2.6.1 - 24.25

Teaching- Learning and Evaluation Key Indicator- 2.6 Student Performance and Learning Outcomes

2.6.1 QIM The institution has stated learning outcomes (Program and Course outcomes)/graduate attributes which are integrated into the assessment process and widely publicized through the website and other documents and the attainment of the same are evaluated by the institution) A : POs and COs Integrated in to curriculum B: POs and COs available on Institution website C : Attainment are evaluated

Cos and POs link available online College website

https://bbmj.in/data/2.6.1_Program_ourcomes/COs_POs-PSOs.pdf

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COs POs PSOs

Content	Sr. No
BA	1
BCom	2
B.Sc	3
M.Sc	4
Biotechnology	5
BCA	6

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POs & Cos for B.A

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Programme Outcomes - B. A.

PO1: **Social responsibility and awareness**: The students acquire knowledge in social sciences, literature and humanities which make them sensitive, helping them to grow their ability as responsible citizens. It also creates social consciousness.

PO2: Inculcation of human values: Students acquire the knowledge with human values framing the base to deal with various problems in life with courage and humanity.

PO3: Familiarize learners with the social and economic issues: Learners get familiarize with the social, economic, historical, geographical, political, ideological and philosophical tradition and thinking.

PO4: Communication and linguistic skills: Students acquire good communication and linguistic skills which is the need of modern time and essential for campus drives.

PO5: Competency: It empowers the graduates to appear for various competitive examinations or choose the post graduate programme of their choice.

PO6: Creativity: Students will acquire the sense of social service and creative ability and responsible citizen.

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COs : B. A English

B. A. English Paper II & IV: Reading Literature Aim of the Course

CO1: To enable students to read and appreciate various forms of literature and critically interact with them from different perspectives.

CO2: To introduce students to appropriate literary strategies to read literature.

CO3: To pinpoint how far literary language deviates from ordinary language.

CO4: To unravel many meanings in a literary text.

Paper IV: Semester Two Unit One: Methodology of Literature

CO1: Develop their appreciation for the purposes and pleasures of prose fiction and nonfiction.

CO2: Articulate ways that literary works construct values and ethical meanings.

CO3: Practice analytical reading on multiple examples of each genre chosen to illuminate different literary choices and conventions, including texts that are culturally and historically diverse.

CO4: Identify major features of literary form and construct arguments about the relationship between form and the work"s meaning.

CO5: To understand of various forms of literature, the ode, the lyric, the Sonnet, the novel and
dramatic type"s comedy and tragedy

CO6: To understand the various aspects of novel and drama

BA II English Optional

CO1: To enable students to read and appreciate various forms of literature and critically interact with them from different perspectives. Objectives of the Course

CO2: To introduce students to appropriate literary strategies to read literature.

CO3: To pinpoint how far literary language deviates from ordinary language.

CO4: To unravel many meanings in a literary text

Paper V &VII: LITERATURE IN ENGLISH 1550-1750 Paper V: Semester III

On successful completion of the course, the students will be able to:

CO1: Interpret various forms of literature.

CO2: Distinguish and analyze literary forms like essay, mock epic, drama and novel.

CO3: Compare and differentiate between literary language and ordinary language.

CO4: Unravel many meaning in literary text.

Paper VI & VIII: LITERATURE IN ENGLISH 1750-1900 Paper VI: Semester III

On successful completion of the course, the students will be able to:

CO1: Understand the literary forms of poetry: Ballad and dramatic monologue, romantic poetry, prose, play and novel in 18th century and 19th century.

CO2: appreciate the poems of S.T Coleridge and Robert Browning,

CO3: Comment on the themes and styles of Oscar Wilde"s play.

CO4: Understand plot, characters and setting in the novel of Thomas Hardy.

BA III English Optional

CO1: To introduce the students to Modern English Literature as production of the age.

CO2: To familiarize the students with the literary terms and introduce to them the various streams in literary criticism and develop in them skills for literary evaluation.

CO3: To help the students to approach and appreciate Indian literature in English and make them see its place among world literature in English.

CO4: To introduce the students to American literature and its diverse cultures reflected in its writing.

CO5: To make the students able to understand the background of English literature and help them to write on its development.

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CO6: To make the students understand how the literature of modern period relates to the important trends of the period.
CO7: To make the students aware of the fact that all readers are critics and introduce them to basic texts in criticism while developing critical thinking in them.
CO8: To introduce the students to the thematic concerns, genres and trends of both Indian Writing in English and American Literature.
CO9: To lead the students to see how texts are affected by the context.

Paper IX & XIII: Twentieth Century English Literature Semester V Contents: Unit One:

Poetry

On successful completion of the course, the students will be able to:
CO1: Understand how the literature of modern period relates to the important trends of 20th century.
CO2: Appreciate poem by T.S Eliot and W.B Yeats.
CO3: Comment on the themes of Osborne and G.B Shaw"s plays
CO4: Understand the plot, character setting in the novels of Kingsley Amiss and D.H Lawrence.

Paper X & XIV: Introduction to Literary Criticism and Terms Semester

On successful completion of the course, the students will be able to
CO1: Identify and discuss the classical Greek critics of literature.
CO2: Provide a brief overview of the major critical theories by critics like Aristotle, Sir Philip
Sidney, William Wordsworth and F.R. Leavis.
CO3: Learn the terms related to various genres of literature
CO4: Cultivate an understanding of major critical and interpretive methods

Paper XI & XV: Indian Writing in English

CO1: To introduce to nineteenth Century Reform Movements in India; the Indian National Movement; Rise of the Indian Novel; Caste-Class;
CO2: To make aware the students of social, political, and cultural issues reflected in Indian writing in English, with reference to Indian social reformations, freedom struggle, women education and empowerment in nineteenth century.
CO3: To appreciate the artistic and innovative use of language employed by the writers to instill the values and develop human concern in students through exposure to literary texts.
CO4: To familiarize the students with the emergence and growth of Indian Writing in English
in the context of colonial experience.
CO5: To discuss issues concerning Indian Writing in English such as the representation of culture, identity, history, constructions of nation, (post) national and gender politics, cross-cultural transformations.

Semester V Poetry:

On successful completion of the course, the students will be able to:
CO1: Understand the background of Indian English literature and its development.
CO2: Critically appreciate the themes in the poems of Nissim Ezekiel and Arun Kolatkar.
CO3: Understand and evaluate the themes, Plot, character in the plays of Girish Karnad and Vijay Tendulkar.
CO4: Appreciate the theme, setting, characters in the novels of Raja Rao and U.R Anantha Murthy

Paper XII & XVI: Project Work on History of English Literature

CO1: To understand the background of the English literature and help students to write on its

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development.
CO2: To write down the aspect of research methodology.
CO3: To write research papers.
CO4: To understand new trends, movements in English literature.
American literature in literary history.

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COs : Economics

B.A. Economics Micro Economics:

CO1: This paper is a foundation of economics.

CO2: To understand the meaning and scope of micro economics, the behavior of an economic agent, namely, a consumer, a producer, a factor owner and the price fluctuation in a market.

CO3: To study the behavior of a unit and analysis is generally static and in partial equilibrium framework.

Price Theory:

CO1: To understand various components regarding price determination under various types of markets.

CO2: To understand theory of production, Cost and revenue analysis, forms of market and factor pricing theories.

Indian Economy:

CO1: To study the analytical factor of the students, by highlighting an integrated approach to be functioning aspects of the Indian economy, keeping in view the scope for alternative approaches.

CO2: To study social, political and economic environment influencing policy decisions.

CO3: To develop all these themes, the courses are divided into specific modules.

Macro Economics:

CO: To study awareness of the basic theoretical framework underlying the field of macro economics.

Development Economics:

CO: To understand theories of development underlying the field of development economics.

International Economics:

CO1: To understand the basic principles that trend to govern the free flow of trade in goods and services at global level.

CO2: To understand and analyze the deference between various economies of the world.

Agricultural Economics:

CO1: To study the treatment of issues in agriculture economics to those intending to specialize in the area.

CO2: To familiarize students with policy issues those are relevant to Indian agricultural economics.

CO3: To analyze the issues using basic micro economics.

History of Economic Thought:

CO1: To understand basic ideas of classical, new classical and marginalist economist.

CO2: To compare the basic economic ideas of various economic thinkers of the world.

Money Banking and Finance:

CO1: Money and banking constitutes important components of modern economy.

CO2: To understand the operations of money and banking and their interaction with the rest of the economy is essential to realize how monetary forces operate.

CO3: To understand the monetary and banking system in India.

Public Finance:

CO1: To study the significance and scope of Public Finance.

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CO2: To provide detailed information about the fiscal policy, public revenue, public debt and public expenditure.

Statistical Methods:

CO1: To understand the techniques of statistical analysis which are commonly applied to economic problems.

CO2: To study the tools and techniques of stastistical methods.

CO3: To understand how to collect data, its presentation, analysis and making inferences.

Research Methodology:

CO1: To undertsad the social sciences research to the students of economics.

CO2: To know the importance of social research design. data collection and presentation of data.

CO3: To understand the idea of research in social sciences.

Industrial Economics:

CO: In the contemporary world with globalization and liberalization more and more attention is being given to industry. This paper strengthens the Students to deal or adjust with above situation.

Economy of Maharashtra:

CO1: To understand the basic features of the economy of Maharashtra.

CO2: To study the problems related agriculture, industries, cooperative sector and infrastructure in the Maharashtra state.

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COs : Hindi

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सामान्य हिंदी (SL – I & II) (बी.ए., बी. कॉम., बी. एस्सी.)

CO1: मानवीय संवेदनाओं का विकास हो जाता है और इंसानीयत को बढ़ावा मिलता है।

CO2: हिंदी कहानी साहित्य का परिचय मिल जाता है।

CO3: हिंदी के प्रमुख लेखक और और उनकी लेखन विशेषताओं का परिचय प्राप्त होता है।

CO4: विद्यार्थिओं के भाषा कौशल का विकास होता है।

CO5: विद्यार्थिओं में हिंदी भाषा के महत्व के साथ व्याकरणिक सजकता निर्माण होती है।

प्रश्नपत्र 1 – उपन्यास साहित्य

CO1: विद्यार्थियों की साहित्यिक अभिरूचि का विकास और साहित्य आस्वादन का आनंद देना।

CO2: इंसानी जीवन मूल्यों का विकास और उनके प्रति आस्था निर्माण करना।

CO3: उपन्यास साहित्य की बारिकियों से परिचित करना और हिंदी उपन्यास साहित्य की पहचान करना।

CO4: लेखन और भाषा कौशल का विकास करना।

प्रश्नपत्र 2 – नाटक साहित्य

CO1: हिंदी नाटकों और उसके बहाने साहित्य में नाट्य परंपरा, हिंदी रंगमच, अभिनय तथा व्यावसायिक नाटकों से परिचित करना।

CO2: 'विजयपर्व' नाटक से अशोक की जिंदगी का संघर्ष, युवराज से राजगद्दी और फिर राजगद्दी से निर्वाण तक के सफर का प्रयास युद्ध से शांति भली है की स्थितियों को बयां करता है। अतः विद्यार्थियों पर संघर्ष, रक्तपात, लडाई से शांति भली है के संस्कार हो जाता है।

CO3: 'होरी' नाटक प्रेमचंद का है। इस नाटक के अध्ययन के पश्चात् किसानों की दयनीयता, जमीन से जुडना, पारिवारिक संघर्ष आदि का परिचय मिला। विद्यार्थी भी पहले से किसान परिवारों से जुडे हैं, अतः 'होरी' नाटक में चित्रित पात्र उन्होंने अपने घरों में बसे हैं ऐसा एहसास किया है। बिना पढाई के क्या होता है इसका परिचय भी पाया है। अतः शिक्षा से आत्मनिर्भर बनने की प्रेरणा, सम्मान पाने की लालसा विद्यार्थियों में जगती है।

CO4: 'अलख आजादी की' नाटक भारतीय स्वतंत्रता का लेखा-जोखा प्रस्तुत करता है। आज जिस देश में हम रह रहे हैं, वह कहां से कहां तक का सफर कर चुका है, इससे विद्यार्थी परिचित हो गए हैं। घर-गांव और देश के प्रति देशभक्ति के भाव विद्यार्थियों में जगाने का काम इस नाटक से होता है।

CO5: 'नाटक साहित्य' पेपर के अध्ययन के बाद विद्यार्थियों में हिंदी नाटक साहित्य की बारिकियों को पहचानने की क्षमता का विकास, संवेदनाओं का विकास, नाट्य आस्वादन और नाटकों की आलोचना करने की दृष्टि का विकास हो गया है।

प्रश्नपत्र 3 - हिंदी गद्य साहित्य

CO1: हिंदी कहानी और व्यंग्य साहित्य का अध्ययन करना।

CO2: इंसानी जीवन मूल्यों और संवेदनाओं का विकास और उनके प्रति आस्था निर्माण करना।

CO3: साहित्य आस्वादन और मूल्यांकन क्षमता का विकास करना।

CO4: हिंदी साहित्य की गद्य विधाओं का परिचय करवाना।

प्रश्नपत्र 4 - एकांकी साहित्य

CO1: एकांकी नाटक की तुलना में छोटी विधा है। प्रथम सत्र में नाटकों का अध्ययन और द्वितीय सत्र में एकांकी का अध्ययन है। इससे विद्यार्थियों को नाटक और एकांकी के बिच का फर्क समझ में आता है।

CO2: हिंदी एकांकी के उद्भव और विकास से विद्यार्थी परिचित होता है।

CO3: एकांकी के माध्यम से मानवीय संवेदनाओं का अध्ययन हो गया और जीवन में मानवीय मूल्यों से विद्यार्थी परिचित हो गए। छोटी-छोटी घटनाओं का जीवन में क्या महत्त्व है, इसका परिचय भी विद्यार्थियों को हो गया है।

CO4: 'एकांकी नए पुराने' किताब के भीतर पांच प्रतिनिधिक एकांकियों को पढाई के लिए रखा है, जिससे ऐतिहासिक, सामाजिक और समस्यामूलक एकांकी कैसे होती है, इसका ज्ञान विद्यार्थियों को होता है।

CO5: 'प्रतिनिधिक महिला एकांकी' हिंदी महिला एकांकीकारों की एकांकियों का प्रतिनिधित्व करती है। महिलाओं के अनुभव जगत का बयान करता यह एकांकी संग्रह महिलाओं की मुश्किलों और पीडाओं को विद्यार्थियों के सामने रखता है। अर्थात इससे विद्यार्थी अपने घर-परिवार में रह रही महिलाओं के मुश्किलों से परिचित हो गए हैं।

सामान्य हिंदी (SL - III & IV) (बी.ए., बी. कॉम., बी. एस्सी.)

CO1: साहित्य आस्वादन अभिरूचि का परिसंस्कार करना।

CO2: जीवन मूल्यों के प्रति आस्था निर्माण करना।

CO3: हिंदी के आधुनिक गद्य साहित्य की प्रतिनिधिक रचनाओम का परिचय करना ।

CO4: अत्याधुनिक इलेक्ट्रॉनिक माध्यमों का परिचय करना।

CO5: व्यावहारिक, प्रयोजनमूलक तथा संप्रेषणमूलक व्यावसायिक हिंदी भाषा से विद्यार्थी परिचित हो और रोजमर्रा की जिंदगी में अपनी मांगों को पूरा करने में सक्षमता पाए यह अपेक्षा भी इस पाठ्यक्रम की रही है।

CO6: पत्रलेखन के सारे प्रकार, आवेदन पत्र, बैंकिंग तथा सरकारी कार्यालयों की प्रयोजनमूलक भाषा से विद्यार्थी परिचित होता है।

CO7: हिंदी साहित्य की कहानी, कविता, संस्मरण, रेखाचित्र, डायरी, आत्मकथा, जीवनी, निबंध, यात्रावृत्त, व्यंग्य, रिर्पोताज, पत्र आदि विधाओं का परिचय भी विद्यार्थी कर चुके हैं। जीवन मूल्य, भाव-भावनाओं, संवेदनाओं के परिचय के साथ आधुनिक साधनों का भाषाई प्रयोग कैसे करे इसका परिचय भी विद्यार्थी पाते हैं।

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प्रश्नपत्र 5 – आधुनिक साहित्य का इतिहास

CO1: हिंदी साहित्य के आधुनिक काल और परंपरा का परिचय करना।

CO2: हिंदी साहित्य के आधुनिक काल की पृष्ठभूमि और प्रवृत्तियों पर प्रकाश डालना।

CO3: हिंदी साहित्य के आधुनिक काल में कविता और गद्य लेखन के विविध प्रकारों का आकलन और मूल्यांकन।

CO4: साहित्य और युगबोध के अंतरसंबंधों का अध्ययन करना।

CO5: हिंदी साहित्य के सामाजिक और आधुनिक पहलुओं पर प्रकाश डालना।

CO6: इतिहासबोध का अध्ययन करना।

CO7: ऐतिहासिक आलोचना का अध्ययन करना

प्रश्नपत्र 6 – पाश्चात्य साहित्यशास्त्र

CO1: पाश्चात्य साहित्य चिंतन परंपरा का अध्ययन करना।

CO2: अद्यतन आलोचनात्मक दृष्टि का अध्ययन करना।

CO3: साहित्यालोचन क्षमता का परिचय करना।

CO4: साहित्य सृजन के संस्कार करना।

CO5: समीक्षात्मक दृष्टि का विकास करना।

CO6: साहित्य एक प्रकार से शास्त्र है, उसका पढ़ना, चिंतन, आकलन, मूल्यांकन और सृजन करना एक प्रकार की शास्त्रीय तकनीक है। इसी तकनीक का विकास करना इस पाठ्यक्रम का उद्देश्य है।

प्रश्नपत्र 7 – रीतिकालीन काव्य

CO1: रीतिकालीन कविता की पृष्ठभूमि का अध्ययन दरबारी संस्कृति के परिप्रेक्ष्य में करना।

CO2: रीतिबद्ध, रीतिसिद्ध औरव रीतिमुक्त कविता का अध्ययन करना।

CO3: रीतिकाल की पृष्ठभूमि और साहित्य लेखन की परंपरा का अध्ययन करना।

प्रश्नपत्र 8 – कहानी साहित्य

CO1: बीसवीं सदी की हिंदी कहानी परिचय करना।

CO2: हिंदी कहानी और प्रमुख कहानी आंदोलनों का परिचय करना।

CO3: हिंदी के प्रमुख कहानिकारों का परिचय करना।

CO4: समकालीन दलित विमर्श, स्त्री विमर्श और आदिवासी विमर्श का मूल्यांकन करना।

CO5: कहानी विधा का तात्विक विवेचन करना।

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CO8: रेडियो वार्ता लेखन, समाचार लेखन, मीडिया के विविध आयाम, हिंदी भाषा की व्यावसायिक उपयोगिता, बैंकों में हिंदी, वैश्वीकरण के परिप्रेक्ष्य में हिंदी भाषा का महत्व, उद्योग-व्यापार में हिंदी के सहारे कैसे आर्थिक प्रगति कर सकते हैं आदि बातों का परिचय करवाना।

प्रश्नपत्र 5 – कथेत्तर गद्य साहित्य

CO1: कथेत्तर गद्य साहित्य पेपर रखने का उद्देश्य यही है कि हिंदी के विद्यार्थी हिंदी साहित्य के कथेत्तर विधाओं से परिचित हो।

CO2: 'गद्य गौरव' और 'गद्य प्रभा' किताब के माध्यम से विद्यार्थी रेखाचित्र, निबंध, संस्मरण, जीवनीपरख लेख, व्यंग्य, आत्मकथा अंश, यात्रा वृतांत, लेख आदि विधाओं से भलीभांति परिचित हो।

CO3: साहित्य के विविध विधाओं के आस्वादन का आनंद लेने की आदत और अभिरुचि विकास भी विद्यार्थियों में करना।

CO4: हिंदी कथेत्तर गद्य संवेदना की परंपरा का परिचय करना।

CO5: जीवन मूल्यों के प्रति आस्था पैदा करना।

प्रश्नपत्र 6 – प्रयोजनमूलक हिंदी 1

CO1: हिंदी भाषा के प्रयोजनमूलक रूप का परिचय करना।

CO2: हिंदी भाषा की व्यावहारिकता पर प्रकाश डालना।

CO3: भारत देश की राष्ट्रभाषा होने के नाते हिंदी भाषा की एहमीयत का मूल्यांकन करना।

