citizenship and Ethics:** Demonstrate empathetic social concern and equity centred national development; ability to act with an informed awareness of moral and ethical issues and commit to professional ethics and responsibility.
PO6	**Environment and Sustainability:** Understand the impact of the scientific solutions in societal and environmental contexts and demonstrate the knowledge of, and need for sustainable development.
PO7	**Self-directed and Life-long learning:** Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.

Program Outcomes (POs) for M.Com Programme

PO1:	**Disciplinary Knowledge:** Demonstrate comprehensive knowledge and a strong theoretical grounding in their area of work.
PO2:	**Critical Thinking and Problem solving:** Identify problems by closely examining the situations around them and think holistically about the phenomena and generate viable solutions to these problems. Exhibit the skill of critical thinking and understand scientific texts and place scientific statements and themes in contexts and also evaluate them in terms of generic conventions. Identify the problem by observing the situation closely, take actions and apply lateral thinking and analytical skills to design the solutions.
PO3:	**Social competence and communication skills:** Demonstrate ability to accommodate the views of others and present their own opinions and complex ideas, in written or oral form, in a clear and concise manner in group settings. Exhibit thoughts and ideas effectively in writing and orally; communicate with others using appropriate media, build effective interactive and presenting skills to meet global competencies. Elicit views of others, present complex information in a clear and concise and help reach conclusion in group settings.
PO4	**Research-related skills and Scientific temper:** Infer scientific literature, build a sense of enquiry and be able to formulate, test, analyse, interpret and establish hypothesis and research questions; and to identify and consult relevant sources to find answers. Able to plan and write a research paper/project while emphasizing on academics and research ethics, scientific conduct and creating awareness about intellectual property rights and issues of plagiarism.
PO5	**Trans-disciplinary research competence:** Create new conceptual, theoretical, methodological innovations that integrate and transcend beyond discipline-specific approaches to address a common problem.
PO6	**Personal and professional competence:** Perform independently and also collaboratively as a part of a team to meet defined objectives and carry out work across interdisciplinary fields. Execute interpersonal relationships, self-motivation and adaptability skills and commit to professional ethics.
PO7	**Effective Citizenship and Ethics :** Demonstrate empathetic social concern and equity centred national development and act with an informed awareness of moral and ethical issues and commit to professional ethics and responsibility.
PO8	**Environment and Sustainability:** Understand the impact of the scientific solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO9	**Self-directed and Life-long learning:** Demonstrate attitudes of being a life-long learner who passionately pursues self-determined goals in the broadest context of socio-technological changes. Acquire the ability to engage in independent and life-long learning in the broadest context of socio-technological changes.

Programme Specific Out Comes
B. Com.
After Completion of Graduation in Commerce (Business Administration), the student's will be able

1. To know the administrative activities of business organisation.
2. To understand the role of business organisation in society.
3. To enhance and perform the skills required as an employee.
4. To prepare the administrative reports of business organisation.
5. To analyzed the functions of business organisations.

Programme Specific Out Comes
B. Com.
After Completion of Graduation in Commerce (Cost and Works Accounting), the student's will be able

1. To understand the various concepts of cost and works accounting.
2. To prepare the cost sheet.
3. To classify the various cost of productions.
4. To know the role of overheads in cost of production.
5. To know the various costing methods and their applications in industry.

Programme Specific Out Comes
B. Com.
After Completion of Graduation in Commerce (Marketing Management), the student's will be able

1. To understand the various concepts of Marketing.
2. To know the role of advertisement and its impact on society.
3. To prepare marketing plan of an organisation.
4. To collect primary data for marketing analysis.
5. To implement the various functions of marketing department.

Course Out Comes
F. Y. B. Com. Semester I

1. Financial Accounting – I (PR - 112)

After Completion of Financial Accounting – I of Semester I, the students will be able:

a. To understand the basic concepts of financial Accounting in business world.
b. To understand and apply the process of piecemeal distribution of cash after dissolution of partnership firm.
c. To aware the applications of basic concepts of financial accounting in business world.
d. To impart the skill of GST Registration process.

2. Business Mathematics and Statistics (PR- 114 A)

After Completion of Business Mathematics and Statistics – I of Semester I, the students will be able:

a. To understand the basic concepts in Finance and Business Mathematics and Statistics
b. To familiar with application of Statistics and Mathematics in Business
c. To understand basic concepts in Statistics
d. To acquire elementary statistical method for analysis of data.

3. Computer Concepts and Applications (PR- 114 B)

After Completion of Computer Concepts and Applications – I of Semester I, the students will be able:

a. To familiar with Computer environment, network, internet.
b. To understand basics of operating system and business communication tools.
c. To acquire application of internet in commerce
d. To aware about e-commerce and M-Commerce

4. Marketing and Salesmanship-I (PR- 116 c)

After Completion of Marketing and Salesmanship – I of Semester I, the students will be able:
a. To understand basic concepts in Marketing
b. To understand the basic knowledge of Market segmentation, Marketing Mix, Product and Product Mix
c. To implement knowledge in practicality by enhancing their skills in the field of Marketing

5.Banking and Finance (PR- 115 b)

After Completion of Banking and Finance– I of Semester I, the students will be able:
a. To understand knowledge of fundamentals of banking
b. To aware various banking concepts.
c. To understand banking operation

6. Business Environment and Entrepreneurship (PR- 236 g)

After Completion of Business Environment and Entrepreneurship– I of Semester I, the students will be able:
a. To understand the concept of Business Environment and its aspects
b. To make students aware about the Business Environment issues and problems of Growth
c. To examine personality competencies most common to majority of successful entrepreneurs and to show how these competencies can be developed or acquired
d. To understand the difference between Entrepreneurial and non-Entrepreneurial behaviour

7. Organizational Skill Development (PR-115 a)

After Completion of Organizational Skill Development– I of Semester I, the students will be able:
a. To introduce the students to the emerging changes in the modern office environment
b. To develop the conceptual, analytical, technical and managerial skills of student's efficient office organization and records management
c. To develop the organizational skills of students
d. To develop technical skills among the students for designing and developing effective means to manage records, consistency and efficiency of work flow in the administrative section of an organisation
e. To develop employability skills among the students

Semester II

1. Financial Accounting – II (PR 122)

After Completion of Financial Accounting – I of Semester II, the students will be able:
a. To understanding the meaning of Computerized Accounting system.
b. To get the knowledge about various software's used in accounting.
c. To prepare the final account of charitable trust.

d. To identify the tangible and intangible asset.
e. To get the knowledge of Lease and maintain the books of Royalty.