CO4: हिंदी के राष्ट्रीय और आंतर्राष्ट्रीय स्वरूप का मूल्यांकन करना।

CO5: आधुनिक तंत्र विज्ञान में हिंदी की उपयोगिता पर आकलन करना।

प्रश्नपत्र 7 – आधुनिक हिंदी कविता

CO1: हिंदी साहित्य के पद्य (कविता) के उद्भव और विकास पर प्रकाश डालना, हिंदी कविता के प्रति विद्यार्थियों की अभिरुचि की वृद्धि करना, मानवीय भाव-भावनाएं और संवेदनाओं का विकास करना इस पाठ्यक्रम का उद्देश्य है।

CO2: नागार्जुन द्वारा लिखित खंडकाव्य 'भूमिजा' रामायण के कथा प्रसंग पर प्रकाश डालता है। सीता का ऐतिहासिक मूल्यांकन करते हुए एक नारी के नाते उसकी कौनसी शिकायतें राजा, पति, पुरुष और राज्य के प्रति रही है इसका लंबा मूल्यांकन करना। अर्थात नारी जीवन के संघर्ष और विद्रोह का परिचय इस खंडकाव्य का उद्देश्य है।

CO3: विद्यार्थी 'रामायण', 'रामचरितमानस' तथा अन्य रामायण कथा पर केंद्रित रचनाओं से एक अलग रचना से परिचित हो गए हैं, जिसमें सीता का एक स्त्री होने के नाते पुरुषों के प्रति विद्रोह है इसका परिचय करवाना।

CO4: चुनी हुई लंबी कविताएँ पढ़ाई हेतु रखी है। कविता और खंडकाव्य के बिच का साहित्यिक पद्य रूप के नाते लंबी कविताओं का जाना जाता है। इन कविताओं के माध्यम से विद्यार्थी विविध भाव, रस से परिचित हो गए हैं। साथ ही आधुनिक जीवन की परेशानियाँ, भ्रमभंग, बाजारीकरण, अंधश्रद्धा का ताकतवर होना, शब्दों की एहमीयत आदि बातों का परिचित करवाना।

प्रश्नपत्र 8 – प्रयोजनमूलक हिंदी 2

CO1: हिंदी भाषा के विविध रूपों का परिचय करना।

CO2: राजभाषा हिंदी के विविध रूपों का परिचय करना।

CO3: प्रयोजनमूलक भाषा तथा अनुवाद की भूमिका का परिचय करना।

CO4: हिंदी भाषा के प्रयोजनमूलक और व्यावहारिक रूप का परिचय करना।

CO5: भारत देश की राष्ट्रभाषा होने के नाते हिंदी भाषा की एहमीयत का मूल्यांकन करना।

CO6: हिंदी के राष्ट्रीय और आंतर्राष्ट्रीय स्वरूप का मूल्यांकन करना।

CO7: आधुनिक तंत्र विज्ञान में हिंदी की उपयोगिता पर आकलन करना।

प्रश्नपत्र 9 – प्रादेशिक साहित्य

CO1: साहित्य आस्वादन और अभिरूचि का परिष्कार करना।

CO2: जीवन मूल्यों के प्रति आस्था निर्माण करना।

CO3: प्रादेशिक भाषा के साहित्य से परिचय करवाना।

CO4: भारतीय साहित्य का अध्ययन करना।

प्रश्नपत्र 10 – आदि तथा मध्यकालीन हिंदी साहित्य का इतिहास

CO1: हिंदी साहित्य के इतिहास तथा आरंभिक काल का परिचय करना।

CO2: हिंदी साहित्य के लेखन स्रोतों एवं परंपराओं पर प्रकाश डालना।

CO3: हिंदी साहित्य आदिकाल, भक्तिकाल और रीतिकाल का परिचय देना।

CO4: साहित्य आस्वादन और अभिरूचि का परिष्कार करना।

CO5: जीवन मूल्यों के प्रति आस्था निर्माण करना।

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प्रश्नपत्र 11 – साहित्यशास्त्र

CO1: साहित्य चिंतन परंपरा का अध्ययन करना।

CO2: साहित्यालोचन क्षमता का परिचय करना।

CO3: साहित्य सृजन के संस्कार करना।

CO4: साहित्य एक प्रकार से शास्त्र है. उसका पढ़ना. चिंतन. आकलन. मूल्यांकन और सृजन करना एक प्रकार की शास्त्रीय तकनीक है। इसी तकनीक का विकास करना इस पाठ्यक्रम का उद्देश्य है।

CO5: साहित्य का स्वरूप. तत्त्व. प्रयोजन. हेतु. शब्दशक्तियां. रस. अलंकार. छंद. विविध विधाओं का स्वरूप. आलोचना आदि अंगों का परिचय विद्यार्थियों को करवाना।

CO6: साहित्य और हिंदी भाषा के विद्यार्थी होने के नाते एक परिपूर्ण इंसान बनने और मानवीय जीवन का आकलन. बोध और मूल्यांकन करने की क्षमता का विकास हो यह इस पाठ्यक्रम का उद्देश्य है. अर्थात 'साहित्यशास्त्र' इस पाठ्यक्रम की पढ़ाई के बाद यह दृष्टि विद्यार्थियों लाना।

CO7: साहित्य का मूल्यांकन करने का नजरिया भी विकसित करना। साहित्य के कलापक्षीय अंगों पर प्रकाश डालने की दृष्टि का विकास करना।

प्रश्नपत्र 12 व 16 – प्रकल्प कार्य

CO1: पठन-पाठन और लेखन कौशलों का विकास करना।

CO2: आलोचनात्मक क्षमता का विकास करना।

CO3: अनुसंधात्मक दृष्टि का विकास करना।

CO4: प्रकल्प प्रस्तुति का तकनीक से परिचित करना।

प्रश्नपत्र 13 – मध्यकालीन काव्य

CO1: भारतीय भक्ति आंदोलन का अध्ययन करना।

CO2: रीतिकालीन संवेदनाओं का अध्ययन करना।

CO3: कविताओं के माध्यम से मध्यकालीन सांस्कृतिक संवेदना का अध्ययन करना।

CO4: भक्ति तथा रीतिकालीन पृष्ठभूमि और प्रवृत्तियों से विद्यार्थियों को परिचित करना।

CO5: साहित्य का चिंतन, आकलन और मूल्यांकन करना एक प्रकार की शास्त्रीय तकनीक है। इसी तकनीक का विकास करना इस पाठ्यक्रम का उद्देश्य है।

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प्रश्नपत्र 14 - आधुनिक हिंदी साहित्य का इतिहास

CO1: हिंदी साहित्य के आधुनिक काल का परिचय करना।

CO2: हिंदी साहित्य के आधुनिक काल की पृष्ठभूमि और प्रवृत्तियों पर प्रकाश डालना।

CO3: हिंदी साहित्य के आधुनिक काल में कविता और गद्य लेखन के विविध प्रकारों का आकलन और मूल्यांकन।

CO4: भारतीय स्वातंत्रता संग्राम में हिंदी साहित्यकारों ने कौनसी भूमिका निभाई और देशभक्ति से प्रेरित होकर कितना साहित्य लिखा इसका मूल्यांकन करना।

CO5: हिंदी साहित्य के सामाजिक और आधुनिक पहलुओं पर प्रकाश डालना।

प्रश्नपत्र 15 - साहित्यशास्त्र

CO1: साहित्य चिंतन परंपरा का अध्ययन करना।

CO2: साहित्यालोचन क्षमता का परिचय करना।

CO3: साहित्य सृजन के संस्कार करना।

CO4: साहित्य के रस अलंकार, छंद, विविध विधाओं का स्वरूप, आलोचना आदि अंगों का परिचय विद्यार्थियों को करवाना।

CO5: साहित्य की विविध विधाओं से विद्यार्थियों को परिचित करवाकर उसका तात्विक अध्ययन करना।

CO6: साहित्य का मूल्यांकन करने का नजरिया भी विकसित करना। साहित्य के कलापक्षीय अंगों पर प्रकाश डालने की दृष्टि का विकास करना।

CO7: विद्यार्थिओं में साहित्यालोचन की दृष्टि को विकसित करना।

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प्रश्नपत्र 9 – भारतीय साहित्य – 1

CO1: भारतीय साहित्य की अवधारणा का परिचय करना।

CO2: भारतीय भाषा साहित्य के अध्ययन की मदद से भारतीयता की पहचान करना।

CO3: तुलनात्मक अध्ययन की अवधारणा का अध्ययन करना।

CO4: भारतीय साहित्य के प्रतिनिधिक रचनाओं का अध्ययन करना।

प्रश्नपत्र 10 – भाषा विज्ञान

CO1: भाषा का वैज्ञानिक अध्ययन करना।

CO2: भाषा अध्ययन की प्रक्रिया का अध्ययन करना।

CO3: भाषा अध्ययन के ऐतिहासिक परिदृष्य का अध्ययन करना।

CO4: हिंदी भाषा के उद्भव और विकास का परिचय करना।

CO5: भाषा विकास और परिवर्तन का अध्ययन करना।

प्रश्नपत्र 11 – स्वतंत्रतापूर्व हिंदी कविता

CO1: स्वातंत्रतापूर्व हिंदी कविता के विकासक्रम का अध्ययन करना।

CO2: कविता के माध्यम से जनसंवेदना का अध्ययन करना।

CO3: स्वातंत्रतापूर्व काव्य रूपों का अध्ययन करना।

CO4: काव्यस्वादन तथा मूल्यांकन क्षमता का विकास करना।

प्रश्नपत्र 12 – प्रयोजनमूलक हिंदी

CO1: प्रयोजनमूलक भाषा तथा अनुवाद की भूमिका का परिचय करना।

CO2: हिंदी भाषा के प्रयोजनमूलक और व्यावहारिक रूप का परिचय करना।

CO3: भारत देश की राष्ट्रभाषा होने के नाते हिंदी भाषा की एहमीयत का मूल्यांकन करना।

CO4: हिंदी के राष्ट्रीय और आंतर्राष्ट्रीय स्वरूप का मूल्यांकन करना।

CO5: आधुनिक तंत्र विज्ञान में हिंदी की उपयोगिता पर आकलन करना।

CO6: प्रयोजनमूलक भाषा का सैद्धांतिक अध्ययन करना।

CO7: प्रयोजनमूलक भाषा कौशलों का विकास करना।

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प्रश्नपत्र 13 - भारतीय साहित्य - 2

CO1: भारतीय साहित्य की अवधारणा का परिचय करना।

CO2: भारतीय भाषा साहित्य के अध्ययन की मदद से भारतीयता की पहचान करना।

CO3: तुलनात्मक अध्ययन की अवधारणा का अध्ययन करना।

CO4: भारतीय साहित्य के प्रतिनिधिक रचनाओं का अध्ययन करना।

CO5: भारतीय साहित्य की अध्ययन की समस्याओं का अध्ययन करना।

प्रश्नपत्र 14 - हिंदी भाषा का इतिहास

CO1: हिंदी भाषा का संरचनात्मक अध्ययन करना।

CO2: हिंदी भाषा के विकासक्रम पर प्रकाश डालना।

CO3: हिंदी की बोलियों का अध्ययन करना।

CO4: देवनागरी लिपि के गुण-दोषों पर प्रकाश डालना।

प्रश्नपत्र 15 - स्वातंत्र्योत्तर हिंदी कविता

CO1: स्वातंत्र्योत्तर हिंदी कविता के विकासक्रम का अध्ययन करना।

CO2: स्वातंत्र्योत्तर हिंदी कविता के माध्यम से स्वातंत्र्योत्तर जनसंवेदना का अध्ययन करना।

CO3: स्वातंत्र्योत्तर काव्यरूपों का अध्ययन करना।

CO4: काव्यस्वादन तथा मूल्यांकन क्षमता का विकास करना।

CO5: कविता के कलापक्षीय अंगों पर प्रकाश डालने की दृष्टि का भी विकास करना।

प्रश्नपत्र 16 - माध्यमलेखन

CO1: जनसंचार के माध्यमों का अध्ययन करना।

CO2: माध्यमोपयोगी लेखन का सैद्धांतिक अध्ययन करना।

CO3: माध्यम लेखन कौशलों का विकास करना।

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COs : Sociology

B. A. Sociology B.A. Part-I, Semester I Paper no-I: - Introduction to sociology & Paper No-
II:-Individual & Society

CO1: Introduction to the basic concept of Sociology, subject matter & Importance of Sociology
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CO2: Understanding in brief the knowledge of human Society and the institutions and other structural elements

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CO1: Student of Sociology must have the Knowledge of those branches to understand the scope of sociology &its wideness.

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B.A. Part-II, Semester III Paper No-V: -Problems of Rural India Paper no-VI: - Contemporary Urban Issues

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contemporary problems of rural development

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and urban problems

B.A. part-II, Semester IV Paper no- VII -: Population in India Paper No-VIII: - Sociology
of Development

CO1: To understand causes, consequences of Indian population change.

CO2: Provides broad introduction to many development Issues in India

B.A. part-III Semester V paper: - Paper IX: Sociological Tradition Paper No. X: Introduction to Research Methodology Paper No. XII (Main) Urban Sociology

CO1: To provide the students with the basic understanding of emergence of sociological thought and to know about pioneer sociologists with their contributions to sociology

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B. A. part - III Semester VI Paper NoXIII. : Sociological Theories Paper No. XIV: Social
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CO2: Introduction to various steps in conducting research.

CO3: To analyze critically social problems of urban Indian and to discuss regarding impact of
modernization and industrialization upon the cities

M. A. Sociology M.A. part-I, Semester I Paper no-401: Theoretical Perspective in Sociology-1 Paper No-402-Methodology of Sociological Research Paper No- 421; Rural Society in India-1 Paper No 430; Contemporary Social Problems in India-1

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CO1: Introduction to the Theoretical concept of Sociology.
CO2: To impart knowledge to students regarding the fundamentals of methodology of social research.
CO3: A student if sociology must be aware about the changing scenario of Rural India and the
contemporary problems of rural development
CO4: To familiarze the students with the concept of social problems and theortical approaches
to understand them
M.A., Semester II, Paper no 403- Theoretical Perspective in Sociology 2 Paper No 404 – Methodology of Sociological Research and statistics Paper No 431- Rural Society in India 2
Paper No 440; Contemporary Social Problems in India-2
CO1: To introduces students some of the interactionist theory
CO2: To develop a critical outlook at the exiting perspective and methodsnand to evolve conceptual clarity which can lead them in thir future research
CO3: To understand basic characteristics nature of peasant society in India
CO4: To study various strategics programme and measures adopted in the modern socity to solve these problem
M.A. Part-II, Semester III Paper No-501: -Classical Sociological Tradition: Marx and Durkhim Paper no-502: - Sociology of Development Paper No- 521: Social Demography:
1 Paper No- 526: Criminology -1
CO1: To make the students understand the sociological theories of Karl Marx and Emile Durkhim
CO2: To provide an overview of the historical development process
CO3: To introduce the student to the popuiation groth in India and the world
CO4: To introduce the students subject of Criminology.
M.A. part-II, Semester IV Paper no-503 -: Classical Sociological Tradition: Weber, Pareto,
Cooley and Mead Paper No: -504 Development – An Indian Experience Paper No: -531: Social Demography 2 Paper No- 536: Criminology -2
CO1: To develop insight for understanding the later developments in sociological theory
CO2: To understand the contemporary socio - economic framwork of develompment in India
CO3: To make the students to understand the basic demographic concepts to develop their sociological knowledge.
CO4: To introduce the students subject of Criminology.

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COs : Political Science

B. A. Political Science Pol-101, Basic Concept of Political Science

CO1: To Know the Students Concept of State and Its origin, Nature & Elements.

CO2: To Study the Development of the Concept of Rights- State background of Political History.

CO3: To analyze transitions in societal systems the structure and order of the system.

CO4: To Enable Students to Understand Basic Concepts in Political Science.

Pol-102, Government and Politics of Maharashtra

CO1: To establish pattern of Maharashtra State.

CO2: To examine the government and non-government responses.

CO3: To History of the Freedom Movement in India Collected from the Bombay Government
Records.

CO4: To understand Historical and Political Background of Maharashtra.

CO5: To explain Structure and Functions of State Government in India.

CO6: To understand the Political Process of Maharashtra.

Pol-103, Basic Concept of Political Science

CO1: To defined terms in a social science outside of their immediate area of expertise, for example economist needing information regarding a political science term.

CO2: To create awareness among students about democracy.

CO3: To help the students to understand social and political values in indian political system.

CO4: To understand the concept of welfare state.

Pol-104, Government and Politics of Maharashtra

CO1: To contest elections to be a part of legislative and executive large parties came to be dependent upon smaller parties for the formation of government"s power.

CO2: To provide solution to social problems.

CO3: To help the students to know the

CO4: To study Panchayat raj History.

CO5: To orient the student about ideology and programme of political parties in maharashtra.

Pol-105, Indian Government and Politics

CO1: The government is to secure all round progress and prosperity of society.

CO2: The more important political events in recent government of India.

CO3: To understand basic principles of Indian constitution.

CO4: To study various constitutional institutional in India.

Pol-106 International Relations

CO1: To explain the behavior of individual entrepreneurs and firms rather than world politics,
liberalism contains a theory of international relations.

CO2: The study has important implications for international law and international relations generally.

CO3: To explain basic concepts in international relations.

CO4: To understand the stages of development of international relation as a separate discipline.

Semester - IV Pol-107, Indian Government and Politics

CO1: To explain structure of union government and budgetary process in India.

CO2: To understand the framework of Indian supreme court.

CO3: To explain about party system and electoral reforms.

CO4: To evaluate the federal structure and centre state relation.

Pol-108, International Relations

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CO1: To explore the nature of informal reasoning in international relations and to consider how
instruction could help enhance.
CO2: To study the various international and regional organization.
CO3: To aware about some major issues in internationalism.
CO4: Critically evaluate the non-alignment movement.

Semester V Pol - 109, Indian Political Thinkers

CO1: To understand modern political thinkers contribution.
CO2: It has been a problem in cultural transformation how best to accomplish the Cultural transformation of Indians into non-Indians.
CO3: To study the religious political, social and cultural thoughts of Indian political thinkers.

Pol - 110, Western Political Thinkers 33

CO1: To understand the views of western political thinkers.
CO2: To understand the ideas of western political thinkers and its relevance.
CO3: To understand the thoughts of Plato on various political concepts.
CO4: To know ideas of Aristotle and how he is father of political science.

Pol - 112, Indian Political Thinkers

CO1: To study Dr.B.R.Ambedkar"s thoughts on democracy, economy and society.
CO2: To CRitically evaluate M.N. Roy"s radical humanism.
CO3: To understand Nehru"s democratic and secular views and its applicability.
CO4: To know of ideas of Maulana Azad views on religion and politics.

Pol - 113, Western Political Thinkers

CO1: To present and thoroughly document the wealth of historical and institutional material.
CO2: To study the thoughts of J. S. Mill and its applicability.
CO3: Critically evaluate the thoughts of Karl Marx and its relevance.
CO4: To understand the theory of utilitarianism.

Pol – 111, Political Ideologies

CO1: To Study the development and features of the political ideologies.
CO2: To understand relevance of political ideology in contemporary period.
CO3: To show how these ideologies originated and how and why they have for most of the twentieth century, the clash of three political ideologies, liberalism, communism, and fascism.
CO4: To relate the theoretical discussion and analysis of ideologies to the transformations,

Pol - 114, Political Ideologies

CO1: To study of ideology of socialism.
CO2: Critically evaluate the ideology of fascism.
CO3: To study the development and features of the communism.
CO4: To explain the ideology of feminism.

M. A. Political Science PSC-401, Western Political Theory

CO1: To introduce Western political theory.
CO2: The meaning and nature of political theory, debates as well as recent theoretical trends in
the discipline.
CO3: To explain the philosophy, political theory and political ideology and uses of political theory.

PSC- 402, Theories of International Relations

CO1: This course aims of making the students understand changing nature of international relations in terms explain the traditional approaches as well as major scientific approaches.
CO2: To explain the theories of international relations.

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CO3: To understand the basic concepts of international relations.

PSC- 403, Comparative Politics: Theoretical Perspective

CO1: To the research process and ought to precede the other three objectives of comparison description and classification.

CO2: To help students of politics make such statements the best that Since the 1950s, political
scientists have increasingly sought to use comparative methods to help build.

CO3: To know the emergence of the new source of polities, comparative politics and comparative governments.

PSC- 432, State Politics in India

CO1: To introduce to the dynamics of state politics in India.

CO2: To focus on the study of the evolutionary nature of centre-state relationship in the country
after independence.

CO3: To assist students to know elections and political parties, changing nature of political process in states.

PSC- 404, Modern Political Ideologies

CO1: The ideas serve as the foundation of political system.

CO2: This course is an attempt of teaching student"s world"s great ideas which are broadly considered as political creeds usually termed political ideologies: liberalism,
conservatism, socialism, Marxism etc.

CO3: Orient student about political ideology and development.

PSC- 405, World Politics: Issues and Debates

CO1: To introduce students the critical analysis of new trends in the field of world politics.

CO2: To create awareness about important issues in contemporary world politics.

CO3: To explain the cold war and its impact on world politics.

PSC- 406, Western Political Thought

CO1: Political thoughts occupy central position in the knowledge mechanism of political science, without which students are incapable.

CO2: To understand the theory debate and unable to make an inquiry into the socio-political problems. It is, therefore, necessary to generate their thinking by appearing this course.

CO3: To understand the views of western political thinkers on various political concepts.

PSC- 435, Public Administration

CO1: To acquaint the students with the concept of public administration.

CO2: Its theories, management and organization and to imbibe its significance as a growing discipline in all walks life.

CO3: To understand the basic concepts of public administration approaches and new public administration.

PSC- 407, Research Methods in Social Sciences

CO1: To acquaint the student with the basic concepts of research and to familiarize.

CO2: To understand the latest & scientific techniques and modern trends in social research.

CO3: To understand the major study in the research process concepts variables and hypothesis.

PSC- 408, Indian Political Thought

CO1: The precise aim of the ant colonial movement in India was to institute citizenship and to
put in place a constitutionality that was derived not from colonial authority but from a constituent.

CO2: To set the evidence out fairly, interpret it strictly, and alert readers to their political aims

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were moderate, but pursued with a steady bureaucratic passion: they were driven far more the desire to achieve things than by the desire, common enough in politics.
CO3: To evaluate the British impact on Indian society, the theoretical perspective of social reforms movements in 19th century social vs political reforms.

PSC- 409, India's Foreign Policy

CO1: To understand basic approaches in the study of foreign policy.
CO2: To explain elements in the making of foreign policy and particularly focus on the changing nature of India"s foreign policy.
CO3: To know the basic approaches to the study of foreign policy.

PSC- 437, Modern Trends in Political Theory

CO1: To provide an overview of the current trends in political theory.
CO2: To throw an insight into the divergent trends in modern political theory.
CO3: To study the import ants of social justice, theory of rights, feminist political theory.

PSC- 410, Constitutional process in India

CO1: To understand the constitution - various provisions, rights and duties.
CO2: The dignity of every citizen the emphasis is on secular values, liberty, equality, justice and brotherhood.
CO3: To know the framing of the Indian constitution background and working of the constituent assembly and philosophy of constitution.

PSC- 411, Political analysis

CO1: To deal with key issues related to political theory.
CO2: To familiarize the students with the ever on-going debate on the concepts like liberty, equality and a just social order from Liberal and Marxist perspectives.
CO3: To focus on modern analytical trends that claim to break a new ground in the study of political theory.

PSC- 412, South Asia and the world

CO1: To understand the challenges of a global job market.
CO2: To focus on micro study of South Asian region.
CO3: To specialize the students on South Asian study.

PSC- 423, Dr. Babasaheb Ambedkar on Caste: A study of his text annihilation of caste

CO1: Indian caste ridden society has created unprecedented socio-political problems within the
frame work of parliamentary system.
CO2: Impact the caste system has constituted major retard the developmental process of Indian
democracy. With this reference the course offers caste debate of Dr. B. R. Ambedkar so as to get introduce the student over the problem of caste.
CO3: To explain Dr.Ambedkar"s theories, vision of ideal society, social vs politial reforsms, annihilation of caste.

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COs : Psychology

Psychology B.A. I year

PSY 101 General Psychology

CO1: To provide solid foundation for the basic principles of psychology.

CO2: To familiarize students with the historical trends in psychology, major concepts, theoretical perspectives, empirical findings.

CO3: To provide an overview of the applications of psychology.

PSY 102 Social Psychology

CO1: To enable student to appreciate how individual behaviour is influenced by social and cultural contexts.

CO2: To enable student to develop an understanding of functioning of dyads, groups and organization.

CO3: To understand the unique features of the Indian socio-cultural context.

CO4: To understand how social problems can be analyzed in terms of various social psychological theories.

PSY 104 Basic Concepts in Psychology

CO1: To provide solid foundation for the basic principles of psychology.

CO2: To familiarized students with the historical trends in psychology, major concepts, theoretical perspectives, empirical findings.

CO3: To provide an overview of the applications of psychology.

PSY 105 Basic Concepts in Social Psychology

CO1: To enable student to appreciate how individual behaviour is influenced by social and cultural contexts.

CO2: To enable student to develop an understanding of functioning of dyads, groups and organization.

CO3: To understand the unique features of the Indian socio-cultural context.

CO4: To understand how social problems can be analyzed in terms of various social psychological theories.

PSY -103 106 Psychology Practicum's: Experiments & Test:

CO1: To nurture the skill of observation.

CO2: To create interest in psychological phenomenon.

CO3: To develop awareness of psychological tools, techniques and tests.

B.A. II year PSY 110 Psychology for Living:

CO1: To enable student to make the connection between psychology and its practical application to everyday life.

CO2: To train student how psychological principles can help them to face life"s challenges

CO3: To enables students to relate what they are learning in class to issues that they encounter
in their everyday life, such as stress, health, work, personal relationships communication and self-esteem.

PSY 111 Psychological Statistics:

CO1: To train students in various psychological assessment techniques.

CO2: To acquaint the student and make them understand the different statistical methods with
their uses and interpretations.

CO3: To impart skills necessary for selecting and applying different tests for different purpose
such as evaluation, training, rehabilitation etc.

CO4: To nurture the skill of observation.

PSY 107 Psychology of Adjustment:

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CO1: To enable student to make the connection between psychology and its practical application to everyday life.
CO2: To train student how psychological principles can help them to face life"s challenges.
CO3: To enables students to relate what they are learning in class to issues that they encounter
in their everyday life, such as stress, health, work, personal relationships, communication and self-esteem.

PSY 108 Psychological Testing:
CO1: To train students in various psychological assessment techniques.
CO2: To acquaint the student and make them understand the different statistical methods with
their uses and interpretations.
CO3: To impart skills necessary for selecting and applying different tests for different.

B.A. III year PSY 113 Subsidiary Abnormal Psychology
CO1: Critical Thinking
CO2: Effective Communication
CO3: Community and Civic Responsibility
CO4: Quantitative Literacy
CO5: Scientific and Technological Effectiveness

PSY 114 Organizational Psychology
CO1: This course aims and understanding the behaviour of individuals along with other organizational assets
CO2: Students are expected to learn not only the theoretical aspects of the course but also to familiarize themselves with the skills, techniques and their application

PSY 119 Subsidiary Psychopathology:
CO1: To impart knowledge about the normality and Abnormality.
CO2: To make students understand the nature and Course of various abnormal conditions.
CO3: To impart knowledge and skills needed for Psychological assessment of different abnormal conditions.
CO4: To impart Knowledge and skills needed for Psychological assessment of different abnormal conditions.

PSY 117-123 Project Work.
CO1: Students should able to write a project in psychology.
CO2: Students should acquire the skills of presentation –PPT PSY 115 & 121
CO3: To nurture the skill of observation.

PSY 122 Main counselling in action
CO1: To impart Knowledge about the counselling
CO2: To make students understand the nature and Course of various conditions in which counselling is needed.
CO3: To impart Knowledge and skills needed for Psychological assessment of different counselling conditions conditions.

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COs : History

B. A. History Shivaji and His Times (1630-1818)

CO1: Introduce innovative study techniques in the study of History of Maratha to make it Value based, conceptual and thought provocative. The secular ruler was very accommodating of all religions. He had numerous Muslim soldiers in his army. His only aim was to overthrow Mughal rule and establish Maratha Empire. He was also very supportive of people who converted to Hinduism.
CO2: Introduce international elements in the study of Marathas to facilitate comparative analysis of this history.
CO3: Highlight the importance of past in exploration of present context.
CO4: Understand the socio-economic, cultural and political background of 17th century Maharashtra.
CO5: Increase the spirit of healthy Nationalism & Secularism among the student.

History of Modern Maharashtra (1818-1960)
CO1: To give the student an introduction to the study of Maharashtra.
CO2: To acquaint the student with the basis understanding of how Maharashtra has grown to the present position and how the state has reached the present day.
CO3: To impart high quality of education to the students.
CO4: To prepare the students for a variety of challenging careers through innovation in teaching and research.
CO5: To develop comprehensive understanding of interdisciplinary issues of the society.

History of Early India (up to B.C. 300)
CO1: The study of ancient Indian history is important to those who want to understand the true nature of many races and tribes intermingled in early India.
CO2: Ancient India also saw the birth of Brahmanism of Hinduism, Jainism, and Buddhism, but all these cultures and religious intermingled and interacted.
CO3: Increase the spirit of healthy nationalism & secularism among the student.
CO4: The study of ancient Indian history is important to those who want to understand the true nature of the past and also to those who seek to understand the nature of the obstacles thatimpede India's progress as a nation.

History General Paper-VIII History of Mughal India (A.D. 1526- A.D. 1757)
CO1: To study the Mughal contribution to the Indian subcontinent.
CO2: The study of Mughal period would see a more fruitful blending of Indian, Iranian and Central Asian artistic, intellectual and literary traditions than any other in India's history.
CO3: To study Persian art and culture amalgamated with native Indian art and culture.
CO4: To study the political unity provided by the Mughal rulers.

History General Paper – IX Historiography
CO1: The study of development of history as a discipline.
CO2: The study of the writing of historical accounts.
CO3: Indicate the importance of thinking "historiographically" as well as historically.
CO4: To provide new angles to research and new interpretations to dispute.

History General Paper-X History of Indian national Movement (A.D. 1885-A.D. 1947)
CO1: To provide a comprehensive understanding of the transformations in the economy of colonial India.
CO2: to introduce land and agrarian policies under the British rule.
CO3: To develop nationalism in student mind.
CO4: To understand the British economic policy and why Indian revolted.
CO5: To understand all the Government and British parliamentary acts that led to the

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B. Com

COs POs

PSOs

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Programme Outcomes -B. Com.

PO01: Management skills: The programme can provide administrative abilities for providing trained professionals for banking, industrial and financial institutions.

PO02: Problem analysis: An intensive knowledge of accountancy, business law, economic principles, and taxation to complex commercial problems can be achieved.

PO03: Professional ethics: After completion of B.Com, B.Com graduate can work as a- Accountant, Auditor, Consultant, Company Secretary, Business Analyst, Finance Officer, Sales Analyst, Junior Analyst, Tax Accountant, Stock Broker, Economist, Business Development Trainee.

PO04: Professional skills: A student can also opt for LLB after B.Com. Business Law is one of the best options in it.

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COs : B. Com

B.Com First Year, Semester II (CBCS Pattern) Financial Accosting II (Paper–III) CO1: To provide knowledge of basic accounting concepts, accounting standards and accounting principles the aim is also to provide the practical accounting knowledge.

CO2: To enable the students about depreciation and royalty account.

CO3: To make an ability to understand accounts of non trading concern and branch accounts.

CO4: To enrich students in financial accounting

CO5: To enhance the ability to solve practical sums of departmental accounts and consignment accounting.

Business Mathematics and Statistics II (Paper–IV)

CO1: To make students learn and understand the concept of Co-relation.

CO2: Student is expected to have knowledge of the types and methods of estimating regression lines.

CO3: This course provides Knowledge about Index Numbers, its types and uses.

CO4: To understand the procedure of application of Probability.

CO5: This Course provides knowledge & ability among students for using statistical tools with Computer.

Business Organization and Management (Paper –V)

CO1: To make students learn and understand the foundation of Indian Business & emerging opportunities in Business.

CO2: Student is expected to have knowledge of the forms of organization.

CO3: This course provides Knowledge about process of Management & Organization.

CO4: To understand the procedure of Leadership, Motivation & Control. **CO5:** This Course provides knowledge of functional areas of management.

Business Communication (Paper–VI)

CO1: To make students learn and understand Business communication.

CO2: Student is expected to have knowledge about the Business correspondence i.e. letter writing, preparing the resume and job application letter.

CO3: This course provides Knowledge about report writing.

CO4: To understand the procedure of oral presentation.

CO5: This Course provides knowledge & ability among students

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for modern forms of communicating.

Optional Group Entrepreneurship Development (Paper-VII)

CO1: To make students learn and understand the role of Entrepreneurship in Economic Development.

CO2: Student is expected to have knowledge of the emerging trends in Entrepreneurship Development

CO3: This course provides Knowledge about Project identification and Resource Management.

CO4: To understand the procedure of Entrepreneurship Development Program.

CO5: This Course provides knowledge for students how to Selection, Preparation & what are the requirement for the project.

Office Management (Paper–VII)

CO1: To make students learn and understand the Modern office & its Functions

CO2: Student is expected to have knowledge about office system and role of manager in system

CO3: This course provides Knowledge about office services.

CO4: To understand the procedure of record management and reporting.

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CO5: This Course provides knowledge for EDP Environment for effective office management.

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B.Com. S. Y. III Semester III (CBCS Pattern) Corporate Account-I (Paper -III)

CO1: To create awareness about Corporate Accounting in conformity with the provisions of Companies Act and as per Indian Accounting Standards.

CO2: To make aware about the conceptual aspect of corporate accounting. **CO3:** To acquaint about issue and forfeiture of shares with re-issue procedure. **CO4:** To make practice the final account of Joint Stock Company.

CO5: To enable students to acquire the knowledge of redemption of debentures and preference shares.

CO6: To understand the knowledge of profit prior to incorporation.

Cost Account-I (Paper -IV)

CO1: To create ability of students to understand basic cost accounting concepts and the classification of cost.

CO2: To provide the knowledge of material handling methods such as LIFO, FIFO, simple average and weighted average.

CO3: To explain the labor costing methods like incentive scheme, wage payment, time and piece rate etc.

CO4: Awareness will be received about costing methods and techniques.

CO5: To develop overheads knowledge and its methods of distribution.

I.T. Application in Business I (Paper -V)

CO1: To aware about C-Language and relevant software.

CO2: To acquaint the student about importance of operators in C and use of computer for it.

CO3: To enhance the knowledge of control benchmarking and decision making in C.

CO4: To guide students about loop and its type.

CO5: To make practice arrays and strings.

CO6: To encourage students to learn practical application of C-Language.

GST Account-I (Paper -VI)

CO1: Creating ability of students to learn tax concepts, procedure and legislation pertaining to GST in India.

CO2: To make perfection in learning of GST Registration process.

CO3: To understand practical online GST registration process and

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filling GST returns.

CO4: To provide knowledge of supply under GST and valuation of supply.

CO5: Ability of student is to be existed to learn input tax credit.

CO6: Understand GST accounting with their documentation and keeping process of records in GST.

Financial Management-(Paper -VII)

CO1: To enhance financial literacy of students.

CO2: To make aware students about financial planning and financial sources.

CO3: To analyses budgeting and learned different methods or techniques of capital structure.

CO4: To acquaint about working capital management of a firm and its importance.

CO5: To learn how to analyze leverages.

CO6: To enlighten students regarding the dividend policy and decision making in finance.

Indian Economy (Paper -VII)

CO1: To orient the students about the recent trends in Indian Economy.

CO2: To create awareness about economic reforms in India since 1991.

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CO3: To inculcate knowledge of various aspects of Indian Economy through practical approach like calculation of GDP, national income etc.

CO4: To provide detail information of causes, effects and government measures to reduce unemployment in India.

CO5: To acquaint the knowledge of five years plans and budget.

B.Com. T.Y. Old Pattern (Semester V and VI) Advanced Financial Accounting-I (Paper No. XXIX) and Advanced Financial Accounting-II (Paper No. XXXV)

CO1: To equip the students with the ability to analyze, Interpret and use financial account in business enterprise.

CO2: To introduce stock market, Electricity Company, insolvency accounts accounts of local government and farm accounting.

CO3: To provide the knowledge of social accounting, departmental accounting, investment accounting, bank final account and accounts of insurance companies.

Management Accounting-I (XXX) and Management Accounting-II (XXXVI)

CO1: To equip the students with the ability to analyze interpret accounting information in managerial decision making.

CO2: To have a good working knowledge of the subject.

CO3: To understand the application of management accounting techniques. **CO4:** To provide the knowledge of budgeting and responsibility accounting. **Cost Accounting-I (XXXI) and Cost Accounting-II (XXXVII)**

CO1: To expose the students to the basic concepts and the tools used in cost accounting.

CO2: To provide the knowledge about Single and output costing.

CO3: To explain the different accounting methods such as contract costing, operating costing and process costing.

Indirect Taxes and Direct Taxes-I (XXXII) and Indirect Taxes and Direct Taxes-II (XXXVIII)

CO1: To expose students to the basic tax concepts, procedure and legislation pertaining to indirect tax.

CO2: To provide the basic of Income tax act 1961.

CO3: To understand practical knowledge of income for salary and business and profession.

CO4: To provide knowledge to student of all direct sources of income tax. **New Auditing Trends-I (XXXIII) and New Auditing Trends-II (XXXIX) CO1:** To understand about the auditing procedure.

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CO2: To enable the students to understand the auditing concepts and new auditing trends. **CO3:** To explore the knowledge Cost and Management Audit, Human Resource Audit, Investigation, Trends in Cooperative Audit and Tax Audit are explained throughout the subject work.

Optional Group Banking and Insurance-I (XXXIV) and Banking and Insurance-II (XXXX)

CO1: To familiarize student with banking and practices of banking.
CO2: To equip the students with the knowledge of modern banking.
CO3: To develop employability of student in banking, financial and other economic sector.
CO4: This course enables the students to know Fundamental of Insurance. **Information and Communication Technology-I (XXXIV) and Information and Communication Technology-II (XXXX)**

CO1: To familiarize the students with the programming in C environment.

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CO2: To familiarize the student with all the latest new age system prevalent in business Domain.
CO3: To Provide the knowledge of E-banking, Security in e-banking, ERP, BPO and Knowledge Management.

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B.Sc

COs POs

PSOs

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Program Outcomes - B. Sc.

PO1: Scientific temperament: It inculcates scientific attitude in the minds of learners in physical, chemical, material, life and mathematical sciences. Students acquire scientific abilities like logical thinking, problem solving approach, data collection and decision making.

PO2: Basic scientific knowledge: Students acquire scientific knowledge to extract information, formulate and solve problems in systematic manner.

PO3: Technical competence and practical skills: The learners acquire skills to handle basic scientific instruments following the general lab safety practices through experimental skills

PO4: Creative thinking and numerical ability: It empowers the learners with creative thinking and numerical ability.

PO5: Environment and sustainability: It provides understanding of current scenario and necessity of sustainability along with solutions. Students are made aware of environment related issues and sustainable technology development.

PO5: Competency: The program prepares learners for post-graduation and highereducation. Students get eligible for appearing to the competitive exams such as MPSC and banking sectors.

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Program Outcomes – M. Sc.

PO1: Scientific knowledge: Leaners acquire scientific knowledge. Students acquire ability to integrate and in-depth knowledge in the concerned subject. The program gives the interdisciplinary applications of the respective subject.

PO2: Problem analysis and analytical thinking: Learners can identify, formulate, review research literature, formulate research problem, and analyze them and derive conclusions. Learner can develops ability to formulate research problem using the basic principles of mathematical, biological, physical and chemical sciences.

PO3: Research skills: Students can acquire research skills through project works whichare the foundations of research.

PO4: Basic instrumentation handling: Learners acquire skills of handling basic instrumentation skills.

PO5: Design / development of solutions: Learners can design solutions for scientific problems through practical based experiential learning for cultural, societal, and environmental considerations.

PO6: Development: Learners can acquire knowledge independently for personal and professional development.

PO7: Research Aptitude: Basic orientations of students towards research methodology and project work.

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COs: Mathematics

B. Sc.- Mathematics Differential Equations

CO1: To understand the homogeneous and separable first order differential equations.