2. Business Mathematics and Statistics (PR- 124 A)

After Completion of Business Mathematics and Statistics– I of Semester II, the students will be able:

a. To introduce the basic concepts in Finance and Business Mathematics and Statistics
b. To familiar the students with applications of Statistics and Mathematics in Business
c. To acquaint students with some basic concepts in Statistics.
d. To learn some elementary statistical methods for analysis of data.
e. The main outcome of this course is that the students are able to analyse the data by using some elementary statistical methods

3. Computer Concepts and Applications (PR- 124 B)

After Completion of Computer Concepts and Applications – I of Semester II, the students will be able:

a. To understand the concepts of E-Commerce tools, E- Marketing.
b. To application of EPS, M-Commerce

4. Marketing and Salesmanship (PR- 126 c)

After Completion of Marketing and Salesmanship – I of Semester II, the students will be able:

a. To introduce the concept of Salesmanship.
b. To give insight about various techniques required for the salesman.
c. To inculcate the importance of Rural Marketing.
d. To acquaint the students with recent trends in marketing and social media marketing.

5.Banking and Finance (PR- 125 b)

After Completion of Banking and Finance – II of Semester II, the students will be able:

a. To develop the working capability of students in banking sector
b. To Make the Students aware of Banking Business and practices.
c. To enlighten the students regarding the new concepts introduced in the banking system.

6. Business Environment and Entrepreneurship (PR- 126 e)

After Completion of Business Environment and Entrepreneurship – I of Semester II, the students will be able:

a. Understanding the difference between entrepreneurial and non-entrepreneurial personality.
b. Providing knowledge and significance of entrepreneurship Skill-Realising role of entrepreneurship in economy
c. Gaining knowledge of various institutions promoting entrepreneurship Skill-Acquaintance with these institutions
d. Getting inspiration from the entrepreneurs Skill-Developing entrepreneurial Personality by getting inspiration from the entrepreneurs

7. Organizational Skill Development (PR -126 a)

After Completion of Organizational Skill Development

– II of Semester II, the students will be able:

a. To imbibe among the students the qualities of a good manager and develop the necessary skill sets
b. To develop the technical skills of the students to keep up with the technological advancements and digitalization
c. To develop the communication skills of students and introducing them to The latest tools in communication
d. To develop writing, presentation, interpersonal skills of the students for effective formal corporate reporting.
e. To educate the students on the recent trends in communication technology And tools of office automation

S. Y. B. Com. Semester III

1. Business Communication-I (PR- 231)

After Completion of Business Communication– I of Semester III, the students will be able:

a. To understand the concept, process and importance of communication.
b. To acquire and develop good communication skills requisite for business correspondence.
c. To develop awareness regarding new trends in business communication.
d. To provide knowledge of various media of communication.
e. To develop business communication skills through and exercises.

2. Corporate Accounting (PR-232)

After Completion of Corporate Accounting – I of Semester III, the students will be able:

a. To acquaint the student with knowledge about various Concepts, Objectives and applicability of some important accounting standards associated with to corporate accounting.
b. To develop understanding among the students on the difference between commencement and incorporation of a company and the accounting treatment for transactions during the two phases.
b. To update the students with knowledge for preparation of final accounts of a company as per Schedule III of the Companies Act 2013
c. To empower to students with skills to interpret the financial statements in simple and summarized manner for effective decision-making process.

3. Business Management –I (PR- 234)

After Completion of Business Management– I of Semester III, the students will be able:

a. To provide basic knowledge and understanding about various concepts of Business Management.
b. To help the students to develop cognizance of the importance of management principles.
c. To provide an understanding about various functions of management.
d. To provide them tools and techniques to be used in the performance of the managerial job.

4. Elements of Corporate Law – I (PR-235)

After Completion of Elements of Corporate Law–I of Semester III, the students will be able:

a. To develop general awareness of Elements of Company Law among the students.

b. To understand the Companies Act 2013 and its provisions.
c. To have a comprehensive understanding about the existing law on formation of new company in India.
d.To create awareness among the students about legal environment relating to the company law.
e.To acquaint the students on e-commerce, E governance and e-filling mechanism relating to Companies.

5. Business Administration- I (PR-236 a)

After Completion of Business Administration– I of Semester III, the students will be able:
a. To provide basic knowledge about various forms of business organizations
b. To acquaint the students about business environment and its implications thereon.
c. To make them aware about the recent trends in business.

6. Cost and Works Accounting – I (PR-246 e)

After Completion of Cost &Works Accounting – I of Semester III, the students will be able:
a. To know and understand the basic concepts of Cost Accounting.
b. To get the idea of elements of cost and classification of costs.
c. To prepare the cost sheet for particular product for a specific period.
d. To know the purchase process of an organisation.
e. To apply the methods of inventory control.

7. Marketing Management (PR- 246 h)

After Completion of Marketing Management– I of Semester III, the students will be able:
a. To introduce the concept of Marketing Management.
b. To give the students the basic knowledge of Marketing Management to be a successful modern marketer.
c. To inculcate knowledge of various aspects of marketing management through practical approach.
d. To interpret the issues in marketing and their solutions by using relevant theories of marketing management.

S. Y. B. Com Semester IV

1. Business Communication-II (PR-241)

After Completion of Business Communication– II of Semester IV Business Communication, the students will be able:
a. To understand the concept, process and importance of communication.
b. To acquire and develop good communication skills requisite for business correspondence.
c. To develop awareness regarding new trends in business communication.
d. To provide knowledge of various media of communication.
e. To develop business communication skills through the application and exercises.

2. Corporate Accounting-II (PR- 242)

After Completion of Corporate Accounting– II of Semester IV, the students will be able:
a. To acquaint the student with knowledge of corporate policies of investment for expansion and growth through purchase of stake in or absorption of smaller

units.
b. To develop the knowledge among the student about consolidation of financial statement with the process of holding.
c. To update the students with knowledge of the process of liquidation of a company
d. To introduce the students with the recent trends in the field of accountancy

3. Business Management-II (PR- 244)

After Completion of Business Management– II of Semester IV, the students will be able:
a. Students will get an idea about the basic motivational tools used in the field of management.
b. Students will get an idea about how leadership influences organizational success.
c.Students will understand the significance of coordination and control in modern business management
d. Students will come across various emerging trends in management.