CO2: To understand the exact differential equations.

CO3: To understand homogenous linear equation with constant coefficient and variable coefficient

CO4: To find the solution of non-homogenous first order differential equations.

CO5: To find the solution of Bernoulli"s equation.

Geometry

CO1: To understand geometrical terminology for plane, right line, sphere, cylinder and cone.

CO2: To know the geometrical results to find centre and radius of the circle.

CO3: Students find equation of lines and planes in space.

CO4: Student will be able to find angle between two planes and to find length of perpendicular

from a given point to a given line.

CO5: Students are able to identify parallel and perpendicular lines.

Differential and Integral Calculus

CO1: Students develop the concepts of limit, function, continuity, discontinuity and derivative.

CO2: Students become familiar with hyperbolic functions, inverse hyperbolic functions, derivatives, and higher order differentiation.

CO3: Students understand the consequences of Rolle"s Theorem and mean value theorem for differentiable function.

CO4: Student understands definite integral as the limit of a sum.

CO5: Student will be able to understand the concept of divergence, curl, gradient and it"s applications.

Number Theory

CO1: Students are able to find quotient and remainders from integer division.

CO2: Students apply Euclid"s algorithm and Backward substitutions.

CO3: Students understand the concept of Congruences, residue classes and least residue.

CO4: Student knows the concepts addition and multiplication of integers modulo n.

CO5: Students are able to solve linear congruences.

Numerical Methods.

CO1: Student becomes familiar with numerical solutions of nonlinear equations in a single variable.

CO2: Students know the concepts numerical interpolation and approximation of functions

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CO3: Student solve first order initial value problem using Euler"s method.

CO4: Student solve first order initial value problem using a second order Runge- Kutta Method.

CO5: Students are able to find numerical solution of ordinary differential equations.

Integral Transform and Partial differential Equations

CO1: Students understand the concept of beta and gamma function and its application.

CO2: Students are able use to Laplace transform to solve ordinary and partial differentialequation.

CO3: Students apply the properties of Laplace Transform to solve examples.

CO4: Students know the difference between linear and nonlinear partial differential equations.

CO5: Student able to solve the linear and nonlinear partial differential equation by various methods like Lagrange"s, Charpit"s, Jacobi"s, Monge"s Method.

Mechanics (I & II)

CO1: Students understand the concepts particle, rigid body, force, equilibrium etc.

CO2: Students can find the components of velocity and acceleration in a given direction.

CO3: Students follow the concepts momentum, angular momentum, work, energy and pointsfunctions in mechanics.

CO4: Students know what is projectile and motion of projectile.

CO5: Students know the differential and pedal equations of central orbits and their applications

Abstract Algebra (I & II)

CO1: Students understand the number systems and algebraic structures.

CO2: Students understand the concept Ring and special types of Rings.

CO3: Students identify the difference between homomorphism and isomorphism of a group.

CO4: Students know and apply the concepts of linear dependence and linear independence ofvectors.

CO5: Students are able to give the examples of inner product space.

Ordinary Differential Equations (I & II)

CO1: Students know the difference between equation and differential equation.

CO2: Students are able to find the solution of linear differential equation of first and second order.

CO3: Students understand the initial value problem and its solutions.

CO4: Students know the concept Wronskian of solution.

CO5: Students can find singular point and regular singular point of the differential equation.

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Real Analysis (I & II)

CO1: Students become familiar with terminology sets, elements, operations on sets, functions,

operations on functions.

CO2: Students are able to define and recognize the basic properties of the field of real numbers.

CO3: Students are able to understand the concept of series of real numbers, convergence and Divergence.

CO4: Students are able to understand the definition of Metric Space and continuous function on

metric space and difference between open sets and closed sets.

CO5: Students are able to define Riemann integral and its properties and also Fourier series and

its application**M. Sc. Mathematics M.Sc. F. Y. (Mathematics) Abstract Algebra I & IICO1:** Students solve a wide variety of problems based on Sylow theorems.

CO2: Students understand fundamental theorem of finitely generated Abelian group.

CO3: Students find order of a group and an element.

CO4: Students evaluate basis and dimension of vector spaces.

CO5: Students understand Galois Theory.

Real Analysis I & II

CO1: Students know the extension of a measure.

CO2: Students use technology tools to solve the problems of Riemann and Lebesgue integrals.

CO3: Students demonstrate the ability to apply analytical and theoretical skills to model and solve the problems based on measure spaces.

CO4: Students understand how to find the Four Derivatives

CO5: Students solve the examples on the general integral.

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Topology (I & II)

CO1: Students know the difference between open and closed sets on different topological spaces.

CO2: Students know the two Fundamental topologies, i.e. Indiscrete and Discrete topologies.

CO3: Students can understand when two topological spaces are Homeomorphic.

CO4: Students identify the concept of connectedness, compactness and Separation axioms.

CO5: Students understand concepts of Bases, Sub-bases, Nets, Filters and Ultrafilter.

Complex Analysis I & II

CO1: Students know the basic concept of complex numbers.

CO2: Students follow the concept of metric spaces and topology with respect to complex plane.

CO3: Students learnt the topics of Power series, Cauchy-Riemann equations and harmonic functions.

CO4: The student understands complex integration.

CO5: Students learnt the functions like Gamma function, Riemann Zeta function together with

Weistrass factorization theorem.

Differential Equations (I & II)

CO1: Students understand Linearly Dependence or Independence of functions by using the Wronskian of the functions.

CO2: Students are able to solve Simple Harmonic Motion Problems and Damped Motions problems.

CO3: Students understand the concept of Existence and Uniqueness of solutions.

CO4: Students are able to solve the Initial value problems and Boundary value problems.

CO5: Students recall the concept of Maximum and Minimum Principle.

Functional Analysis

CO1: Students unify many principles learned at earlier stages of Real-Analysis.

CO2: Students understand reflexivity of a Hilbert Space.

CO3: Students are able to learn projection and self-adjoint operators.

CO4: Students define inner-product spaces and solve the problems based on it.

CO5: Students know normed linear spaces and Banach spaces.

Partial Differential Equations

CO1: Students are able to classify whether the second order Partial differential equation is Elliptic, Hyperbolic or Parabolic.

CO2: Students understand the concept of four fundamental equations. i.e. Laplace Equations, Transport Equations, Heat equations and wave equation.

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CO3: Students understand Mean value theorems, Green"s Theorem and poison"s Equation.

CO4: Students can find solution of Heat equation and Wave equation.

CO5: Students know the Burger Equation.

Numerical analysis

CO1: Students can apply the Numerical Methods. i.e. Bisection, False position, Newton-Raphson to solve nonlinear equations.

CO2: Students are able to find the Errors and the Rates of Convergence.

CO3: Students recognize Iterative methods i.e. Jacobi- Gauss seidel methods.

CO4: Students know the Numerical Differentiation and Numerical Integration.

CO5: Students can apply the interpolation methods for solving the problems numerically.

CO6: Mechanics Students know the concepts of generalized co-ordinates and generalized momentum.

CO7: Students are able to solve the problems on functional

CO8: Students understand the planar and spatial motion of a rigid body.

CO9: Students understand the motion of a mechanical system using Lagrange- Hamiltonian Formulae.

CO10: Students are able to find the Isoperimetric problems and Geodesic.

Fuzzy Mathematics

CO1: Students know the concepts of Crips set and Fuzzy set theory.

CO2: Students understand the methods of fuzzy logic.

CO3: Students can recognize Fuzzy logic membership function.

CO4: Students know the concepts of alpha- cuts and strong alpha- cuts.

CO5: Students understand the first and second characterization theorems.**Linear Integral Equations**

CO1: Students find the solutions to Initial Value Problems and Boundary Value Problems.

CO2: Students can distinguish between pointwise and uniform convergence.

CO3: Students find the derivatives of higher order.

CO4: Students can recall Laplace and Fourier transforms learned at graduation.

CO5: Students identify whether the given kernel is symmetric or seperable kernel.**Fluid Mechanics I & II**

CO1: Students know the types of fluids and Euler"s equation, equation of continuity and Bernoulli"s equation.

CO2: Students understand the sources and sink.

CO3: Students learn Blasius and Milne Thomson circle theorem.

CO4: Students studied viscous flows.

CO5: Students learn Navier-Stokes equations and its applications.

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Operation Research I & II

CO1: Students learn simplex method.

CO2: Students can solve transportation and assignment problems.

CO3: Students understand Game theory.

CO4: Students understand the sequencing problems of different types.

CO5: Students are able to learn non-linear programming problems.

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COs: Microbiology

B.Sc. Microbiology B. Sc. I year- Semester I Paper I. Fundamentals of Microbiology

CO1: To familiarize the students with the basic concepts related with viruses and prokaryoticcells.

CO2: To understand the concepts of microbiology.

CO3: To study molecular and structural unity of microbial life.

B. Sc. I year - Semester I Paper II. Microbiological Techniques and General MicrobiologyCO1: To understand different microbes do not play an important role.

CO2: To exploit the useful microorganisms and control the harmful ones.

CO3: To isolate microorganisms in pure form, understand the significance of pure culture.

CO4: To grasp the methods of cultivation and preservation of microbial cultures.

CO5: To understand and use methods of visualizing microorganisms and practical aspects ofsterilizing techniques.

B. Sc. I year- Semester II Paper V. Cytology and General Microbiology

CO1: To identify and describe the parts of a bacterial cell and state the function of eachbacterial cell structure.

CO2: To describe the types of nutrients that is used by microorganisms for growth andmetabolism.

B. Sc. I year- Semester II Paper VI. Basic BiochemistryCO1: To study microorganisms

CO2: To understand the basic concepts of biochemistry in detail carbohydrates, lipids, proteins, nucleic acids, pH and buffers.

B.Sc. II year- Semester III Paper VII. Environmental Microbiology.

CO1: To understand the significance of air pollution, air sanitation, air as carrier of microorganism and significance of air flora in human health, hospitals and industries.**CO2:** To study the determination of sanitary quality of water.

CO3: To understand the importance of indicators of fecal pollution, ways to sanitize potablewater.

CO4: To understand sewage treatment and disposal.

B.Sc. II year- Semester III Paper VIII. Immunology

CO1: To study the significance of normal flora, normal defensive mechanism of host, virulencefactors of microorganisms and process of infection.

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CO2: To understand the various types of immunity and their mechanism, general methods ofprophylaxis.

CO3: To grasp the immunological concepts with reference to antigens, antibody andantigenantibody

reaction.

Paper XI. Applied Microbiology.

CO1: To know the composition of milk, sources of microorganisms in milk, desirable and undesirable changes brought by microorganisms in milk, diseases spread by milk, microbiological examination of milk. Sterilization and pasteurization of milk.

CO2: To understand the groups of microorganisms in food, principles of food preservation, microbial spoilage of canned and non- canned foods, food borne diseases and

intoxication, fermented foods and probiotics.

B.Sc. II year- Semester IV Paper XII. Clinical Microbiology.

CO1: To understand concepts in etiology, pathogenesis laboratory diagnosis, epidemiology,

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prophylaxis and chemotherapy of few human diseases caused by bacteria, viruses, fungusand protozoa.

CO2: To study diseases they study are tuberculosis, syphilis, malaria, typhus fever, candidiasis, typhoid, and cholera, infection caused by Staphylococcus aureus, Streptococcus pneumoniae, HIV, Hepatitis virus, and oncogenic viruses.

B.Sc. III year- Semester V Paper XV. Microbial Genetics

CO1: To understand and apply the principles and techniques of molecular biology which prepares students for further education and employment in teaching, basic research, or thehealth professions.

CO2: To study core molecular genetics concepts including molecular biology, genetics, cellbiology, physiology.

B. Sc. III year- Semester V Paper XVI. Microbial Metabolism.

CO1: To acquaint with the basic concepts of metabolism and free energy.

CO2: To introduce the various types of energy yielding metabolism, comparative account offermentation, respiration and photosynthesis.

CO3: To aware the students of the various pathways of carbohydrate fermentation.

CO4: To familiarize students with basic concept of enzyme action, classification of enzymesand enzyme inhibition.

CO5: To understand the aspects of aerobic respiration, biosynthesis of nucleotides andcatabolism of unsaturated fatty acids and nucleic acids.

B.Sc. III year- Semester VI Paper XIX. Recombinant DNA technology

CO1: To understand core molecular genetics concepts including molecular biology, genetics, cell biology, physiology.

CO2: To demonstrate working knowledge in a defined skill set of molecular biology andbiotechnology protocols including PCR, Plasmid isolation, gene isolation and cloning, DNA sequencing.

B. Sc. III year- Semester VI Paper XX. Industrial Microbiology.

CO1: To acquaint with historical events in Industrial microbiology, design of a fermentor, IPand W.H.O. standards of sterility.

CO2: To familiarize with screening methods, preservation of industrial strain, strain improvement methods, inoculum and fermentation medium development.

CO3: To make aware of different typical fermentations like penicillin, vitamin B12, L-Lysin, ethyl alcohol, citric acid, amylase, Baker"s yeast.

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COs: Botany

B. Sc. Botany Diversity of Cryptogams-I

CO1: Introduction about basic plant group like Algae and Fungi.

CO2: To equip the students with all life science fundamental practical skills.

CO3: Make aware about the economic and medicinal value of cryptogrammic plant.

Morphology of Angiosperms

CO1: Introduction about basic structure of plants.

CO2: To develop practical knowledge of Angiosperm plants

Diversity of Cryptogams-II

CO1: To understand the various category of plants with morphological features of Bryophytes and Pteridophytes.

CO2: Analyze the peculiar characteristics features of plant groups in relation with its internal characteristics.

CO3: Make aware of economic and medicinal value of cryptogrammic plant.

Histology, Anatomy and Embryology

CO1: To get detail knowledge of internal structure of plant parts

CO2: To use this knowledge in Wood Industry, Forensic science.

CO3: To understand development of seed and seed certification.

Taxonomy of Angiosperm

CO1: Familiarize with basic terminology, plant systematic and its different classification.

CO2: To identify Angiosperm plants and their use.

Plant Ecology

CO1: Knowledge of anatomical characterization of plant for the understanding ecological adaptation.

CO2: Study its eco-friendly conservation and sustainable utilization.

CO3: Students cop up with the ecosystem mechanism, analyzing plants ecosystem.

Gymnosperms and Utilization of plants

CO1: To make aware about the economic and medicinal value of Gymnosperms and Angiosperms.

CO2: To understand some important terminology in industrial economically important higher plant groups species.

Plant Physiology

CO1: To understand plant physiology, different life process, streams like Plant genetics and

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Plant biotechnology.

CO2: To use the knowledge for advance study in plant sciences.

Cell and Molecular Biology

CO1: To create the innovative approaches to aware the students in basic terminology of plant cell

CO2: To get the detailed knowledge of cell at molecular level.

CO3: To apply this information for development of humankind

Diversity of Angiosperms-I

CO1: Create awareness about the plant resources

CO2: To classify plants on the basis of various morphological aspects

CO3: Participate in laboratory experiments for understanding the basic principles of life sciences and helpful for gaining primary information.

Genetics and Biotechnology

CO1: To Study basic terms in Mendelian and Non mendelian genetics

CO2: To focus on Biotechnological importance for improvement and satisfaction of all need of human kinds

CO3: To give basic information regarding the plant biotechnology and its application in agriculture, Horticulture, medicinal and industrial crops.

Diversity of Angiosperms-II

CO1: To study its eco-friendly conservation and sustainable utilization of plants

CO2: Knowledge about flora in the area.

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COs: Chemistry

B. Sc. Chemistry Paper I Inorganic Chemistry

CO1: To study the basics of atomic structure - atomic orbitals, Quantum numbers, Heisenberg uncertainty, Aufbau and Pauli exclusion principles, Hund's multiplicity rule. Electronic configurations of the elements, Bohr's atomic model.

CO2: To understand some periodic properties - atomic and ionic radii, ionization energy, electron affinity and electro negativity with reference to trends in periodic table and application in predicting chemical behavior.

CO3: To study s and p- block elements.

Paper No. II Organic Chemistry

CO1: To understand basic concepts in organic chemistry- reactions, reagents and mechanisms of organic reactions.

CO2: To study stereochemistry and its importance.

CO3: To familiarize open chain compounds like alkanes, alkenes and aromatic compounds chemistry and their importance.

Paper V Physical Chemistry

CO1: To understand basic mathematical concepts - logarithmic relations, curve sketching, linear graphs and calculation of slopes, differentiation of functions simple mathematical functions, maxima and minima, partial differentiation.

CO2: To understand kinetic theory of gases, kinetic gas equation, and gas laws - Boyles Law, Charles Law, Grahams Law of diffusion, Avogadro's hypothesis, deviation from ideal behavior, van der Waals equation of state.

CO3: Critical Phenomena: PV isotherms of real gases.

CO4: To study chemical kinetics: Factors influencing the rate of reaction, rate law and characteristics of simple chemical reactions - zero order, first order, second order, Pseudoorder, half life. Arrhenius equation, concept of activation energy. Catalysis: Definition, types, and characteristics, Enzyme catalysis.

CO5: To understand basics of liquid and solid state - Intermolecular forces, structures, liquid crystals: Classification, structure of nematic and cholesteric phases.

CO6: To study solids, Miller Indices, laws of crystallography, X-ray diffraction by crystals. Derivation of Bragg equation.

CO7: To familiarize with colloidal state.

Paper VI Inorganic Chemistry - II

CO1: To understand chemical properties of the noble gases, chemistry of xenon, structure and

bonding in xenon compounds.

CO2: To understand types of bonds- ionic, covalent and coordinate, Hydrogen bonding, Vander-

Waals forces, Metallic bond Therories of bonding - VBT, VSEPR, MOT with formation and shapes of molecules.

CO3: To understand the basics of nuclear chemistry - Isotopes, Isobars mass, Binding Energy,

Packing fraction N/Z ratio, Radio activity, properties of fundamental particles, Artificial transmutation. Applications with respect to trans-uranic elements, carbon dating.

CO4: To study theory of volumetric analysis - Types of titrations, volumetric apparatus, calibration of pipette and burette, indicators used in pH - titrations, oxidizing agents usedin titrations. Theory of Internal, External and self-indicators for redox titration.

(Organic Chemistry) Paper IX

CO1: To understand structure, reactivity, and methods of preparation and chemical reactions of different types of compounds - alcohols, Phenols, aldehydes-ketones, amines and carboxylic acids.

CO2: To study named reactions- Pinacol-Pinacolone rearrangement, Fries Rearrangement, Claisen Rearrangement, Gatterman Synthesis and Reimer Tiemann Reaction, Baeyer- Villeger Oxidation, Benzoin, Aldol Knoenenagel condensations, Mannich Reactions. Hoffmann Bromamide Reactions, Gattermann Koch synthesis, Hell-Volhard-ZelinskyReaction. Regents in organic chemistry - LiAIH4, LTA, PTC.

CO3: To understand the basic functional group transformations, Aromatic electrophilic substitution reactions, nucleophilic additions.

(Physical Chemistry-I) Paper X

CO1: To understand the basic concepts in thermodynamics.

CO2: To understand the laws of thermodynamics and terms like W, q, du and dH for the expansion of ideal gases under isothermal and adiabatic conditions for reversible process,Hess"s law.

CO3: To study Carnot cycle, its applications, concept of entropy, Gibbs and Helmholtz Functions, Criteria for thermodynamic equilibrium and spontaneity, their advantage overentropy change. Variation A with P, V and T.

CO4: To understand equilibrium constant and free energy - law of mass action, Le Chatelier's principle, Reaction isotherm and reaction isochore, Clapeyron equation, Clausius-Clapeyron equation.

(Physical Chemistry-II) Paper XIV

CO1: To study the basic terms and laws, Henry law, Raoults law in phase equilibrium and

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phase rule.

CO2: To understand different systems- Water, Pb-Ag, Mg-Zn, $FeCl_3$-H_2O, phenol-water, trimethyl amine - water, nicotine- water system, acetone-dry ice.

CO3: To understand the concept of ideal behavior and deviations from ideality.

CO4: To understand the concept of conductivity and its types, Kohlrausch"s law, Arrhenius Theory of Electrolyte Dissociation, Ostwald"s dilution law, Transport number: and its determination, Conductometric titrations.