4. Elements of Corporate Law-II (PR- 245)

After Completion of Elements of Corporate Law– II of Semester IV, the students will be able:
a. To develop general awareness among the students about management of company
b. To have a comprehensive understanding about Key managerial Personnel of company and their role in Company administration.
d. To acquaint the students about E Governance and E Filling under the Companies Act, 2013.
d. To equip the students about the various meetings of Companies and their importance.
e. To make students capable of becoming good human resource of the corporate sector.

5. Business Administration-II (PR- 246 a)

After Completion of Business Administration– II of Semester IV, the students will be able:
a. To develop a better understanding of the legal compliances in business
b. To understand the term productivity and its importance in business administration
c. To develop an understanding of the various forms of liasoning required in business administration
d. Getting acquainted with the growth strategies of business

6. Cost and Works Accounting – II (PR- 246 e)

After Completion of Cost &Works Accounting – II of Semester IV, the students will be able:
a. To identify and understand the documents required in purchase and store departments.
b. To get the knowledge of preparation of store ledger.
c. To calculate the Labour cost by time and piece rate method.
d. To get the idea of Labour turnover, job analysis and job evaluation.
e. To understand the meaning of just in time, Computer aided manufacturing and enterprise resource planning.

7. Marketing Management (PR- 246 h)

After Completion of Marketing Management– I of Semester III, the students will be able:

a) Students will get knowledge of the basics of salesmanship which is a vital aspect of to gain the insights about recent trends in marketing field.
marketing.
b) It will help the students to gain insights about Rural Marketing and its uniqueness.
c) It will help the students to gain the insights about recent trends in marketing field.

T. Y. B. Com
2019 Pattern Semester V

1.(351) Business Regulatory Frame Work

After Completion of Business Regulatory Frame Work– I,the students will be able:
a. To understand the basic concepts, terms & provisions of Mercantile and Business Laws.
b. To develop the awareness regarding these laws affecting business, trade and commerce.

2.(352) Advanced Accounting

After Completion of Advanced Accounting – I, the students will be able:
a. To impart the knowledge of various accounting concepts
b. To inculcate the knowledge about accounting procedures, methods and techniques.
c. To acquaint the knowledge with practical approach to accounts writing by using software package.

3.(354) Auditing and Taxation

After Completion of Auditing and Taxation, the students will be able:
a. To acquaint themselves about the concept and principles of Auditing, Audit process, Assurance Standards, Tax Audit, and Audit of computerized Systems.
b. To get knowledge about preparation of Audit report.
c. To understand the basic concepts and to acquire knowledge about Computation of Income, Submission of Income Tax Return, Advance Tax, and Tax deductedat Source, Tax Collection Authorities under the Income Tax Act, 1961.

4.(355-a) Business Administration II

After Completion of Business Administration II, the students will be able:

- To acquaint the students with basic concepts & functions of HRD and nature of Marketing functions of a business enterprise.

5.(355-e) Cost and Works Accounting II

After Completion of Cost &Works Accounting – II, the students will be able:
a. To understand the accounting process of overheads.
b. To analyses the overhead cost in cost of production.
c. To calculate the primary and secondary distribution of overheads.
d. To apply the various methods of costing in production and service industries.
e. To apply the process of job costing method.

6. (355-h) Marketing Management II

After Completion of Marketing Management – II, the students will be able:

a. To understand the concept and functioning of marketing planning and sales management

b. To know marketing strategies and organization

c. To inform various facets of marketing with regulatory aspects

d. To understand marketing in globalize scenario

7.(PR-356-a) Business Administration III

After Completion of Business Administration – III, the students will be able:

- To acquaint the students with the basic concepts in finance and production functions of a business enterprise.

8.(356-e) Cost and Works Accounting III

After Completion of Cost &Works Accounting – II, the students will be able:

a. To impart knowledge regarding costing techniques.

b. To provide training as regards concepts, procedures and legal Provisions of cost audit.

9.(356-h)Marketing Management III

After Completion of Marketing Management – III, the students will be able:

a. To know detailing of Marketing Research

b. To understand the role Brand and Distribution Management in marketing

c. To inform about Marketing and Economic envelopment

d. To Know of the importance of control on marketing activities

Semester VI

Business Regulatory Framework (361)

1. To develop general awareness of Business Law among the students.
2. To understand the various statutes containing regulatory mechanism of business and its relevant provisions including different types of partnerships.
3. To have a understanding about the landmark cases/decisions having impact on business laws
4. To create awareness among the students about legal environment relating to the business activities and new ways dispute resolutions provided under Arbitration Act.
5. To acquaint the students on relevant developments in business laws to keep them updated.
6. To enhance capacity of learners to seek the career opportunity in corporate sector and as a business person.

ADVANCED ACCOUNTING – II (362)

1. To acquaint the student with knowledge about the legal provisions regarding preparation and presentation of final accounts of Co-operative Societies.
2. To empower to students about the branch accounting in simple.

3. To make aware the students about the conceptual aspects of various recent trends in the field of accounting especially forensic accounting, accounting of CSR activities, accounting of derivative contracts and Artificial Intelligence in Accounting.
4. To understand the procedure and methods of analysis of financial statements.

Auditing & Taxation – II (364)

1. To understand the basic concepts of Income Tax Act, 1961 and create awareness of direct taxation among the students.
2. To understand the income tax rules and regulations and its provisions.
3. To have a comprehensive knowledge of calculation various types of income.
4. To know the recent changes made by the finance bill (Act) every year and its impact on taxation of person.
5. To acquaint the students on Income tax department portal (ITD), e-filing and e-services mechanism relating to Assesses.

Business Administration – II (Marketing) (365 a)

1. To acquaint the student with knowledge about Marketing, Marketing Concepts identification on various types of markets.
2. To develop understanding among the students on the various elements of Marketing Mix and Market Segmentation.
3. To update the students with knowledge on varied dimensions of Product Management, Branding and Pricing Management
4. To update the students with the knowledge on various aspects of Promotion and Distribution and to update them on the recent trends in the field of Marketing.

Cost and Works Accounting. Special Paper II (365E)

1. To provide knowledge about the various methods of costing.
2. To understand the applications of different methods of costing in manufacturing and service industries.
3. To enable students to prepare cost statements under different types of manufacturing industries and Service Industries
4. To build the applicability of cost accounting standards in the method of costing.