CO5: To familiarize with types of reversible electrodes, Nernst Equation, Cell E.M.F., single electrode potential, Reference electrodes, Electro-chemical series, Electrolytic and galvanic cells, types of cells, Thermodynamic quantities of cell reactions, Concepts - pH, pKa and their determination, Buffers- types, and mechanism of action, Henderson-Hasselbalch equation. Corrosion: Concept, types and electrochemical theory.

(Inorganic Chemistry) Paper XIII

CO1: To familiarize with transition elements, lanthanides and actinides with reference to characteristics, position in periodic table and variation in periodic properties.

CO2: To understand concepts and theories in coordination compounds -Werner"s co-ordination theory, EAN rule, VBT, isomerism, chelates.

CO3: To understand the concepts of acids and bases - Arrhenius, Bronsted-Lawry, Lux-Flood, Solvent System and Lewis Concept of Acids and Bases

CO4: To study chemical reaction in non-aqueous solvents.

Paper XVII Physical Chemistry

CO1: To understand concepts in Quantum Mechanics - Black body radiation, Planck's radiation law, photoelectric effect, Bohr's modes of hydrogen atom, Compton Effect. De Broglie Hypothesis, the Heisenberg"s uncertainty principle, Harmiltonian operator, Schrödinger wave equation postulates of quantum mechanics. Schrödinger wave equationfor H-atom.

CO2: To study the basics of spectroscopy - Electromagnetic radiation, regions of the spectrum, Born-Oppenheimer approximation, Rotational Spectrum - Diatomic molecules, energy levels of a rigid rotor (semi classical principles), selection rule, rotational spectra of rigid diatomic molecule, determination of bond length.

CO3: To understand photochemistry - Photochemical processes, laws of photochemistry, Grothus - Drapper law, Stark-Einstein law, Jablonsiki diagram qualitative description of fluorescence, phosphorescence, nonradiative processes, quantum yield and photosensitized reactions.

CO4: To study some physical properties and their relation with the assignment of molecular

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structure- Optical activity, dipole moment, magnetic property.

CO5: To introduce nano-materials - Properties, methods of synthesis and applications.

Paper XVIII Organic Chemistry

CO1: To introduce organic spectroscopy - 1H NMR, shielding and DE shielding, chemical shifts, interpretation of PMR spectra of simple organic molecules, combined problems on UV,IR and PMR spectroscopic techniques.

CO2: To familiarize students with organometallic compounds - Structure, methods of synthesis and synthetic applications of Grignard reagents, Organozinc and organolithiumcompound.

CO3: To understand organic synthesis via enolates - Active methylene compounds, Claisen condensation, Acidity of alpha hydrogen and its synthetic applications.

CO4: To introduce Fats, oils and detergents - Saponification value, iodine value, and acid value. Detergents preparation of sodium alkyl sulphonate, alkyl benzene sulphonate, and amide sulphonate, cleansing action of detergent.

Paper XIX Organic Chemistry

CO1: To understand nature metal-ligand bonding in transition metal complexes - crystal field theory with respect to octahedral, tetrahedral and square planer complex.

CO2: To familiarize with electronic spectra of transition metal complexes.

CO3: To introduce organo metallic compounds - classification, nomenclature, synthesis and reactions.

CO4: To study the roles and biological functions of metals in biological systems.

CO5: To introduce chromatography - types, classification and applications.

Paper No. XVII Organic Chemistry

CO1: Curriculum benefits to study the heterocyclic compounds in details, their aromatic characters and importance in medicinal chemistry, structure elucidation of five- and six-member heterocyclic compounds using molecular orbital theory.

CO2: It covers synthesis and properties of some five- and six-member heterocyclic compounds.

CO3: It helps to study carbohydrates chemistry and their importance.

CO4: It covers synthesis and properties of some polymers, polymerization reactions.

CO5: It covers constitution, classification, synthesis and properties of some dyes.

CO6: It covers constitution, classification, synthesis, properties and applications of some drugs.

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COs : Physics

F. Y. B. Sc. Physics 101- Paper No I: Mechanics, properties of matter & sound:

CO1: To familiarize students with basic concepts of Mechanics.
CO2: To have deep understanding of Newton,,s laws of gravitation and their applications.
CO3: To understand the concepts of viscosity and elasticity thoroughly.
CO4: To understand the phenomena of surface tension and its applications.
CO5: To understand the concept of ultrasonic and acoustics effectively.
CO6: To enable students to solve numerical problems involving topics covered.

Paper No II: Heat and Thermodynamics

CO1: To understand the concept of thermal conductivity and its application.
CO2: To understand the concept of real gases and transform phenomena.
CO3: To enable students to understand the laws of thermodynamics and thermodynamic processes.
CO4: To study the concept of entropy thoroughly.
CO5: To study heat engines and their efficiency.
CO6: To enable studnets to solve numerical problems involving topics covered.

Semester II 104- Paper No IV: Geometrical and Physical Optics

CO1: To familiarize students with basic concepts of optics.
CO2: To have deep understanding of cardinal points of optical system.
CO3: To understand the concept of interference thoroughly.
CO4: To enable students to summarize the phenomena of diffraction and polarization.
CO5: To enable to solve numerical problems involving topics covered.

Paper No V: Electricity and Magnetism

CO1: To understand the basic concepts and laws in electrostatics.
CO2: To study the basic concepts and laws in dielectrics.
CO3: To get knowledge of the basic concepts and laws of magnetism.
CO4: To understand the basic concepts of Transient current.
CO5: To enable students to solve numerical problems involving topics covered

S. Y. B. Sc. Physics Semester III 201- Paper No VII: Mathematical, Statistical Physics and Relativity

CO1: To familiarize students with the mathematical methods used in physics.
CO2: To familiarize students with the vector algebra.
CO3: To get acquaintance with the differential equations.
CO4: To familiarize students with partial differential equations.
CO5: To familiarize students with Classical and quantum Statistics.
CO6: To understand the concepts of special theory of relativity.
CO7: To apply these mathematical methods to solve problems in physics.

202- Paper No VIII: Modern and Nuclear Physics

CO1: To familiarize students with basic properties of nucleus.
CO2: To have deep understanding of radioactivity and its applications.
CO3: To familiarize students with nuclear forces and elementary particles.
CO4: To understand construction and working of various particle accelerators and detectors.
CO5: To understand construction and working of photoelectric effect.
CO6: To study different photoelectric cells.
CO7: To enable students to solve numerical problems involving topics covered.

Semester IV 205- Paper No XI: General Electronics

CO1: To familiarize students with the basic electronic components.
CO2: To understand the concept of semiconductors.

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CO3: To have deep knowledge about semiconductor devices.

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CO4: To familiarize with the transistor circuits and there characteristics.
CO5: To understand oscillators and multivibrators.
CO6: To understand the process of modulation and demodulation.
CO7: To solve numerical problems involving topics covered.

206- Paper No XII: Solid state Physics
CO1: To familiarize students with basic concepts of structure of solids.
CO2: To familiarize with various types of characterization techniques.
CO3: To understand the concept of bonding and band theory of solids deeply.
CO4: To understand the transport properties thoroughly.
CO5: To enable students to solve numerical problems involving topics covered.

T. Y. B. Sc. Semester V 54 301- Paper No XV: Classical and Quantum Mechanics
CO1: To understand the mechanics of the system of particles.
CO2: To understand d"Albert, principle, Langranges Equation and its application.
CO3: To familiarize students with the historical background of Quantum Mechanics.
CO4: To understand the wave function and its physical interpretation clearly.
CO5: To familiarize with the time dependent and time independent Schrodinger equations and
their applications.
CO6: To familiarize students with various operators used in Quantum Mechanics.
CO7: To enable students to solve numerical problems involving topics covered

Paper No XVI: Electrodynamics
CO1: To familiarize students with various differential operators to study the Gauss law.
CO2: To familiarize with basic concepts and equations related to time varying fields such as Faradays law, Len"s law etc.
CO3: To write expression for poynting vectors for electromagnetic waves.
CO4: To enable to to write wave equations.
CO5: To solve numerical problems involving topics covered.

Semester VI 305- Paper No XIX: Atomic, Molecular Physics and LASER
CO1: To familiarize students with conceptual development of atomic model.
CO2: To understand one or two valence electron systems deeply.
CO3: To understand Zeeman effect, paschan back effect, Stark effect.
CO4: To understand Molecular Raman Spectroscopy.
CO5: To have deep introduction to lasers.
CO6: To familiarize students with different types of laser.
CO7: To understand construction and working of various types of lasers.
CO8: To be aware with various applications of lasers.
CO9: To enable students to solve numerical problems involving topics covered.

Paper No XX: Non-conventional Energy sources and Optical Fibers
CO1: To introduce students with various types of renewable energy sources.
CO2: To familiarize students with various applications of solar energy.
CO3: To familiarize students with various applications of biomass energy.
CO4: To familiarize students with the wind mechanics.
CO5: To create awareness among students about energy conservation.
CO6: To familiarize students with optical fibers.
CO7: To familiarize students with various applications of optical fibers.
CO8: To enable students to solve numerical problems involving topics covered.

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BIOTECHNOLOGY

COs POs PSOs

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Programme Outcomes - B. Sc.

PO1: Scientific temperament: It inculcates scientific attitude in the minds of learners in physical, chemical, material, life and mathematical sciences. Students acquire scientific abilities like logical thinking, problem solving approach, data collection and decision making.

PO2: Basic scientific knowledge: Students acquire scientific knowledge to extract information, formulate and solve problems in systematic manner.

PO3: Technical competence and practical skills: The learners acquire skills to handle basic scientific instruments following the general lab safety practices through experimental skills

PO4: Creative thinking and numerical ability: It empowers the learners with creative thinking and numerical ability.

PO5: Environment and sustainability: It provides understanding of current environmental scenario and necessity of sustainability along with solutions. Students are made aware of environment related issues and sustainable technology development.

PO5: Competency: The programme prepares learners for post-graduation and higher education. Students get eligible for appearing to the competitive exams such as MPSC and banking sectors.

Programme Outcomes – M. Sc.

PO1: Scientific knowledge: Leaners acquire scientific knowledge. Students acquire ability to integrate and in-depth knowledge in the concerned subject. The programme gives the interdisciplinary applications of the respective subject.

PO2: Problem analysis and analytical thinking: Learners can identify, formulate, review research literature, formulate research problem, and analyze them and derive conclusions. Learner can develops ability to formulate research problem using the basic principles of mathematical, biological, physical and chemical sciences.

PO3: Research skills: Students can acquire research skills through project works which are the foundations of research.

PO4: Basic instrumentation handling: Learners acquire skills of handling basic instrumentation skills.

PO5: Design / development of solutions: Learners can design solutions for scientific problems through practical based experiential learning for cultural, societal, and environmental considerations.

PO6: Development: Learners can acquire knowledge independently for personal and professional development.

PO7: Research Aptitude: Basic orientations of students towards research methodology and project work.

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PSOs of B.Sc. Biotechnology

PSO01: Graduates will gain and apply knowledge of Biotechnology, Science and Engineering concepts to solve problems related to field of Biotechnology (**BL3**).
PSO02: Graduates will be able to identify, analyze and understand problems related to biotechnology and finding valid conclusions with basic knowledge in biotechnology (**BL4**).
PSO03: Graduates will be able to design and develop solution to Biotechnology problems by applying appropriate tools while keeping in mind safety factor for environmental & society (**BL6**).
PSO04: Graduates will be able design, perform experiments, analyze and interpret data for investigating complex problems in biotechnology and related fields (**BL6**).
PSO05: Graduates will be able to decide and apply appropriate tools and techniques in biotechnological manipulation (**BL5**).
PSO06: Graduates will be able to justify societal, health, safety and legal issues and understand his responsibilities in biotechnological engineering practices (**BL2**).
PSO07: Graduates will be able to understand the need and impact of biotechnological solutions on environment and societal context keeping in view need for sustainable solution (**BL5**).
PSO08: Graduates will have knowledge and understanding of related norms and ethics in biotechnology product / technique development (**BL2**).
PSO09: Graduates will be able to undertake any responsibility as an individual and as a team in a multidisciplinary environment (**BL3**).
PSO10: Graduates will develop oral and written communication skills (**BL6**).
PSO11: Graduates will have thorough knowledge in Biotechnology and will also be ready to engage themselves in lifelong learning (**BL2**).
PSO12: Graduates will be able to demonstrate knowledge of project and finance management when dealing with Biotechnology problems (**BL3**).

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PSOs of M. Sc. Biotechnology

The course aims to provide an advanced understanding of the core principles and topics of Biotechnology and their experimental basis, and to enable students to acquire a specialized knowledge and understanding of selected aspects by means of a lecture series and a research project. Hence, the main objectives of the program are:

PSO01: To provide an introduction to the basic concepts of Biotechnology and its recent advances (**BL2**).

PSO02: For the basic understanding, this course includes advanced biochemistry, cell and molecular biology, immune technology, and microbial biotechnology. Moreover, several laboratory courses given in the individual sections of the curriculum with detailed information on the importance of biotechnology in basic and applied research (**BL2**).

PSO03: Finally this course explains the advanced sections of biotechnology like genetic engineering, nano-biotechnology, computational biology and medical biotechnology (**BL3**).

PSO04: This course provides necessary theoretical and practical experience in all divisions of biotechnology to pursue a professional career in this field (**BL2**).

PSO05: To provide broad exposure to various societal, ethical and commercial issues in the various aspects of biotechnology (**BL3**).

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COs : Biotechnology

B.Sc. Biotechnology Paper-I: Physical Chemistry

After completion of course/paper students will be able to:

CO1: To acquaint students with concepts in thermodynamics, kinetics and redox reactions.

CO2: To impart skills in kinetics and chemical reactions.

Paper-II: Organic and Inorganic Chemistry

After completion of course/paper students will be able to:

CO1: To acquaint students with bioorganic molecules.

CO2: To impart the knowledge of classification, structure and characterization of biomolecules.

Paper-III: Microbial cell diversity

After completion of course/paper students will be able to:

CO1: To study origin, evolution, and genetic diversity of microbial life

CO2: To study physiological diversity of metabolic and bioenergetics pathways

CO3: To understand the process of microbial speciation.

Paper-IV: Biostatistics

After completion of course/paper students will be able to:

CO1: Use and interpret results of, descriptive statistical methods effectively.

CO2: Demonstrate an understanding of the central concepts of modern statistical theory and their probabilistic foundation.

CO3: Select from, use, and interpret results of, the principal methods of statistical inference and design.

CO4: Communicate the results of statistical analyses accurately and effectively.

CO5: Make appropriate use of statistical software.

CO6: Read and learn new statistical procedures independently.

Paper-V: Instrumentation

After completion of course/paper students will be able to:

CO1: To understand safety measures in laboratory, handling and care of instruments.

CO2: Determination of pK_a, Standard solutions.

CO3: Monochrome staining, negative staining, Gram s staining.

CO4: Biochemical test, specific gravity, viscocity.

CO5: Motility testing by hanging drop method

Paper-VI: Biomolecules

After completion of course/paper students will be able to:

CO1: To understand the basic component or biomolecules of living organisms

CO2: To understand the classification, biological function and chemical and physical properties of carbohydrates, lipids, nucleic acids and proteins.

Paper-VII: Organic Chemistry

After completion of course/paper students will be able to:

CO1: Demonstrate an intermediate ability to use effective written and/or oral communication through the application of organic chemistry concepts and reasoning using the language of chemistry.

CO2: Demonstrate a basic understanding of how organic chemistry impacts the natural and technological environments.

CO3: Demonstrate an intermediate ability to use detailed data collection and analysis in order to explore organic chemical principles, effectively communicate, and critically evaluate results in the context of the material covered in Organic Chemistry I.

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CO4: Demonstrate a basic understanding of organic chemistry principles to effectively solve problems encountered in everyday life and in science using appropriate computational skills.

Paper-VIII: Inorganic and Physical Chemistry

CO1: Students will be able to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments.

CO2: Students will be skilled in problem solving, critical thinking and analytical reasoning as applied to scientific problems.

CO3: Students will be able to clearly communicate the results of scientific work in oral, written and electronic formats to both scientists and the public at large.

CO4: Students will be able to explore new areas of research in both chemistry and allied fields of science and technology.

Paper-IX: Microbial growth and control

After completion of course/paper students will be able to:

CO1: Recognize and explain the significant role that microbes play in the world around us.

CO2: Recognize and be able to explain the similarities and differences of microbes as compared to higher forms of life.

CO3: Identify microbes and explain methods of growth and cultivation as well as structural and biochemical differences.

CO4: Demonstrate an understanding of microbial structure, function, metabolism, growth, genetics, and control including antibiotic usage.

CO5: Be able to explain the basic principles of immunology relating to host resistance, antigenantibody
reactions, vaccination, organism virulence and their ability to cause disease.

CO6: Evaluate the physical and chemical method s of microbial control.

Paper-X: Biomathematics

After completion of course/paper students will be able to:

CO1: Apply mathematical concepts and principles to perform computations in life sciences.

CO2: Apply mathematics to solve problems in biology.

CO3: Create, use and analyze graphical representations of mathematical relationships

CO4: Communicate mathematical knowledge and understanding

CO5: Apply technology tools to solve problems in biological systems.

Paper-XI: Macromolecules

After completion of course/paper students will be able to:

CO1: Name and outline mechanisms for the non-covalent forces that operate on biomolecules

CO2: Discuss the four structure levels of proteins

CO3: Explain the significance of hydrophobic and hydrophilic forces for the structure of biomolecules and give examples thereof.

CO4: Explain the significance of steric effects for the structure of biomolecules and give examples thereof.

CO5: Outline and exemplify the relation between structure and function of biomolecules

CO6: Draw the basic structure of carbohydrates, nucleic acids, peptides/proteins and lipids.

CO7: Name the functional groups in carbohydrates, nucleic acids, peptides/proteins and lipids.

CO8: Name heterocyclic rings.

CO9: Sketch common chemical and enzymatic reactions for the above mentioned functional groups and heterocyclic rings.

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CO10: Be familiar with the principles in chemical syntheses of nucleic acids and peptides.
CO11: Use nomenclature from stereochemistry on biomolecules.
CO12: Sketch biomolecules and heterocyclic rings at various pH values.

Paper-XII: Biotechniques

After completion of course/paper students will be able to:
CO1: The student will demonstrate an understanding of practical techniques used in biotechnology, including basic background information and theory, applications, limitations, advantages and disadvantages, common problems and troubleshooting.
CO2: The student will demonstrate a thorough understanding of fundamental biochemical calculations.
CO3: The student will demonstrate an understanding of the principles behind searching, finding and evaluating pertinent scientific information.
CO4: The student will demonstrate an understanding of the structure, format and principles of writing in a technical scientific format.
CO5: The student will demonstrate an awareness of current events in biotechnology and their financial, social and ethical implications.

B.Sc. Biotechnology S.Y. (III semester) Paper-XIII: Basics of immunology

After completion of course/paper students will be able to:
CO1: Conceptualize how the innate and adaptive immune responses coordinate to fight invading pathogens.
CO2: Determine what immunomodulatory strategies can be used to enhance immune responses or to suppress unwanted immune responses such as might be required in hypersensitivity reactions, transplantations or autoimmune diseases.
CO3: Critically review the sample literature to determine the strengths and weaknesses of the data published in immunology and its novelty.
CO4: Explore strategies to improve existing vaccines and how to approach these.

Paper-XIV: General Virology

After completion of course/paper students will be able to:
CO1: Describe elements of the viral life cycle.
CO2: Explain viral replication strategies and compare replication mechanisms used by viruses relevant for human disease.
CO3: Explain host antiviral immune mechanisms.
CO4: Describe viral strategies to evade host immune and cellular factors (by use of examples of viruses relevant for human disease).
CO5: Discuss principles of virus pathogenesis,
CO6: Describe methods used for laboratory diagnosis of viral infections.
CO7: Explain vaccine strategies and mechanisms of antiviral drugs,
CO8: Coherently report outcomes of virological research in oral and written output

Paper-XV: Developmental Biology

After completion of course/paper students will be able to:
CO1: To understand the process of animal development.
CO2: To know the process of early embryonic development.
CO3: To understand the process of morphogenesis & organogenesis in animals.
CO4: To study the cell death and regeneration.

Paper-XVI: Chromosome structure and inheritance

After completion of course/paper students will be able to:

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CO1: Describe how cellular information is relayed and the process of genetic replication is undertaken in cells.
CO2: Demonstrate an understanding of the basic concepts of genetics, including Mendelian genetics, DNA and chromosome structure and gene expression and apply that knowledge to real life problems and case studies.
CO3: Solve simple problems arising from changes in genetic and biochemical processes at the cellular level, especially as these may relate to the activities of whole organisms.
CO4: Defend an opinion on ethical issues relating to controversial procedures, and offer informed comment on current views and hypotheses dealing with cell level biology and biotechnology.