Marketing Management-II (365h)

The primary purpose of this course is to brief students about agricultural marketing, various marketing regulations, importance of global marketing and various measures used by cyber security marketers in today's digital world.

Business Administration – III
(Production and Operations Management) (366a)

1. To acquaint the student with knowledge of Production Management and Production Functions
2. To equip the students with knowledge for efficient Inventory Management and the recent development in the area Inventory Management
3.. To introduce the students to the concept of Quality Management and to motivate to adopt quality management even in the regular lifestyle
4. To update the students with the knowledge of Logistics Management.

Cost and Works Accounting III (366 E)

1. To impart knowledge about Standard Costing and Variance Analysis
2. To learn about pricing policy and its implementation.

3. To know the related Cost Accounting Standards and Cost Management practices in specific sectors
4. To provide a conceptual understanding of procedures and Provisions of Cost Audit.

Marketing Management III 366(H)

1. To introduce the concept of Marketing of Service.
2. To provide the students the knowledge of Creative Advertisements.
3. To acquaint the students to various social media marketing.
4. To make the student understand the technique and process of Marketing Control and Audit.
5. To enable the students to apply this knowledge in practicality by enhancing their skills in the field of advertising.

M.Com I Semester I

1. Management Accounting – I (PR 101)

After Completion of **Management Accounting**, the students will be able:

a. To understand the concept of Financial Accounting and its limitations, emergence of Management Accounting and Cost Accounting, its advantages and distinction between Management Accounting and Cost Accounting.
b. To understand the concept of Marginal Costing, its applications, different techniques of managerial cost accounting and fixed and Variable Cost Analysis in decision making process.
c. To understand the concept of budget and budgetary control, types of budgets and preparation of functional budgets in an organization.
d. To understand the concept of Working Capital Management, determination of working capital, components of working capital and accounts receivable and inventory management.

2. **Strategic Management – I (PR 102)**

After Completion of **Strategic Management**, the students will be able:

a. Understanding of the concept of Strategic management and the process of Strategic Management
b. Understanding the External and Internal Business Environment for effective Strategy formulation Development of Strategic analytical skills Skills to design an effective Strategic Plan
c. Development of Applicability skills for effective plan implementation Developing Technical skills for evaluation of alternatives and analytical skills for choice among alternatives
d. Development of Technical and Analytical abilities for formulation of sound functional Strategy in various areas of business Development of Analytical and Managerial Abilities for critical evaluation

3.**Production & Operation Management –I (PR-113)**

After Completion of **Production & Operation Management**, the students will be able:

a. Acquaint the students' knowledge about Production and Operation management. Recognize the inherent conflict of interest in many business decisions relating to safety consideration and environmental aspects.
b. Understanding the scope and Process of Supply Chain Management Knowledge on various career opportunities in
c. Acquaint the students with knowledge of Production Planning and Control. Motivate the students to develop and innovate ideas for Product Design and

Development
d. Recognize the importance of Total Quality Management Identification of emerging issues in Production and operation Management

4. Financial Management – I (PR 114)
After Completion of **Financial Management**, the students will be able:
a. Understanding Financial Management Recognizing the Financial System of India.
b. Understanding Financial Statements Analysing the Financial Statements
c. To enable the students to make Investment Decisions, to study the Capital Budgeting Techniques
d. To understand the meaning and nature of Working Capital, to enable the students to formulate Credit and Collection policy

M.Com I Semester II

1. Financial Analysis & Control (PR-201)
After Completion of **Financial Analysis & Control**, the students will be able:
a. Understanding basics of financial analysis.
b. To gain knowledge of practically comparing financial results of different years and different companies.
c. To understand the importance of cash liquidity in an organization. To understand the computation of cash and fund flows under operating, investing and financing categories.
d.To develop the skill of appropriate Students will know about industrial finance and its sources
e. Students will understand problems of small and micro industries in India use of different ratios to evaluate the financial performance of entities.

2.Industrial Economics (PR-202)
After Completion of **Industrial Economics**, the students will be able:
a. Will get an overview of industrial economics, Will know about the concepts used in industrial economics.
b. Students will understand the theories of industrial location, Students will know about industrial imbalance in India

3. Business Ethics & Professional Values (PR
After Completion of **Business Ethics & Professional Values**, the students will be able:
a. To understand How companies ethically operate
b. To understand how CSR activities help the society for better living
c. To understand how ethical practices can be adopted in different areas
d. Awareness on the importance of environmental issues and Sustainable Development

4.Elements of Knowledge Management
After Completion of **Elements of Knowledge Management**, the students will be able:
a. Conceptual Clarity

b. Analytical ability
c. Application Oriented Skills
d. Managerial skills

M. Com II Semester III

1. **Business Finance (PR-301)**

After Completion of **Business Finance**, the students will be able:

a. Students will be able to understand the role and importance of corporate finance, and learn the calculation value of money
b. Students will be able to understand the financial planning, theories of capitalization and estimation of finance need of firm.
c. Students will be able to learn the sources of finance to be tapped for running business successfully.
d. Students will be able to apply best practice in working capital management.

2. Research Methodology for Business (PR-302)

After Completion of Research Methodology for Business, the students will be able:

a. To understand the research and research activities.
b. To get the idea of research process
c. To know the utilization of library and computer in research work.
d. To prepare the questionnaire for primary data collection.
d. To prepare a project report on a specific topic related with commerce.

3.Organizational Behaviour (PR- 314)

After Completion of **Organizational Behaviour**, the students will be able:

a. The Definition and meaning of organizational Behaviors, Able to cope with the role of technology in organization. Describe the theoretical and conceptual framework of Organizational Behavior Analyze the impact of globalization on OB
b.The explain the horizontal and virtual designs, Understand the characteristics organizational culture. Identify the process of impression management, define the concept of Personality. Explain the attributes of personality and various dimensions of attitude.
c. The defines the concept of motivation. Capacity to describe the types of motives. Capacity to analysis motivational process. Describe the theory of motivation. The definition of Emotional Intelligence, and explain the characteristics and Importance.
d. The definition of stress, describe the causes of stress. Describe the effects of stress. The definition of Conflict and describe the types of conflict. The definition of Group and team. Explain the types of Teams and Team building.

4. **Human Resource Management (PR- 313)**

After Completion of **Human Resource Management**, the students will be able:

a. The Definition and meaning of Human Resource Management, its Concept, Approaches, Functions Can identify that the HRM is profession or not.
Able to cope with the concept Human Resource Environment. Place of female employee in the organisation. Identify the changing Role of Human Resource Management.
b. The Objectives of Human Resource Planning and Development. Need and Estimation for Human Resource Planning and Development. Can understand

the recruitment and selection process. Understand the concept of Retention of Manpower, Succession Planning.

M. Com II Semester IV

1. Capital Market and Financial Services (PR-401)

After Completion of **Capital Market and Financial Services**, the students will be able:

a. To get the idea of various functions and participants of capital market
b. Aware about the process and functions of Stock Market.
c. To understand the concept and process of portfolio management.
d. Acquired the knowledge of financial services provide by the agencies.

2. Industrial Economic Environment (PR -402)

After Completion of **Industrial Economic Environment**, the students will be able:

a. Will understand the impact of economic and non –economic factors affecting industrial environment
b. Will understand role of various types of industries in India like small scale industries, public sector industries, MNCs etc
c. Critically evaluate industrial polices in India· Analyze the impact of new industrial policy adopted by India.
d. Will understand role, progress and problems of manufacturing and service industries in India

3. **Recent Advances in Business Administration (PR 403)**

After Completion of **Recent Advances in Business Administration**, the students will be able:

a. The Definition and meaning of change management and get the knowledge about the approach's management change and Important feature.
b. Able to know the challenges before customer centric organization
c. Able to identify to aquatint the role, importance and current trends in merger
d. Able to identify the concept and significance of Restructuring and Engineering of Business.

4. **Project Work in Business Administration (PR 404)**

After Completion of **Project Work in Business Administration** , the students will be able:

a. To understand the practical knowledge through project work.
b. Students will get skill for collection, analysis and interpret from information

Department of B. Voc. Food Processing Technology

Program Outcome:

Vocational Education is education that prepares the students for specific job role in various sectors in food processing industries and Professional organization. It trains the students from a trade, technician or professional position in R & D organizations for specific job roles. The program outcomes are the skills and knowledge which the students have at each exit level/at the time of graduation. These outcomes are generic and are common to all exit levels mentioned in the program structure.

I. Students with vocational training can find work in several state and central government organizations, non-profit groups, and academic institutions and in private sectors as well.
II. This program prepares students for specific types of occupations and frequently for direct entry into the market.
III. After completion of this program students will have enough competences, to get benefit from market opportunities.
IV. This program would enable students to update their knowledge and professional skills for entering the work force executing income generating activities or occupying better positions
V. At each exit level of this program, students will be able to
   a) Apply knowledge of general education subjects and skill development subjects to the conceptualization of food processing technologies.
   b) Designing and formulation of new food products, on the basis of consumers demands, development of methodology/technologies of food processing, design that meet solutions needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
   c) Conduct and undertake investigations of problems of including design of processing technology for various type food, food analysis, food quality and safety aspects and interpretation of data in order to provide valid conclusions.
   d) Create, select and apply appropriate processing technology/techniques, resources, modern processing tools in order to improve the quality, safety and the shelf life fresh and process food.
   e) Communicate effectively on minimal processing activity and value addition to the farmers/producers/grower at large, such as being able to comprehend and write effective reports, design documentation and make effective presentations.
   f) Demonstrate understanding of the social, health, safety, legal and cultural issues and the consequent responsibilities relevant to Food processing.
   g) Understand and commit to professional ethics and responsibilities an norms/regulation for manufacturing of process food and its effects on health.

h) Understand the impact of food processing technologies solutions in a societal context and demonstrate technical know-how and understanding of food safety, quality for sustainable development.

Course Outcome:

- Students will be able to apply the scientific method to questions in food processing by formulating testable hypotheses, gathering data that address these hypotheses, and analyzing those data to assess the degree to which their scientific work supports their hypotheses.
- Students will be able to present scientific hypotheses and data both orally and in writing in the formats that are used by practicing scientists.
- Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.
- Students will be able to apply fundamental mathematical tools (statistics, calculus) and physical principles (physics, chemistry) to the analysis of relevant situations.
- Students will be able to use the evidence of comparative food processing to explain how the theory of evolution offers the only scientific explanation for the processing of the food. They will be able to use specific examples to explicate how descent with modification.
- Students will be able to demonstrate proficiency in the experimental techniques and methods of analysis appropriate for their area of specialization within food processing.

Programme specific outcome:

- Students will be able to define and explain major concepts in the Food Sciences.
- Student will be able to correctly use Food Processing instrumentation and proper laboratory techniques.
- Students will be able to communicate food processing knowledge in oral and written form.
- Students will be able to explain and apply the scientific method including designing and conducting experiments and testing food properties.
- Student will be able to recognize the relationship between structure and function at all levels: molecular, cellular, and chemical & physical property of food.
- Student will be able to demonstrate the ability to read, understand, and critically review scientific information.
- Student will be able to demonstrate ethical conduct in scientific activities.
- The programme also provides information regarding national and international foods law and regulations, Standards.

Course structure of B. Voc. Food Processing Technology

- **Diploma in Food Processing Technology**
  - **First year (Semester I & II)**

Semester I	
Paper code	**Title**
General Education component	
BVFP111G	Personality Development and Computer Fundamentals
BVFP112G	Fundamentals of Food and Nutrition
BVFP113G	Introduction to Food Processing
Skill Based Component	
BVFP111S	Personality Development and Computer Fundamentals
BVFP112S	Fundamentals of Food and Nutrition
BVFP113S	Introduction to Food Processing
Semester II	
General Education component	
BVFP121G	Grape Processing and Preservation
BVFP122G	Principles of Food Preservation
BVFP123G	Fish, Meat and Egg Processing Technology
Skill Based Component	
BVFP121S	Grape Processing and Preservation
BVFP122S	Principles of Food Preservation
BVFP123S	Fish, Meat and Egg Processing Technology

Advanced Diploma in Food Processing Technology

Second year (Semester III & IV)

Semester III	
Paper code	**Title**
General Education Component	
BVFP231G	Fundamental of Food Biochemistry