Paper-XVII: Basics of enzymology

After completion of course/paper students will be able to:
CO1: Understand the major classes of enzyme and their functions in the cell.
CO2: Role of co-enzyme cofactor in enzyme catalyzed reaction.
CO3: Differentiate between equilibrium and steady state kinetics and analyzed simple kinetic data and estimate important parameter (Km. Vmax, Kcat etc).
CO4: To define and describe the properties of enzymes in and regulates biochemical pathways (inhibition, allosterism).

Paper-XVIII: Animal Physiology

After completion of course/paper students will be able to:
CO1: Understand the physiological processes that regulate body functions and the regulation of an organ system from the molecular all the way to the whole animal level.
CO2: Be able to describe interactions between different organ systems (homeostasis).
CO3: Know the anatomy of different physiological systems and their specific functions.
CO4: Understand how changes in one system may impact a different system
CO5: Be able to apply knowledge of a physiological mechanism to explaining how a whole animal physiological process occurs (i.e. gestation, lactation, etc.)

Paper-XIX: Cell Biology

After completion of course/paper students will be able to:
CO1: Basic chemical composition of living matter.
CO2: Structural characteristics of prokaryotic and eukaryotic cells.
CO3: Taxonomy and characteristics of the major kingdoms.
CO4: Mechanics of membrane transport.
CO5: Basic concepts of bioenergetics, photosynthesis, and cellular respiration. 6. Mechanics of cellular reproduction.
CO7: Mendelian genetics and genetic change.
CO8: Nucleic acids and basic concepts of protein synthesis and gene regulation.

Paper-XX: Plant physiology

After completion of course/paper students will be able to:
CO1: The aim is to give the students increased knowledge of metabolism, physiology and structure of plants together with a better understanding of regulation of growth and development and influence of environment.

Paper-XXI: Genetics

After completion of course/paper students will be able to:
CO1: Comprehensive, detailed understanding of the chemical basis of heredity
CO2: Comprehensive and detailed understanding of genetic methodology and how

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quantification of heritable traits in families and populations provides insight into cellular and molecular mechanisms.
CO3: Understanding of how genetic concepts affect broad societal issues including health and disease, food and natural resources, environmental sustainability, etc.
CO4: Understanding the role of genetic mechanisms in evolution.

Paper-XXII: Central dogma

After completion of course/paper students will be able to:
CO1: Differentiate among the three kinds of RNA in terms of structure and function.
CO2: Understand the kind of code present in the nucleotide sequence of DNA.
CO3: Describe the process of transcription, its machinery, and end products.
CO4: Describe the process of translation, its machinery, and end products.
CO5: Understand how specific amino acids are added to the proper tRNAs.
CO6: Describe the process of protein synthesis.
CO7: Understand how transcription, translation, and protein synthesis are interrelated.
CO8: Know the differences between prokaryotic and eukaryotic protein synthesis.
CO9: Understand why eukaryotic gene transcripts must be spliced.

Paper-XXIII: Advanced enzymology

After completion of course/paper students will be able to:
CO1: Understand the theories of enzyme catalytic power.
CO2: Understand the relationship between 3D enzyme structure and catalytic and kinetic properties.
CO3: Understand the diversity of catalytic strategies.
CO4: Possess the knowledge about enzymes" application in recent biotechnology.

Paper-XXIV: Advanced Immunology

CO1: To have a detailed understanding of lymph node microanatomy and know how B and T cells encounter antigen and develops in different locations.
CO2: To know antigen presentation and autophagy on a detailed molecular level
CO3: To understand immunology of mucosal surfaces and the interplay between commensal flora and and the immune system in the gut.
CO4: To understand the cellular and molecular basis for autoimmune disease and allergies.
CO5: To get the knowledge of tumor immunology and the development of novel recombinant antibodies for treatment of cancer and autoimmune disease.
CO6: To gain in depth knowledge of a relevant research article and present this for the group.

Paper-XXV: Regulation of gene expression

After completion of course/paper students will be able to:
CO1: Explain the mechanism by which transcription is initiated in eukaryotic cells.
CO2: Illustrate methods to identify key regulatory elements within a eukaryotic promoter.
CO3: Explain how transcriptional control is achieved through alterations in chromatin structure and methylation.
CO4: Outline the mechanisms by which post-transcriptional control is achieved.
CO5: Explain the structure, formation and function of micro RNAs.
CO6: Outline the mechanisms and factors that control the process of translation.
CO7: An ability to critically evaluate and discuss original research articles in the area of gene regulation.

Paper-XXVI: Introduction to Bioinformatics

After completion of course/paper students will be able to:

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CO1: Have a deep knowledge and awareness of the basic principles and concepts of biology, computer science and mathematics.
CO2: Existing software effectively to extract information from large databases and to use this information in computer modeling.
CO3: Problem-solving skills, including the ability to develop new algorithms and analysis methods.
CO4: Understand the intersection of life and information sciences, the core of shared concepts, language and skills the ability to speak the language of structure-function relationships, information theory, gene expression, and database queries.

Paper-XXVII: Principles of genetic engineering

After completion of course/paper students will be able to:
CO1: Technical know, how on versatile techniques in recombinant DNA technology.
CO2: An understanding on application of genetic engineering techniques in basic and applied experimental biology.
CO3: Proficiency in designing and conducting experiments involving genetic manipulation.

Paper-XXVIII: Fermentation design and process

After completion of course/paper students will be able to:
CO1: To understand the various concepts of fermentation.
CO2: To know the differences between aerobic and anerobics fermentation and the classification of microorganisms.
CO3: To understand the growth of micro-organisms.
CO4: Isolation and identification of micro-organisms from fermenting fruits, cereals and milk.
CO5: Design a simple containment system (Bioreactor/Fermenter).

Paper-XXIX: Plant Tissue Culture

After completion of course/paper students will be able to:
CO1: Explain the various steps taken to established and optimize medis for particular purposes in particular species.
CO2: Explain the various components of plant tissue culture media.
CO3: Explain various cell lines used in tissue culture and their origins and uses.

Paper-XXX: Clinical Biochemistry

After completion of course/paper students will be able to:
CO1: Clinically assess the laboratory indicators of physiologic conditions and diseases.
CO2: Know the biochemical and molecular tools needed to accomplish preventive, diagnostic and therapeutic intervention on hereditary and acquired disorders.

Paper-XXXI: Genomics and Proteomics

After completion of course/paper students will be able to:
CO1: Infer the basic concepts of genomics, transcriptomics and proteomics.
CO2: List and discuss the use of genomics and proteomics in human health.
CO3: Suggest and outline solution to theoretical and experimental problems in genomics and proteomics fields.

Paper-XXXII: RDT

After completion of course/paper students will be able to:
CO1: To illustrate creative use of modern tools and techniques for manipulation and analysis of genomic sequences.
CO2: To expose students to application of recombinant DNA technology in biotechnological

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research.
CO3: To train students in strategizing research methodologies employing genetic engineering techniques.

Paper-XXXIII: Fermentation Technology

After completion of course/paper students will be able to:

CO1: Understand the various concepts of fermentation.

CO2: Know the differences between aerobic and anerobics fermentation and the classification of micro-organisms.

CO3: Understand the growth of micro-organisms.

CO4: Isolation and identification of micro-organisms from fermenting fruits, cereals and milk.

CO5: Design a simple containment system (Bioreactor / Fermenter).

Paper-XXXIV: Bioethics

After completion of course/paper students will be able to:

CO1: Identify the historical forces that have contributed to the current global systems and these systems" consequences for humanity and/or the environment.

CO2: Explain how the theoretical approaches of the social sciences analyze and evaluate the impact of social class, race and/or gender on self and group identity and people"s responses to diversity.

CO3: Communicate effectively about major social and cultural trends of people living in non-Western regions, particularly their religious patterns.

CO4: Critically integrate academic insights in global systems and social and cultural trends as well as theoretical approaches of the social sciences into coherent arguments in the field of global bioethics.

CO5: Research and write brief scholarly essays that present cogent argument(s), engage scholarly literature, and demonstrate critical thinking and analysis regarding global bioethics.

Paper-XXXV: Ecology and evolution

After completion of course/paper students will be able to:

CO1: Understand the structure and function of ecosystem.

CO2: Population study

CO3: Pollution and its effect on population.

Paper-XXXVI: Metabolism

After completion of course/paper students will be able to:

CO1: Demonstrate and understanding of metabolic pathways.

CO2: Understanding of disease related metabolic pathways.

M.Sc. Biotechnology Paper-I: Biomathematics and statistics

After completion of course/paper students will be able to:

CO1: Apply basic statistical concepts commonly used in Health and life Sciences.

CO2: Use basic analytical techniques to generate results.

CO3: Interpret results of commonly used statistical analyses in written summaries.

CO4: Demonstrate statistical reasoning skills correctly and contextually.

Paper-II: Biomolecules and Bioenergetic

After completion of course/paper students will be able to:

CO1: Describe/recognize amino acid structures, describe their physical and chemical properties, and predict how their ionic charges change with pH.

CO2: Define primary, secondary, tertiary and quaternary structure in proteins and identify the

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types of interactions important in each case.
CO3: Describe the chemical nature of enzymes and their function in biochemical reactions.
CO4: Explain how enzyme activity is (a) regulated, and (b) affected by temperature, pH, and concentration.
CO5: Explain what happens during digestion of proteins, catabolism of amino acids and the urea cycle.
CO6: List the essential and non-essential amino acids and describe the general strategies for amino acid synthesis.
CO7: Describe/recognize the structure of mono-, di-, and polysaccharides; describe their physical and chemical properties and their function in living organisms.
CO8: Predict the products of chemical reactions of carbohydrates (acetal/hemiacetal formation or oxidation).
CO9: Describe what happens during carbohydrate digestion, glycolysis, glycogenesis, and glycogenolysis.
CO10: Describe/recognize lipid structures including lipids found in cell membranes and their transport across membranes.
CO11: Describe what happens in fatty acid oxidation and synthesis as well as in ketogenesis.

Paper-III: Microbiology

After completion of course/paper students will be able to:
CO1: Acquire, articulate, retain and apply specialized language and knowledge relevant to microbiology.
CO2: Acquire and demonstrate competency in laboratory safety and in routine and specialized microbiological laboratory skills applicable to microbiological research or clinical methods, including accurately reporting observations and analysis.
CO3: Communicate scientific concepts, experimental results and analytical arguments clearly and concisely, both verbally and in writing.
CO4: Demonstrate engagement in the Microbiology discipline through involvement in research or internship activities, the Microbiology Student Association club (MSA) and outreach or mentoring activities specific to microbiology.

Paper-IV: Inheritance biology

After completion of course/paper students will be able to:
CO1: Apply quantitative problem-solving skills to human genetics problems and issues.
CO2: Evaluate biological factors that influence human heredity.
CO3: Demonstrate their ability to reason both inductively and deductively with experimental information and data.
CO4: Explain the molecular and biochemical basis, diagnosis and treatment of genetic disease.
CO5: Select and apply experimental procedures to genetic screening.

Paper-V: Molecular biology

After completion of course/paper students will be able to:
CO1: Apply problem-solving skills to biological problems and issues.
CO2: Write up the results of an experimental study in a lab report.
CO3: Demonstrate their ability to reason both inductively and deductively with experimental information and data.
CO4: Explain the function, replication and evolution of genomes.
CO5: Select and apply experimental procedures to solve biological problems.

Paper-VI: Enzyme Technology

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After completion of course/paper students will be able to:
CO1: Appreciate the suitability of enzyme biotechnology as a sustainable alternative to the chemical industry.
CO2: Understand the various applications of enzymes in varied industrial processes.
CO3: Justify the critical conditions involved in the selection of typical enzymes in industrial processes.

Paper-VII: Cell Biology

After completion of course/paper students will be able to:
CO1: Describe cytological, biochemical, physiological and genetic aspects of the cell, including cellular processes common to all cells, to all eucaryotic cells as well as processes in certain specialized cells.
CO2: Relate normal cellular structures to their functions.
CO3: Explain cellular processes and mechanisms that lead to physiological functions as well as examples of pathological state.
CO4: Apply modern cellular techniques to solve aspects of scientific problems.
CO5: Describe the intricate relationship between various cellular structures and their corresponding functions.

Paper-VIII: Basic immunology

After completion of course/paper students will be able to:
CO1: Conceptualize how the innate and adaptive immune responses coordinate to fight invading pathogens.
CO2: Determine what immunomodulatory strategies can be used to enhance immune responses or to suppress unwanted immune responses such as might be required in hypersensitivity reactions, transplantations or autoimmune diseases.
CO3: Critically review the sample literature to determine the strengths and weaknesses of the data published in immunology and its novelty.
CO4: Explore strategies to improve existing vaccines and how to approach these.

Paper-IX: Applied immunology and virology

CO1: Have a detailed understanding of lymph node microanatomy and know how B and T cells encounter antigen and develops in different locations.
CO2: Know antigen presentation and autophagy on a detailed molecular level.
CO3: Understand immunology of mucosal surfaces and the interplay between commensal flora and and the immune system in the gut.
CO4: Have deep knowledge of the cellular and molecular basis for autoimmune disease and allergies.
CO5: Have basic knowledge of tumor immunology and the development of novel recombinant antibodies for treatment of cancer and autoimmune disease.
CO6: Explain vaccine strategies and mechanisms of antiviral drugs, coherently report outcomes of virological research in oral and written output.
CO7: Gain in depth knowledge of a relevant research article and present this for the group.
CO8: Describe elements of the viral life cycle.
CO9: Explain viral replication strategies and compare replication mechanisms used by viruses relevant for human disease.
CO10: Explain host antiviral immune mechanisms.
CO11: Describe viral strategies to evade host immune and cellular factors (by use of examples of viruses relevant for human disease).

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CO12: Discuss principles of virus pathogenesis, Describe methods used for laboratory diagnosis of viral infections.

Paper-X: Gene expression and engineering

After completion of course/paper students will be able to:

CO1: Explain the mechanism by which transcription is initiated in eukaryotic cells.

CO2: Illustrate methods to identify key regulatory elements within a eukaryotic promoter

CO3: Explain how transcriptional control is achieved through alterations in chromatin structure and methylation.

CO4: Outline the mechanisms by which post-transcriptional control is achieved.

CO5: Explain the structure, formation and function of micro RNAs.

CO6: Outline the mechanisms and factors that control the process of translation.

CO7: An ability to critically evaluate and discuss original research articles in the area of gene regulation.

Paper-XI: Developmental biology

After completion of course/paper students will be able to:

CO1: To understand the process of animal development.

CO2: To know the process of early embryonic development.

CO3: To understand the process of morphogenesis & organogenesis in animals.

CO4: To study the cell death and regeneration.

Paper-XII: Bioinstrumentation

After completion of course/paper students will be able to:

CO1: To understand safety measures in laboratory, handling and care of instruments.

CO2: Determination of pKa, Standard solutions.

CO3: Monochrome staining, Negative staining, Gram s staining.

CO4: Biochemical test, specific gravity, Viscocity.

CO5: Motility testing by hanging drop method.

Paper-XIII: Industrial technology

After completion of course/paper students will be able to:

CO1: Have a working knowledge of business practices in industry.

CO2: Convey good people and communication skills.

CO3: Demonstrate knowledge of common practices of employer and employee relationships.

Paper-XIV: RDT

After completion of course/paper students will be able to:

CO1: To illustrate creative use of modern tools and techniques for manipulation and analysis of genomic sequences.

CO2: To expose students to application of recombinant DNA technology in biotechnological research.

CO3: To train students in strategizing research methodologies employing genetic engineering techniques.

Paper-XV: Tissue technology

After completion of course/paper students will be able to:

CO1: Explain the various steps taken to established and optimize media for particular purposes in particular species.

CO2: Explain the various components of plant tissue culture media.

CO3: Explain various cell lines used in tissue culture and their origins and uses.

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Paper-XVI: Bioinformatics

After completion of course/paper students will be able to:

CO1: To understand the basic principles and concepts of biology, computer science and mathematics.

CO2: Existing software effectively to extract information from large databases and to use this information in computer modeling.

CO3: Have problem-solving skills, including the ability to develop new algorithms and analysis methods.

CO4: Understand of the intersection of life and information sciences, the core of shared concepts, language and skills the ability to speak the language of structure-function relationships, information theory, gene expression, and database queries.

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M.Sc Chemistry COs POs PSOs

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Programme Outcomes - B. Sc.

PO1: Scientific temperament: It inculcates scientific attitude in the minds of learners in physical, chemical, material, life and mathematical sciences. Students acquire scientific abilities like logical thinking, problem solving approach, data collection and decision making.

PO2: Basic scientific knowledge: Students acquire scientific knowledge to extract information, formulate and solve problems in systematic manner.

PO3: Technical competence and practical skills: The learners acquire skills to handle basic scientific instruments following the general lab safety practices through experimental skills

PO4: Creative thinking and numerical ability: It empowers the learners with creative thinking and numerical ability.

PO5: Environment and sustainability: It provides understanding of current environmental scenario and necessity of sustainability along with solutions. Students are made aware of environment related issues and sustainable technology development.

PO5: Competency: The programme prepares learners for post-graduation and higher education. Students get eligible for appearing to the competitive exams such as MPSC and banking sectors.

Programme Outcomes – M. Sc.

PO1: Scientific knowledge: Leaners acquire scientific knowledge. Students acquire ability to integrate and in-depth knowledge in the concerned subject. The programme gives the interdisciplinary applications of the respective subject.

PO2: Problem analysis and analytical thinking: Learners can identify, formulate, review research literature, formulate research problem, and analyze them and derive conclusions. Learner can develops ability to formulate research problem using the basic principles of mathematical, biological, physical and chemical sciences.

PO3: Research skills: Students can acquire research skills through project works which are the foundations of research.

PO4: Basic instrumentation handling: Learners acquire skills of handling basic instrumentation skills.

PO5: Design / development of solutions: Learners can design solutions for scientific problems through practical based experiential learning for cultural, societal, and environmental considerations.

PO6: Development: Learners can acquire knowledge independently for personal and professional development.

PO7: Research Aptitude: Basic orientations of students towards research methodology and project work.

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COs : M.Sc Chemistry

M. Sc. - I Organic and Analytical Chemistry CHE-101: Analytical Chemistry

CO1: To understand basic concepts in analytical chemistry - Role of analytical chemistry, qualitative and quantitative analysis, the analytical process, validation of a method.

CO2: To understand the methods of statistical treatment of analytical data.

CO3: To study the basic separation techniques in analytical chemistry.

CO4: To familarize with different chromatographic techniques- therory, experimental and different parameters - TLC, column, liquid-liquid partition, gel permeation, ion exchange, gas and HPLC.

CHE-102: Inorganic Chemistry

CO1: To familiarize with different spectroscopic term symbols, Orgel diagrams and Tanabe Sugano diagrams for different configurations.

CO2: To understand the interpretation electronic spectra of metal complexes.

CO3: To study the preparations, reactions and structures of metal carbonyls and nitrosyls and EAN rule.

CO4: To understand the chemistry of dioxygen, dinitrogen complexes and non-carbonyl metal
clusters.

CO5: To understand bioinorganic chemistry involved in biological systems.

CHE-103: Organic Chemistry

CO1: To study aromatic electrophilic and nucleophilic substitutions with reference to

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orientation and reactivity, energyprofile diagram, ortho/para ratio, IPSO substitution, orientation in other ring system, Recapitulation of halogenation, nitration, sulphonation and Fridel Craft''s reaction, diazonium coupling.
CO2: To understand nucleophilic substitution - S_N
$_{Ar}$, S_N
$_1$, benzyne mechanisum
CO3: Effect of substrate structure, leaving group and attacking nucleophile on reactivity.
CO4: To study reaction mechanism and reaction intermediates- carbocations, carbanions, free
radicals.
CO5: To study mechanism and stereochemical aspect of addition reaction involving electrophile, nucleophile and free radicals.
CO7: To understand regioselectivity and chemoselectivity, orientation and reactivity in addition
to carbon-carbon multiple bond; Michael addition, Sharpless asymmetric epoxidation.
CO8: Study of elimination and rearrangement reactions.