BVFP232G	Basics of Food Packaging
BVFP233G	Agro-Processing
Skill Based Component	
BVFP231S	Fundamental of Food Biochemistry
BVFP232S	Basics of Food Packaging
BVFP233S	Agro-Processing
Semester III	
General Education Component	
BVFP241G	Bakery and Confectionary
BVFP242G	Food Quality Assurance and Control
BVFP243G	Milk and Milk product Processing
Skill Based Component	
BVFP241S	Bakery and Confectionary
BVFP242S	Food Quality Assurance and Control
BVFP243S	Milk and Milk product Processing

- **Degree in Food Processing Technology**
  - **Third year (Semester V & VI)**

Semester V	
Paper code	**Title**
General Education Component	
BVFP 351G	Marketing, Retail Management and Entrepreneurship Development
BVFP 352G	Food Spoilage and Control
BVFP 353G	Food Industry Waste Management
Skill Based Component	
BVFP 351S	Marketing,Retail Management and Entrepreneurship Development
BVFP 352S	Food Spoilage and Control
BVFP 353S	Food industry Waste Management
Semester VI	

General Education Component	
BVFP 361G	Technology of Beverages
BVFP 362G	Food Processing Plant Designing and Documentation
BVFP 363G	Emerging Technologies in Food Industry
Skill Based Component	
BVFP364S	Industrial/ Institutional Project
BVFP365S	Preparation of Food Processing Plant Proposal

Department of B.Voc Electrical Appliances Maintenance and Repairing

Programme outcome, Programme specific outcome and Course outcome

Program Outcome:

- The Programme provides opportunities for students to develop and demonstrate knowledge and understanding skills, qualities and other attributes required for Electrical industry start-up.
- The Programme also provides to learn effective collaboration and communication in the scientific arena.
- Students may analyse the feedbacks between science and society.

Course Outcome:

- Students will be able to apply the scientific method to questions in electrical work by formulating testable hypotheses, gathering data that address these hypotheses, and analysing those data to assess the degree to which their scientific work supports their hypotheses.
- Students will be able to present scientific hypotheses and data both orally and in writing formats that are used by various electrical work.
- Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.
- Students will be able to demonstrate proficiency in the experimental techniques and methods of analysis appropriate for their area of specialization within Electrical work.

Program Specific outcome: B.Voc. Course (Electrical)

On successful completion of B.Voc Course (Electrical) the students are able to

- Students will be able to define and explain major concepts in the Electrical work.
- Student will be able to correctly use Electrical Knowledge in Various laboratory
- Students will be able to communicate Electrical knowledge in oral and written form.
- Students will be able to explain and apply the scientific method including designing and conducting experiments and testing Electrical equipment's.
- Student will be able to demonstrate the ability to read, understand, and critically review scientific information.
- Student will be able to demonstrate ethical conduct in scientific activities.
- The programme also provide information regarding national and international Electrical law and regulations, Standards.

Department of B.Voc Electrical Appliances Maintenance and Repairing(EAMR)

- **Program Outcome:**
  - The Programme provides opportunities for students to develop and demonstrate knowledge and understanding skills, qualities and other attributes required for Electrical industry start-up.
  - The Programme also provides to learn effective collaboration and communication in the scientific arena.
  - Students may analyse the feedbacks between science and society.

- **Course Outcome:**
  - Students will be able to apply the scientific method to questions in electrical work by formulating testable hypotheses, gathering data that address these hypotheses, and analysing those data to assess the degree to which their scientific work supports their hypotheses.
  - Students will be able to present scientific hypotheses and data both orally and in writing formats that are used by various electrical work.
  - Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.
  - Students will be able to demonstrate proficiency in the experimental techniques and methods of analysis appropriate for their area of specialization within Electrical work.

- **Program Specific outcome: B.Voc. Course (Electrical)(EAMR)**
  On successful completion of **B.Voc Course (Electrical)** the students are able to
  - Students will be able to define and explain major concepts in the Electrical work.
  - Student will be able to correctly use Electrical Knowledge in Various laboratory
  - Students will be able to communicate Electrical knowledge in oral and written form.
  - Students will be able to explain and apply the scientific method including designing and conducting experiments and testing Electrical equipment's.
  - Student will be able to demonstrate the ability to read, understand, and critically review scientific information.
  - Student will be able to demonstrate ethical conduct in scientific activities.
  - The programme also provide information regarding national and international Electrical law and regulations, Standards.

Subject Name with Code

Sr.No	Subject Code	Name of Subject
Semester I		
1	EAT11	Communication Skills
2	EAT12	Fundamentals of Electrical Technology
3	EAT13	Electrical Appliances-I
4	EAP11	Communication Skills
5	EAP12	Fundamentals of Electrical Technology
6	EAP13	Electrical Appliances-I
Semester II		
7	EAT21	Electrical Wiring
8	EAT22	Power Supplies
9	EAT23	Electrical Appliances-II
10	EAP21	Electrical Wiring
11	EAP22	Power Supplies
12	EAP23	Electrical Appliances-II
Semester III		
13	EAT31	Fundamentals of Computer
14	EAT32	Entertainment Electronics
15	EAT33	Refrigerator & Air Conditioning
16	EAP31	Fundamentals of Computer
17	EAP32	Entertainment Electronics
18	EAP33	Refrigerator & Air Conditioning
Semester IV		
19	EAT41	Business Communication
20	EAT42	Electrical Machines
21	EAT43	Laboratory Instruments- I
22	EAP41	Business Communication
23	EAP42	Electrical Machines
24	EAP43	Laboratory Instruments- I
Semester V		
25	EAT51	Entrepreneurship Development
26	EAT52	Lab Instruments II
27	EAT53	Lab Instruments III
28	EAP51	Entrepreneurship Development
29	EAP52	Lab Instruments II
30	EAP53	Lab Instruments III
Semester VI		
31	EAT61	Research Methodology
32	EAT62	Professional Practices
33	EAT63	Renewable energy Sources
34	EAP64	Electrical Workshop
35	EAP65	Industrial Training

Department of B.Voc Sustainable Agriculture

Programme Outcome

A BVoc programme aims at imparting education that builds specific job skills in students so that they can serve the industries better. After completing a degree or diploma in BVoc candidates can start working in their chosen field immediately. Courses on Vocational Education are not limited to students only, who are probably in college and school. This type of training can be imparted during the job as well. Such a job-oriented training is important for the economy, and ensures that there is no need for training in future in the career.

Programme Specific Outcome

Sustainable Agriculture focuses on agricultural science practices and research, including genetics and plant breeding, agricultural microbiology, soil science, entomology, plant pathology, and agricultural economics. In the field of agricultural science. This course is designed to prepare students to apply modern agricultural techniques and technologies in a real-world setting. Practicals are an essential part of the program. Through this curriculum, aspirants can canvass, provoke, challenge, and question people, places, things, and structures as part of the program, which helps them conceptualize and validate ideas.

The graduates will be able to

1. Fundamental and core knowledge & understanding of agricultural sciences.
2. Transfer relevant knowledge, skills and technology concepts to the producers and to support innovation.

Course Outcome

Sr. No.	Class	Course	Term	Course Outcome
1	Diploma in Sustainable Agriculture **Theory**	Personality development and Computer Fundamentals **BVDSUA111G**	I	After studying this course students will able to increase their communication skills. Students will able to increase their comprehension skills. Students will learn about the preparation of curriculum vitae and job applications and synopsis writing. Students will learn about Database, concepts and types, uses of DBMS in Agriculture, World Wide Web (WWW)
2		Fundamentals of Agronomy **BVDSUA112G**	I	After completing this course, students will learn about seeds and sowing, tillage and tilth, crop density and geometry. Students will learn about crop nutrition, manures and fertilizers, nutrient use efficiency and water resources. Students will learn about importance, classification of weeds, crop weed competition and

Sr. No.	Class	Course	Term	Course Outcome
				concepts of weed management.
3		Fundamentals of Horticulture **BVDSUA113G**	I	After studying this course Students will understand the basic horticulture biology, taxonomy, and morphology. Students will learn basic horticultural principles and practices. Students will learn different methods of propagation used in horticulture will understand the basic horticulture biology, taxonomy, and morphology.
4	**Practical**	Personality development and Computer Fundamentals **BVDSUA111S**	I	Students will know about listening and note taking, writing skills, oral presentation skills; field diary and lab record; indexing, footnote and bibliographic procedures Students will learn about MSOffice for document creation & Editing, Data presentation, interpretation and graph creation, uses of information technology in agriculture sciences
5		Fundamentals of Agronomy **BVDSUA112S**	I	The students are expected to understand to introduce the students to the fundamentals, principles, and recent developments in the subject area. Identification of crops, seeds, fertilizers, pesticides and tillage implements.
6		Fundamentals of Horticulture **BVDSUA113S**	I	After completing this course, Students will learn basic horticultural principles and practices. Students will learn different methods of propagation used in horticulture
7	**Theory**	Fundamentals of organic Farming **BVDSUA121G**	II	The main theme this subject is to acquaint students about the organic farming and reduce the impact of poisonous and harmful fertilizers and pesticides. Students will identify and explain the key principles and practices involved in maintaining soil fertility to explain plant productivity and health in organic systems, farming system
8		Fundamentals of soil and water **BVDSUA122G**	II	Students will be aware about the soil, its types, pedagogical and edaphological concept, earth spheres, different minerals and rocks Existing on earth. Students will be aware about soil forming processes and physical properties of the soil. Students will understand the concept of soil survey and classification, soil taxonomy and soil orders Students will learn about the importance of conservation of soil and water, Students will identify the degradation of water chemical and physical properties, Students will understand about different forms

Sr. No.	Class	Course	Term	Course Outcome
				of pollution
9		Fundamentals of Plant Breeding and Seed technology **BVDSUA123G**	II	Students will acquaint the physiology of the plants and familiarize the about the basic of plant breeding Students will learn about modes of reproduction and apomixes, self-incompatibility and male sterility- genetic consequences, cultivar options, Students will learn about centres of origin diversity, components of Genetic variation; Heritability and genetic advance
10	**Practical's**	Fundamentals of organic Farming **BVDSUA121S**	II	Students will understand preparation of Bio-fertilizers, Organic nutrient resources, Fundamentals of insect, pest, disease and weed management under organic mode of production
11		Fundamentals of soil and water Science **BVDSUA122S**	II	Study of soil moisture measuring devices, Measurement of field capacity, bulk density and infiltration rate, Measurement of irrigation water.
12		Fundamentals of Plant Breeding and Seed technology **BVDSUA123S**	II	Students will able to understand Genetic basis and methods of breeding cross pollinated crops, modes of selection, Study of floral structure of self-pollinated and cross pollinated crops. Emasculation and hybridization techniques in self & cross pollinated crops.

Department of Diploma in MLT

Programme Specific Outcome of Diploma MLT.

A candidate who has completed Diploma MLT will acquire

- Knowledge of different sectors of medical diagnostic field .
- Skills to perform tests that aid in diagnosis and treatment of disease.
- Skills necessary for inspecting diagnosis of diseases.
- Ability to solve various societal problems related to health.

Diploma M.L.T. Course Outcomes

Class	Subject code	Paper	Title	Cos: After successful completion of this course, student will be able to
D.M.L.T Sem I	**DMLTG111**	**I**	**Basics of Anatomy, physiology and laboratory procedures**	Describe human anatomy and physiology.
				Sketch and explain cardiovascular system.
				Draw and describe digestive system.
				Explain structure and function of urinary system.
				Describe and draw reproductive system.
				Illustrate nervous and endocrine system.
	DMLTG112	**II**	**Haematology and Blood Banking**	List different types of blood cells.
				Draw and describe hematopoietic system.
				Arrange reactions of blood clotting.
				Recognize normal and abnormal blood cells.
				Describe concepts of immunology.
				Explain basic principles of immonohematology.
	DMLTG113	**III**	**Basics of Computer and Communication skill**	Predict SWOT.
				Develop positive attitude.
				Set smart goals.
				Develop leadership qualities.
				Describe concept of Microsoft office.
				Explain use of internet.
	DMLTS111	**I**	**Basics of Anatomy, physiology and laboratory procedures**	Identify skeletal system.
				Read and analyse electrocardiogram.
				Measure heart rate and pulse rate.
				Check blood pressure.
				Sterilize laboratory glasswares.
				Standardise glasswares.