CHE-104: Physical Chemistry

CO1: To understand ionic equilibria and biological reactions.
CO2: To study therories of reaction rates, kinetics of reactions, methods of determing rates of reactions.
CO3: To study deeply classical and statistical thermodynamics.
CO4: Concepts and models to understand surface chemistry.
CO5: To understand advanced concepts in electrochemistry.

CHE-205: Spectroscopic methods of analysis

CO1: General introduction to spectral methods.
CO2: Basic concetps, instrumentation and applications of Microwave, Vibrational and Ramna
spectroscopy.
CO3: To understand the concept of photoelectron spectroscopy.
CO4: To study the thermal methods of analysis –TGA, DTA.
CO5: To understand the rpiciple, instrumentation, applications of UV, IR and NMR spectroscopy.
CO6: To enable studnets for structure elucidation of compounds using combined spectral data.

CHE-206: Inorganic chemistry

CO1: To understand spectroscopic term symbols, microstates, Orgel diagram.
CO2: Study of elelctronic spectra and magnetic properties of transition metal complexes.
CO3: To understand the preparation, properties and reactions of metal carbonyls and nitrosyls.
CO4: Inorganic chemistry of haemoglobin and myoglobin.

CHE-207: Organic chemistry

CO1: To understand aliphatic and aromatic electrophilc as well as nulceoplhilic substitutions reactions.
CO2: Mechanisms and sterochemical aspects of addiotns to C-C double bonds and carbonheteroatom
multiple bonds.
CO3: To understand various named reactions with mechanisms.

CHE-208: Physical chemistry

CO1: To understands basics and advanced concepts in quantum mechanics.
CO2: To understand phase rule and its applications to different systems.

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CO3: To study crystallography- law, symmetry elements, prileples of crystal structure.
CO4: To understand cocpets in photochemistry, photochemical processes and mathematicall equations.

M.Sc. II- Organic Chemsitry Structural elucidation by spectral methods [CHEO-313]
CO1: To understand spin-spin and different types of couplings.
CO2: To study principles and applications of mass and NMR Spectroscopy.
CO3: To study the basic principles and applications of Massbauer and ESR spectroscopy.
CO4: To understand structure elucidation of organic molecules by analysis of spectral data.

Organic Synthesis [CHEO-314]
CO1: To study aplications of different oxidizing reagents.
CO2: To study applications of various reducing reagents.
CO3: Synthesis and synthetic applications of of organic reagents applicable in synthetic organic
chemistry.
CO4: To study carbon-carbon and carbon-heteroatom bond forming reactions.
CO5: Study of ylides and enamines.

Asymmetric synthesis of and bio-organic chemistry [CHEO-315]
CO1: To understand classification and extraction of enzymes.
CO2: To introduce the studendets to enzyme as catalysts.
CO3: To study chemical structure of co- enzymes and cofactor.
CO4: To study chiral poll and Falkinanh model.

Photochemistry, free radical and pericyclic reaction [CHEO-316]
CO1: To study the principles and applications of pericyclic reactions.
CO2: To understand electro cyclic reactions and their applications.
CO3: To study importance of cycloadition reactions with examples.
CO4: To understand applications of photochemistry.
CO5: To understand free radical reactions.

Organic Synthesis retro synthetic Approach [CHEO-417]
CO1: To study importance and applications of disconnection approach.
CO2: To understand protecting groups for different functional groups in organic synthesis.
CO3: To study disconnection approach of cycloadition reactions.
CO4: To study disconnection strategies for ring synthesis.
CO5: To understand retrosynthesis of complex organic molecules.

Advanced organic and heterocyclic chemistry [CHEO-418]
CO1: To study structure, synthesis and recations of mono and fused ring heterocyclic compounds.
CO2: To have deep understanding advanced name reactions or reerach level in synthetic organic chemistry.
CO3: To study rearrangement reaction and its application.
CO4: To study the nomenclature and classification of heterocyclic compounds.
CO5: To understand synthesis and reactions of simple mono as well as fused heterocyclic compounds.

Chemistry of Natural product [CHEO-419]
CO1: To study terpenoides and carotenoides.
CO2: To understand chemistry of natural products and its applications.
CO3: To study sources, synthesis and applications of steroids.
CO4: To understand the biogenesis of natural products.

Medicinal Chemistry [CHEO-420]
CO1: To understand the classification of drugs.

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CO2: To study synthesis and applications of antibiotics drugs in common medicines.
CO3: To understand the basic principles and applications of medicinal chemistry.
CO4: To study concepts in pharmacokinetics.
CO5: To understand synthetic pathways for the synthesis of common drugs.

M. Sc. Analytical Chemistry Paper: CHE-313

CO1: To familiarize students with spectral methods of analysis.
CO2: To understand H1 NMR and its principle with numericals.
CO3: To understand C13 NMR and its principle with numericals.
CO4: To understand mass and its principle, working, terms related with mass and numericals.
CO5: To familiarize students with ESR, hyperfine splitting, related with ESR and numericals.
CO6: To understand Mossbauer spectroscopy principle, working, terms related with Mossbauer, and numericals.

Paper: CHEA-314

CO1: To familiarize students with general introduction of electro analytical techniques and their applications.
CO2: To understand potentiometer, coulometry, their principles, working, types, techniques, applications.
CO3: To understand polarography & cyclic voltametry -their principles, working, types, techniques applications.
CO4: To understand electro gravimetry - its principle, working, types, techniques, applications.

Paper: CHEA-315

CO1: To familiarize students with air pollution, types of pollution, effect of different pollutants
on air, effect of pollution on climate, human, its analysis & control.
CO2: To understand water pollution, aquatic environment, different types of trace elements causing water pollution, oxygen demanding, wastes, BOD, COD, monitoring techniques & methodology.
CO3: To understand chemical texology, soil analysis & terms related with it.
CO4: To understand industrial chemistry & terms related with it.
CO5: To familiarize students with green chemistry & terms related with it.

Paper: CHEA-316

CO1: To familiarize students with molecular luminescence spectroscopy.
CO2: To understand surface characterization by spectroscopy and microscopy.
CO3: To understand properties of supercritical fluid, principle, instrumentation, applications.
CO4: To understand radioactive nuclides and atomic X-ray spectroscopy.
CO5: To familiarize students the principles and applications of LC-MS, GC-IR, GC-MS, ICPMS,
MS-MS
CO6: To understand principle of automatio and flow injection analysis.

Paper: CHEA-417

CO1: To familiarize students with the analysis of ores & alloys.
CO2: To understand analysis of paints & pigments.
CO3: To understand analysis cement & building meterials.
CO4: To understand analysis of glass.
CO5: To familiarize students with explosive and cosmetic analysis.

Paper: CHEA-418

CO1: To familiarize students with general concepts of food analysis.

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CO2: To understand analysis of oils, fats & detergents.
CO3: To understand analysis of fertilizers & their classification.
CO4: To familiarize students with analysis of vitamins.

Paper: CHEA-419

CO1: To familiarize students with polymers & their classification.
CO2: To understand study of individual polymers.
CO3: To understand fuels and their analysis.
CO4: To familiarize students with petroleum, its occurrence and classification.

Paper: CHEA-420

CO1: To familiarize students with pharmaceutical analysis.
CO2: To understand pharmaceutical legislation.
CO3: To understand clinical analysis.
CO4: To familiarize students with forensic analysis, toxicology and classification
CO5: To understand pharmaceutical analysis II, introduction, types and properties.

ACH - 202 papers - X Classical & spectral methods of Analysis.

After studying this paper the student is able to understand

CO1: Titrimetric method of analysis
CO2: Gravimetric analysis
CO3: Spectral methods of analysis
CO4: Precipitation titrations
CO5: Complexometric titrations & some basic concepts of redox titrations.

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BCA COs

POs

PSOs

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PSOs of BCA

PSO01: B.C.A. programme facilitates the graduates to use and apply current technical concepts and practices in the core computer applications (**BL3**).

PSO02: Identify computer application related problems, analyze them and design the system or provide the solution for the problem considering legal, ethical and societal issues (**BL3**).

PSO03: The program also empowers the graduates to appear for various competitive examinations or choose the post graduate programme of their choice (**BL3**).

PSO04: Students learn to work and communicate effectively in interdisciplinary environment, either independently or in team, and demonstrate scientific leadership in academic and industry (**BL3**).

PSO05: Recognize the need for and an ability to engage in continuing professional development (**BL4**).

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COs : BCA

BCA (Science) CA101-T-Computer Fundamental:

CO1: To familiar with computer environment.
CO2: To familiarize with the basics of Operating System and business communication tools.
CO3: To identify the parts of the computer system.
CO4: To explain functioning of computer components.
CO5: To explain the process of problem solving using computer
CO6: To design an algorithmic solution for a given problem.

CA102-T- Digital Electronics:

CO1: To familiar with concepts of digital electronics
CO2: To learn number systems and their representation
CO3: To understand basic logic gates, Boolean algebra and K-maps
CO4: To study arithmetic circuits, combinational circuits and sequential circuits
CO5: To study comparative aspects of logic families.

CA103-T- 8086 Microprocessor:

CO1: To understand basic architecture of 16 bit microprocessors.
CO2: To understand interfacing of 16 bit microprocessor with memory and peripheral chips involving system design.
CO3: To understand techniques for faster execution of instructions and improve speed of operation and performance of microprocessors.
CO4: Microprocessor instruction sets, assembly language programming
CO5: Write programs to run on 8086 microprocessor based systems.

CA104-T-Programming in C –I:

CO1: To make the student learn a programming language.
CO2: To learn problem solving techniques.
CO3: To teach the student to write programs in C and to solve the problems.
CO4: To read, understand and trace the execution of programs written in C language.
CO5: To write the C code for a given algorithm.
CO6: To implement programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
CO7: To write programs those perform operations using derived data types.

CA105-T -Communication skill:

CO1: To demonstrate preparation and research skills for oral presentations.
CO2: To develop proper listening skills.
CO3: To articulate and enunciate words and sentences clearly and efficiently.
CO4: To show confidence and clarity in public speaking projects.
CO5: To demonstrate ability to gather information and apply it to persuade or articulate one's own point of view.

Goal Two: Written Communication

CO1: To understand the rules of spelling and grammar.
CO2: To read and analyze text and be able to summarize ideas in writing.
CO3: To organize thoughts in a manner that emphasizes flow and paragraph development
CO4: To learn proper footnoting and bibliography skills.
CO5: To understand different writing techniques and styles based on the communication medium being used.

Course code: CA106-T - Mathematical Foundation:

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CO1: To distinguish between statement logic and predicate logic.
CO2: To visualize data numerically and/or graphically.
CO3: To evaluate mathematical principles and logic design.
CO4: To apply induction, other proof techniques towards solving recurrences and other problems in elementary algebra, adapt, and design elementary deterministic and randomized algorithms to solve computational problems.
CO5: To illustrate by examples the basic terminology of functions, relations, and sets and demonstrate knowledge of their associated operations and the knowledge of mathematical modeling.
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CO6: To demonstrate effectively mathematical ideas/results verbally or in writing and utilize the knowledge of computing and mathematics appropriate to the discipline.
CO7: To understand the functions concepts and distinguish different types of functions.
CO8: Identify and describe various types of relations.
CO9: To explain trees and graphs to formulate computational problems.
CO10: Develop the ability to solve the recurrence relations by using various methods.

107P - Office Suite Practical (LAB):
A student is able to
CO1: Demonstrate the mechanics and uses of Word tables to organize and present data.
CO2: Demonstrate working knowledge of using Word"s themes and clip art to create a variety of visual effects.
CO3: Demonstrate working knowledge of Word"s advanced formatting techniques and presentation styles.
CO4: Demonstrate applicable knowledge and uses of accepted business style formatting conventions.
CO5: Create and design a spreadsheet for general office use.
CO6: Demonstrate the basic mechanics of creating a Power point presentation.

CA107P - Digital Electronics Practical (LAB) A student will be able to
CO1: Describe how analog signals are used to represent digital values in different logic families, including characterization of the noise margins.
CO2: Create the appropriate truth table from a description of a combinational logic function.
CO3: Create a gate-level implementation of a combinational logic function described by a truth table using and/or/inv gates.
CO4: Evaluate combinational and sequential logic designs using various metrics.
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CA109-P - Microprocessor-I (8086) Practical (LAB): A student is able to understand
CO1: Intel 8086 microprocessor architecture and real mode memory addressing.
CO2: Intel microprocessor addressing modes.
CO3: Assembly language programming and debugging.
CO4: Arithmetic calculations using 8086 microprocessor kit.
CO5: Transfer of data and exchange of data between various memory units.

CA110-P - C Programming-I Practical (LAB) A student is able to
CO1: Understand the fundamentals of C programming.
CO2: Choose the loops and decision making statements to solve the problem.
CO3: Implement different operations on arrays.
CO4: Basic mathematical calculations.

CA201-T - Data Structures:

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CO1: Students are able to choose appropriate data structure as applied to specified problem definition.
CO2: Students are able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
CO3: Students can apply concepts learned in various domains like DBMS, compiler construction etc.
CO4: Students can use linear and non-linear data structures like stacks, queues, linked list etc.

CA202-T -Operating System:
CO1: To understand functions, structures and history of operating systems.
CO2: To understand design issues associated with operating systems.
CO3: To understanding process management concepts including scheduling, synchronization, and deadlocks.
CO4: To familiarize with multithreading.
CO5: To study the concepts of memory management ncluding virtual memory.
CO6: To understand resources sharing among the users.
CO7: Master issues related to file system interface and implementation, disk management.
CO8: To familiar with protection and security mechanisms.
CO9: To familiar with various types of operating systems including UNIX.

CA203-T - I.T. Tools & Web Designing –I:
CO1: To learn the basics of internet and web designing.
CO2: To understand architecture of browser, server, web page, web sites & clients.
CO3: To know about internet domains, protocols and browser and server communication.
CO4: To get basic knowledge of HTML and DHTML language for web page development.
CO5: To know & understand concepts of internet programming using JavaScript.

CA204-T - C-Programming-II:
CO1: To understand creation of user defined functions for specific task in C language.
CO2: To understand about functions and its types and working.
CO3: To understand use of user defined data types such as structures & unions.
CO4: To enable students capable of dealing with memory using pointers.
CO5: To get information about library functions and storage classes in c language.
CO6: To get knowledge about preprocessor directives and different operators used in c language.
CO7: To deal with Files stored on computer memory using File handling.

CA205-T - Communication Skill –II:
CO1: To demonstrate preparation and research skills for oral presentations.
CO2: To develop proper listening skills.
CO3: To articulate and enunciate words and sentences clearly and efficiently.
CO4: To show confidence and clarity in public speaking projects.
CO5: To demonstrate ability to gather information and apply it to persuade or articulate one's own point of view.

Goal Two: Written Communication
CO1: To understand the rules of spelling and grammar.
CO2: To read and analyze text and be able to summarize ideas in writing.
CO3: To organize thoughts in a manner that emphasizes flow and paragraph development.
CO4: To learn proper footnoting and bibliography skills.
CO5: To understand different writing techniques and styles based on the communication.

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medium being used.
CO6: To develop group communication skill
CO7: To develop listening Comprehension, reading Comprehension and Vocabulary.
CA206-T -Numerical Methods:
CO1: To demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.
CO2: To apply numerical methods to obtain approximate solutions to mathematical problems.
CO3: To derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations.
CO4: To analyze and evaluate the accuracy of common numerical methods.
CA207-P -Data Structure (LAB):
CO1: To understand the concept of Dynamic memory management, data types, algorithms, Big O notation.
CO2: To understand basic data structures such as arrays, linked lists, stacks and queues.
CO3: To describe the hash function and concepts of collision and its resolution methods.
CO4: To solve problem involving graphs, trees and heaps.
CO5: To apply algorithm for solving problems like sorting, searching, insertion and deletion of data.

CA208-P -I.T. Tools & Web Designing – I (LAB): A student will be able to
CO1: Explain the history of the internet and related internet concepts that are vital in understanding web development.
CO2: Discuss the insights of internet programming and implement complete application over the web.
CO3: Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.
CA209-P- C Programming – II (LAB):
The course will enable students to
CO1: Implement Programs with pointers and arrays, perform pointer arithmetic, and use the pre-processor.
CO2: Write programs that perform operations using derived data types.
CO3: Use of pointers and user defined data types.
CO4: Use of functions used in C language.
CA210-P - Numerical Method (LAB):
A student will be able to
CO1: Identify different mathematical problems and reformulate them in a way that is appropriate for numerical treatment.
CO2: Choose appropriate numerical method for treatment of the given problem.
CO3: Explain choice of method by accounting for advantages and limitations.
CO4: Choose an algorithm that implies efficient calculations and implement it in a programming language, suited for calculations e.g. C-language.
CO5: Estimate the reliability of the results.
CO6: Use functions from the programming language library for efficient calculations and visualization.
CO7: Apply computer science for the solution of practical problems.

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CA301-T - Database Management System:

CO1: To know about database system basic concepts, architecture, features, purpose, advantage of DBMS.

CO2: To learn about component of a DBMS: Users, facilities & structure.

CO3: To learning about data modeling & design.

CO4: To learn about entity-relationship data model.

CO5: To understanding about basics of relational model, normalization, relational algebra.

CO6: To introduce students to oracle s/w.

CA302-T - Mobile Maintenance -I:

CO1: To know about basic Electronics and Microcomputers.

CO2: To enable students to handle mobile phones with the knowledge of testing of batteries and battery charger.

CO3: To gain the knowledge of different mobile phones and also able to handles it.

CO4: To identify the different chips and crystals on the mobile PCB Board.

CO5: To get the brief knowledge of motherboard, different software for mobile repairing.

CA303-T - Principle of Management:

CO1: To understand basic concepts, scope and importance, evaluation of management.

CO2: To handle administrative section by thoroughly knowledge of work authority and responsibility.

CO3: To learn various function of management such as planning, organizing, staffing and so on.

CO4: To get additional knowledge of human factors in business administration and organization.

CO5: To enable students to control and coordinate with their colleagues.

CA304-T -Programming in CPP:

CO1: To acquire an understanding of basic object oriented concepts and the issues involved in effective class design.

CO3: To write C++ programs that use object oriented concepts such as information hiding, constructors, destructors, inheritance etc.

CA305-T - Personality Development:

CO1: To develop and exhibit and accurate sense of self.

CO2: To develop and nurture a deep understanding of personal motivation.

CO3: To develop an understanding of and practice personal and professional responsibility.

CO4: To learn to balance confidence with humility.

CO5: To identify, understand, and apply contemporary theories of leadership to a wide range of situations and interactions.

CO6: To develop and articulate a personal philosophy of leadership.

CO7: To understand concepts of democratic leadership and processes.

CA306-T -Statistical Method:

CO1: To prepare for competitive examinations.

CO2: To know application of statistics in real life.

CO3: To nderstand and to calculate various types of averages and variations.

CO4: To understand how to apply discrete & continuous probability distributions to various business problems.

CO5: To know how to organize, manage, and present data.

CO6: To carry out in these courses exercises or small projects that incorporate data

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presentation.
CO7: To demonstrate ability to write reports of the results of statistical analyses giving summaries and conclusions using nontechnical language.

CA307-P - Programming in C++ & aDBMS (LAB): A student will able to

CO1: Be familiar with using C++ functions and the concepts related to good modular design.
CO2: Be familiar with one-dimensional and two-dimensional arrays.
CO3: Be familiar with using C++ structures.
CO4: Be familiar with using pointers and reference parameters.
CO5: Be familiar with using text file input/output
CO6: Be familiar with C++ classes.
CO7: Explain the features of database management systems.
CO8: Design conceptual models of a database using ER modeling.
CO9: Understanding about basics of relational model, normalization, relational algebra.
CO10: Introduction to oracle s/w.

CA308P- Mobile Maintenance-I & SM using Excel (LAB): A student will be able

CO1: To understand the basic internal structure of mobile phones.
CO2: To learn how to connect the mobile chips and battery.
CO3: To explain different types of mobile phones with its IC"s.
CO4: To learn applications and security issues of mobile phones
CO5: To draw the different graphical representation of the raw data in statistical method using Excel.
CO6: To differentiate one graph with another graph.
CO7: To describe the quantitative results easily.
CO8: To handles every statistical functions of Excel.

CA401-T - Advance Database Management System:

CO1: Student will able to deal with database system using SQL to manipulate data.
CO2: Information about physical storage of data.
CO3: Knowledge about architecture of database system.
CO4: Learning about transaction processing and concurrency control.