Class	Subject code	Paper	Title	Cos: After successful completion of this course, student will be able to
	DMLTS112	**II**	**Haematology and Blood Banking**	Collect blood sample for analysis.
				Calculate blood indices.
				Determine bleeding and clotting time.
				Identify blood group.
				Analyse compatibility of blood donor and recipient
				Observe and record functioning of blood bank.
	DMLTS113	**III**	**Basics of Computer and Communication skill**	Manage time.
				Develop communication skill.
				Draft CV.
				Deal with problem.
				Search data on internet.
				Preare manuscript using word and excel.
D.M.L.T Sem I	**DMLTG211**	**I**	**Microbiology**	Draw and describe structure of bacteria.
				Explain bacterial cultivation techniques.
				Illustrate different bacterial pathogen.
				Describe different viral pathogen.
				Explain fungal and protozoal pathogen.
				Describe concepts of chemotherapy.
	DMLTG212	**II**	**Clinical Pathology and biochemistry**	Calculate ingredient for standard solutions.
				Explain metabolism of biomolecules.
				Plan for urine analysis.
				Illustrate stool examination.
				Describe semen and CSF analysis.
				Illustrate automation in clinical biochemistry.
	DMLTG213	**III**	**Histopathology**	Define terms in histopathology.
				Plan processes involve in preparation of tissue section.
				Explain staining techniques of tissue sections.
				Describe decalcification of tissues.
				Illustrate methods of waste disposal.
				Outlines the services provided by hospital, histology laboratory.
	DMLTS 211	**I**	**Microbiology**	Prepare laboratory media
				Identify organism by different staining technique.
				Cultivate organism.
				Identify pathogen from clinical sample.
				Perform and interprete serological tests/
				Observe instruments and working microbiological laboratory.

Class	Subject code	Paper	Title	Cos: After successful completion of this course, student will be able to
	DMLTS 212	**II**	**Clinical Pathology and biochemistry**	Determine blood sugar level.
				Report kidney function.
				Interpreter lipid profile.
				Separate and determine amino acid.
				Determine blood electrolytes..
				Observe and record different techniques in pathology laboratory.
	DMLTS213	**III**	**Histopathology**	Identify the basic structures of cells and tissues.
				Fix the specimen.
				Decalcify the tissue.
				Prepare paraffin blocks.
				Take section from paraffin block
				Adopt skills necessary in pathology laboratory.

Department of Degree in B.VOC Yoga& Naturopathy

Outcomes of the course

- The students will be introduced to the essential elements of a yogic life style, the concept of health and disease and their remedies through yoga practice.
- At the end of the course the students will be able to understand traditional Indian Yoga systems; the philosophy of the Yoga systems and the new thought in Yoga movement in the country
- The programme will develop basic understanding of the human anatomy, the human physiology and a deeper understanding of the human systems.
- The students will be introduced to regular and rigorous practice (sadhana) of yoga practices that would make them disciplined and knowledgeable Yoga teachers.

Programme Outcomes

Bachelor of Yoga and Naturopathy

- To combine philosophical understanding of Spirituality with the modern scientific advancement to unearth the science behind Indian traditional practices and performances, directed towards research and application • Students will attain theoretical knowledge in the fields of Yoga and Spirituality.
- Students will be able to develop and be able to demonstrate a comprehensive understanding of Indian traditional practices and philosophies underlying the concept of Yoga.
- Students will be able to demonstrate the Yoga practices in correct and authentic forms.
- While reviving the ancient Indian Education system, the philosophy and practice of Yoga is carried forward by the student through Guru Parampara, establishing harmony between human beings and nature through eco-friendly life.
- Students should develop proficiency in teaching skills of Yoga, being spiritually rooted.
- Students will be trained to be Spiritually rooted, Socially productive, Intellectually Creative, Emotionally Balanced, Mentally Sound, and Physically

Program Specific Outcomes

Students of Yoga & Naturopathy degree Program at the time of graduation will be able to:

PSO.1 Demonstrate Comprehensive Knowledge & Understanding of the basis of Health & Disease & its management – Graduate should be able to assess the patients with the knowledge of basic medical sciences & correlate the physiological & pathological aspects of the disease & apply the knowledge & manage the disease by educating & making the concepts clear to patients or students

PSO.2 Demonstrate Skill Competency & Training - Develop the skills in competencies, and training that are required to deliver Naturopathy and Yoga health care system to the masses. Demonstrate skills in documentation of individual case details as well as morbidity data relevant to the assigned situation. Organize and supervise the chosen/assigned health care services, demonstrate adequate managerial skills in the clinic/hospital or the field situation. Develop skills as a self-directed learner; recognize continuing educational needs, select and use appropriate learning resources

PSO.3 Work with Self-directed approach & Social Relevance -Recognize the health needs of the community become aware of the contemporary advances and developments in the discipline concerned to Healthcare through Naturopathy & Yoga. Thus become proficient in their profession by developing scientific temper and improve educational experience.

PSO.4 Treat with Empathy, Moral & Human Values- Plan and devise measures in Naturopathy and yoga for the prevention and rehabilitation of patients suffering from disease and disability. In doing so demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behavior in accordance with the societal norms and expectations

PSO.5 Research attitude with Evidence Based Practice &Life-long Learning Approach Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to criticallyanalyze relevant published research literature. Acquire a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology

PSO.6 Behave ethically & in Tune with the Laws of the Land - Carry out professional obligations ethically and in keeping with the objectives of the national health policies and to fulfill the social and professional responsibilities as a Naturopathy and Yoga Physician through drugless therapies effectively and responsibly.

PSO.7 Be Environment friendly, Encourage Sustainability and have Individualized approach- Identify social, economic, environmental, biological and emotional determinants of health in a given case and take them into account while planning therapeutic, rehabilitative, and preventive and health promoting measures/strategies with sustainable approaches by educating the masses.

Course Outcomes

After the completion of the course, the student shall be able to:

a. Describe the physiological effects of various yogic practices like kriyas, asanas, pranayamas, mudras, bandhas, drishtis, Guided relaxation and Meditation.
b. Define rules and regulations of Yoga to be followed.

c. Understand the therapeutic aspects of Yoga as applied to different disease conditions.
d. Illustrate the concept of health and disease in yogic lore and role of stress in disease causation and management of the same with Yoga.
e. Analyze knowledge of Yoga therapy in managing various diseases; 6. Demonstrate usage of therapeutic aspect of Yoga in promotive, preventive, curative and rehabilitative therapy.

Dr. A.H. Kategaonkar Criterion – II Coordinator	Dr. D. N. Pawar IQACCoordinator	Dr. J.D. Sonkhaskar Principal

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