CA402-T - Advance Mobile Repairing:

CO1: Student will get knowledge of Mobile Phone Technology.
CO2: Student will familiar with Micro chip and Microprocessor Technology.
CO3: Student will get practical training of handling various components of Mobile phone.
CO4: Learning of circuit diagram of Mobile phone with complete software installation.
CO5: Student able to find the fault in Hardware and Software and also able to read the track of mobile phone.

CA403-T - Software Project Management:

CO1: To manage the selection and initiation of individual projects and of portfolios of projects in the enterprise.
CO2: Implement processes for successful resource, communication, and risk and change management.
CO3: To conduct project planning activities that accurately forecast project costs, timelines, and quality.
CO4: To demonstrate effective project execution and control techniques that result in successful projects.
CO5: To conduct project closure activities and obtain formal project acceptance.

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CO6: To demonstrate a strong working knowledge of ethics and professional responsibility.
CO7: To demonstrate effective organizational leadership and change skills for managing projects, project teams, and stakeholders.

CA404-T - Core Java

CO1: To implement Object Oriented Programming Concepts.
CO2: To use and create packages and interfaces in a Java program
CO3: To use graphical user interface in Java programs.
CO4: To create applets.
CO5: To implement exception handling in Java.
CO6: To implement Multithreading.
CO7: To use Input/output Streams.
CO8: To handle security implementations in Java.
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CA405-T - Aptitude and Logical Reasoning:

CO1: To prepare for competitive examinations.
CO2: To evaluate critically various real life situations by resorting to Analysis of key issues and factors.
CO3: To read between the lines and understand various language structures.
CO4: To demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.

100 CA406-T - Linear Programming Problem:

CO1: To know various importance of Linear Programming Problem.
CO2: To understand various applications which were applied in different fields.
CO3: To define the LPP and formulate the LPP in general and graphical form.
CO4: To understand various methods of LPP such as Simplex method and duality method.
CO5: To learn transportation and assignment problems using simple steps.

CA407-T - Programming in Java &Adv. DBMS using SQL (LAB):

A student will able to
CO1: Get knowledge of the structure and model of the Java programming language, (knowledge)
CO2: Use the Java programming language for various programming technologies (understanding)
CO3: Evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements (analysis)
CO4: Propose the use of certain technologies by implementing them in the Java programming language to solve the given problem (synthesis)
CO5: Choose an engineering approach to solving problems, starting from the acquired knowledge of programming and knowledge of operating systems. (evaluation)
CO6: Define database system concepts and apply normalization to the database.
CO7: Explain the basic processing and optimization techniques for high level query.
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CO8: Describe different transaction processing concepts and use different concurrency control techniques.
CO9: Discuss different types of databases such as object oriented and distributed databases.
CO10: Identify different types of database failures and techniques to recover from such failures.
CO11: Discuss advanced database technologies and products used in enterprise

CA408-T - Mobile Maintenance-II & Mini project (LAB):

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A student will able to....

CO1: Know about various features of Mobile phones.
CO2: Handle every internal part of mobile.
CO3: Handle the different software"s of mobile phones.
CO4: Formulate a real world problem and develop its requirements.
CO5: Develop a design solution for a set of requirements.
CO6: Test and validate the conformance of the developed prototype against the original requirements of the problem.
CO7: Work as a responsible member and possibly a leader of a team in developing software solutions.
CO8: Express technical and behavioral ideas and thought in oral settings.
CO9: Prepare and conduct oral presentations
CO10: Self learn new tools, algorithms, and/or techniques that contribute to the software solution of the project.
CO11: Generate alternative solutions, compare them and select the optimum one.

Code: CA501-T - Software Project Management II:

CO1: To recognize, trace and resolve IT related crises using project management software.
CO2: To identify the impact of IT projects on the performance of the organizations.
CO3: To manage the phases and infrastructure of IT projects.
CO4: To develop strategies to calculate risk factors involved in IT projects.
CO5: To use project management software to control the design, implementation, closure, and evaluation of IT projects.
CO6: To estimate, plan, calculate, and adjust project variables.

CA502-T - Computer Graphics-I:

CO1: To learn basic concept in Computer Graphics which includes different input and output devices, Graphics file formats and so on.
CO2: To use different functions of Graphics for creating any object.
CO3: To be able to move an object from one place to another, rotate, scale, reflect the object easily.
CO4: To generate the character / alphabets using various methods.

CA503-T- Core Java-II:

CO1: To understand input/output stream used in java.
CO2: To learn different utilities in java language.
CO3: To have an overview of database access and details for managing information using the JDBC API.
CO4: To be able to write simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles.
CO5: To learning how to use Java applets to create interactive web programs: Fonts, color, graphics, and animation.
CO6: To learn how to use Java applets to create interactive web programs by sending and receiving parameters in an applet.

CA504-T- Data Warehousing:

CO1: To evaluate the different models of OLAP and data preprocessing.
CO2: To enlist various algorithms used in information analysis of Data Mining Techniques.
CO3: To demonstrate the knowledge retrieved through solving problems.

CA506-T - Data Communication & Networks

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CO1: To understand different types of networks, various topologies and application of networks.
CO2: To understand types of addresses, data communication.
CO3: To understand the concept of networking models, protocols, functionality of each layer.
CO4: To learn basic networking hardware and tools.
CO5: To understand wired and wireless networks, its types, functionality of layer.
CO6: To understand importance of network security and cryptography.

Course Code: CA507-T- Beginners Programming with PHP

CO1: To understand how server-side programming works on the web.
CO2: To learn PHP Basic syntax for variable types and calculations.
CO3: To create conditional structures.
CO4: To store data in arrays.
CO5: To use PHP built-in functions and creating custom functions.

CA509-P - Pr. Based on Comp. Graphics & Pr. Based on Core Java-II (LAB):

CO1: To study and make an object based on various graphical functions.
CO2: To learn how to draw different shapes using various algorithms such as line, circle.
CO3: To handle the various movements of an object for animation such as translate, rotate, scaling and reflection.
CO4: To have knowledge about Input/output Stream used in java.
CO5: To learn different utilities in java language.
CO6: To have an overview of database access and details for managing information using the JDBC API.
CO7: To be able to write simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles.
CO8: To learn use of Java applets to create interactive web programs: Fonts, color, graphics, and animation.
CO9: To learn use of Java applets to create interactive web programs by sending and receiving parameters in an Applet.

CA510-P -Pr. Based on DCN & Pr. Based on PHP (LAB):

CO1: To describe various standard network models.
CO2: To understand various guided transmission media.
CO3: To analyze error detection and error correction codes.
CO4: To understand the concepts behind medium access control sub layer.
CO5: To understand how server-side programming works on the web.
CO6: To learn PHP Basic syntax for variable types and calculations.
CO7: To create conditional structures.
CO8: To store data in arrays.
CO9: To use PHP built-in functions and creating custom functions.

CA601-T - Software Testing and Quality Assurance:

CO1: The student will be able to identify benefits of and the needs to enforce software quality.
CO2: The students will be able to differentiate between quality control, quality management and quality assurance.
CO3: The students will be able to discuss different software quality factors models.
CO4: Student learns systematic approach to the development, operation, maintenance, and retirement of software.
CO5: To understand methods and tools of testing and maintenance of software"s.

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CO6: Student learns how to use available resources to develop software, reduce cost of software and how to maintain quality of software.

CA602-T - Computer Graphics-II

CO1: Student will get knowledge of Three (3)-Dimensions (D) basic concept.

CO2: Students will be able to perform different operations on an object such as 3D-Rotation, Scaling and Translation.

CO3: Students can clip any object using various methods/algorithms.

CO4: To understand the curves and fractals concept.

CO5: To enable students to identify and describe different color model for defining any object.

CO6: To understands the concept of animation and can be implemented in real time application.

CA603-T- Java Server Pages (JSP)

CO1: Students get knowledge of Java server pages by its life cycle.

CO2: Studnets can learn different scripting tags.

CO3: To understand different tags which are helpful to the server pages such as directive tags, action tags and also depth knowledge of Java Beans.

CO4: To handle the Database Access to JSP page.

CO5: To get additional knowledge of JSTL, Core and XML tag library.

Code: CA604-T - Data Mining:

CO1: To build basic terminology.

CO2: To display a comprehensive understanding of different data mining tasks and the algorithms most appropriate for addressing them.

CO3: To evaluate models/algorithms with respect to their accuracy.

CO4: To demonstrate capacity to perform a self directed piece of practical work that requires the application of data mining techniques.

CO5: Critique the results of a data mining exercise.

CO6: To develop hypotheses based on the analysis of the results obtained and test them.

CO7: To understand a data mining solution to a practical problem.

CA606-T - Cloud computing:

CO1: Studnets learn cloud computing fundamentals with various cloud services.

CO2: Students learn different cloud computing technologies and its applications.

CO3: Students can understand key enabling technologies for virtual private clouds and its applications.

CO4: Students understand different role of networks in cloud computing.

CO5: Students learn architecture of cloud and additional information about data-intensive technologies with its characteristics and system architecture for cloud computing.

Course Code: CA607-T - Advanced Programming with PHP:

CO1: To maintain state using cookies, session variables, hidden form fields and query strings.

CO2: To use PHP to manipulate files

CO3: To identify and handle the types of errors that can occur when programming with PHP

CO4: To introduce to OOP (Object Oriented Programming) in PHP

CO5: To understand use of an object-oriented API to access SQL to SELECT, INSERT, UPDATE and DELETE data from tables.

CO6: Using the phpMyAdmin utility to administer the MySQL database.

CO7: Using OOP in PHP to define and use classes.

Code: CA609-P - Pr. Based on PHP & JSP (LAB)

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CO1: To identify and handle the types of errors that can occur when programming with PHP
CO2: To ntroduce to OOP (Object Oriented Programming) in PHP
CO3: To use an object-oriented API to access SQL to SELECT, INSERT, UPDATE and DELETE data from tables
CO4: To use the php MyAdmin utility to administer the MySQL database
CO5: To use OOP in PHP to define and use classes.
CO6: To choose an engineering approach to solving problems, starting from the acquired knowledge of programming and knowledge of operating systems. (Evaluation)
CO7: To implement the program using various action tags in JSP.
CO8: To understand scripting tags manipulations.
CO9: To learn JSP & Java Beans.
CO10: To study session API in JSP
CO11: To understand database access to JSP page.
CO12: To study SQL tagged library and function tag library in JSP.

CA610P - Major Project:

CO1: To formulate a real world problem and develop its requirements.
CO2: To develop a design solution for a set of requirements.
CO3: To test and validate the conformance of the developed prototype against the original requirements of the problem.
CO4: To work as a responsible member and possibly a leader of a team in developing software solutions.
CO5: To express technical and behavioral ideas and thought in oral settings.
CO6: To participate in and possibly moderate, discussions that lead to making decisions.
CO8: To express technical ideas, strategies and methodologies in written form.
CO9: To prepare and conduct oral presentations.
CO10: To learn new tools, algorithms, and/or techniques that contributes to the software solution
of the project.
CO11: To generate alternative solutions, compare them and select the optimum one.

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Programm out come's and Course out come's 2.6.1& 2.6.2

New Syllabus on NET 2024-25

B.A. I year – I Semester - Programm out come's and Course out come's

Common Subjects

Ist semester	2nd semester
	AEC2-Engish
VEC-English,	VEC-Constitution of India,
CC- Health and Wellness	CC-Yoga Education sport fitness

B.A.

B.A.	B.A. I year – Semester I POS, COS,	B.A. I year – Semester II POS, COS,
Marathi	B.A. I year -Marathi (Opt.) Translated in English also	
Marathi DSC1,4	DSC.1-Major 1 Mandatory (Core) M1.Sahitya Prakaracha Abhyas-Adhunik Kavita, १) आधुनिक कवितेचे स्वरूप समजून घेता येईल. २) आधुनिक कवितेच्या प्रकारांचे आकलन होण्यास मदत होईल. ३) निवडक आधुनिक कवितेतीलः आशयसूत्र व भाषा यातील विविध घटकांचा उलगडा करता येईल. ४) निवडक आधुनिक कवितेतील जाणिवा समजून घेता येतील. 1) One can understand the nature of modern poetry. 2) It will help to understand the types of modern poetry. 3) In selected modern poetry: various elements of content and language can be deciphered.	DSC.4-Major 1 Mandatory (Core) M4.Sahitya Prakaracha Abhyag.Katha, १. कथेचे स्वरूप व घटक समजून घेता येतील, २. कथेच्या विविध प्रकारांचे आकलन होण्यास मदत होईल. ३. कथेचे आशयसूत्र व भाषा यातील विविध घटकांचा उलगडा करता येईल. ४. कथेच्या कथानकाची जडणघडण घटना प्रसंगाच्या आधारे कशी होते ते समजून घेता येईल. ५. कथेतील जाणिवा समजून घेता येईल. 1. Understand the structure and elements of a story, 2. It will help in understanding the different types of story. 3. Various elements can be deciphered in the content and language of the

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	4) One can understand the sensibilities of selected modern poetry.	story. 4. One can understand how the plot of the story is structured based on the events. 5. The feeling in the story can be understood.
Marathi GE OE	GE/OE-Soundarya Mulya ani Bhashik Kaushalya- bhag -1, १. निवडक कलाकृतीचा अभ्यास करण्यास मदत होईल. २. निवडक कलाकृतीच्या माध्यमातून सौंदर्यमूल्य उलगडून दाखवता येईल. ३. भाषिक कौशल्याच्या दृष्टीने क्षमता विकसित होण्यास मदत होईल. ४. वक्तृत्वाच्या माध्यमातून रोजगारनिर्मिती या अनुषंगाने विचार करता येईल, 1. Studying selected works of art will help. 2. Aesthetic value can be revealed through selected artwork. 3. It will help to develop competence in terms of linguistic skills. 4. Employment creation through rhetoric can be considered in line with,	GE/OE-Soundarya Mulya ani Bhashik Kaushalya- bhag -2, १. निवडक कलाकृतीचा अभ्यास करण्यास मदत होईल. २. निवडक कलाकृतीच्या माध्यमातून सौंदर्यमूल्य उलगडून दाखवता येईल. ३. साहित्य कलाकृतीतील जीवनमूल्य आत्मसात होण्यास मदत होईल. ४. जाहिरातीचे तंत्र व कौशल्य आत्मसात करता येतील. ५. रोजगाराभिमुखतेच्या दृष्टिकोनातून जाहिरात लेखनाचे महत्त्व प्रतिपादन करता येईल. 1. Studying selected works of art will help. 2. Aesthetic value can be revealed through selected artwork. 3. It will help to imbibe the life value in literary works of art. 4. Techniques and skills of advertising can be acquired. 5. The importance of advertisement writing can be asserted from the point of view of employment orientation.
Marathi SEC VSC	SEC-Samaj Madhyamawaril Lekhan, AEC-, IKS-, CC,- १. समाज माध्यमांचा परिचय करून घेण्यास मदत होईल. २. समाज माध्यमांवरील लेखनाचे तंत्र व कौशल्य आत्मसात करण्यास मदत होईल. ३. समाज माध्यमांवरील लेखन व त्यातून	VSC-Chitrapat Parikshan, १. चित्रपटाचे वाङ्मयीन मूल्य लक्षात घेता येईल. २. चित्रपटाचे नाट्यमूल्य व चित्रपटमूल्य यावर प्रकाश टाकता येईल. ३. चित्रपट परीक्षणाचे तंत्र व कौशल्य अवगत होण्यास मदत होईल.

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Programm out come's and Course out come's 2.6.1& 2.6.2

	रोजगारनिर्मिती या विषयीचे ज्ञान मिळविण्यास मदत होईल. 1. Getting familiar with social media will help. 2. It will help to acquire the technique and skill of writing on social media. 3. It will help to gain knowledge about writing on social media and creating employment from it.	४. प्राप्त कौशल्याच्या आधारे विद्यार्थ्यांना रोजगाराभिमुख बनवता येईल. 1. The literary value of the film can be considered. 2. The theatrical value and film value of the film can be highlighted. 3. It will help to know the techniques and skills of film screening. 4. Students can be made employable based on the acquired skills.
		AEC-Jahiratlekhan Rajgarsandhi, १. जाहिरातीचे स्वरूप लक्षात घेण्यास मदत होईल. २. जाहिरातीचे तंत्र समजून घेण्यास मदत होईल. ३. जाहिरातीचे प्रकार सांगता येतील. ४. जाहिरात लेखन कौशल्य आत्मसात करून रोजगार मिळविण्यास उपयुक्त होईल. 1. It will help to notice the nature of the advertisement. 2. It will help to understand the techniques of advertising. 3. Types of advertisement can be mentioned. 4. Acquiring advertisement writing skills will be helpful in getting employment.
Hindi	B.A. I year Hindi (Opt.) Translated in English also	Hindi (Opt.)
Hindi POs	पाठ्यक्रम परिणाम (Programme Specific Outcome) • मानवीय भावना और संवेदना को संवर्धित और संरक्षित किया जा सकेगा। • सामाजिक मूल्यों को बढ़ावा देकर राष्ट्रीय चेतना की प्रबलता दिखाई देगी। • छात्रों में अभिव्यक्ति कौशल और साहित्य के संस्कारों का बीजारोपण होगा। • छात्रों में व्यक्तित्व विकास, संवाद कौशल और नेतृत्व के गुण परिलक्षित होंगे।	

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- पाठ्यक्रम से समरसता और विश्व शांति के लिए सामाजिक समर्थन बढ़ेगा।
- छात्रों में परिवेश की समझ और मंचीय कला का प्रभाव देखा जा सकेगा।
- छात्र रोजगार की अनेक संभावनाएँ की तलाश करने में सक्षम बनेंगे।
- छात्रों में अकादमिक और सांस्कृतिक जागरूकता की वृद्धि होगी।
- हिंदी की टंकण व्यवस्था और साहित्य सृजन का कौशल सीख पाएंगे।
- साहित्य की सभी विधाओं से छात्र भली-भाँति परिचित हो पाएंगे।
- पर्यावरण और विज्ञान के संबंध में ज्ञान बढ़ाने से संतुलन को बनाए रखने में मदद मिलेगी।
- छात्रों में अनुसंधानात्मक एवं वैज्ञानिक दृष्टिकोण निर्माण होगा।
- विभिन्न प्रतियोगितात्मक परीक्षा संबंधी बुनियादी ज्ञान प्राप्त होगा।
- छात्र चिंतन, विवेचन और मूल्यांकन से संबंधित विभिन्न संदर्भों को जान सकेंगे।
- साहित्य और सिनेमा के माध्यम से छात्र विभिन्न सामाजिक विषय, समस्या एवं जटिलताओं को प्रभावी रूप से समझेंगे।

Program Specific Outcome (translated in English)

- Human emotions and sentiments can be enhanced and preserved.
- By promoting social values, national consciousness will become stronger.
- The seeds of expression skills and literary values will be sown in the students.
- Personality development, communication skills and leadership qualities will be reflected in the students.
- The course will increase social support for harmony and world peace.
- The understanding of the environment and the influence of stage art will be visible among the students.
- Students will be able to explore various employment opportunities.
- Academic and cultural awareness will increase among students.
- You will be able to learn the typing system of Hindi and the skill of literary creation.
- Students will be able to become well acquainted with all the genres of literature.
- Increasing knowledge regarding environment and science will help in maintaining the balance.
- Research and scientific outlook will be developed in the students.
- You will get basic knowledge related to various competitive examinations.
- Students will be able to know various contexts related to thinking, reasoning and evaluation.
- Through literature and cinema, students will effectively understand various social issues, problems and complexities.

Hindi CO DSC1. 4	DSC.1-Major 1 Mandatory (Core) M1.Hindi Katha Sahitya, पाठ्यक्रम का उद्देश्य (Objective) हिंदी कहानी साहित्य परंपरा से परिचय कराना।	DSC.4-Major 1 Mandatory (Core) M4.Hindi Natya Sahitya, पाठ्यक्रम का उद्देश्य (Objective) हिंदी नाटक विधा से छात्रों को अवगत कराना।

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	साहित्य, संवेदना का विकास कराना । विविध साहित्यिक विमर्शों से छात्रों को अवगत कराना । छात्रों में भावनात्मक एवं चारित्रिक गुणों को विकसित कराना । पाठ्यक्रम के परिणाम (Course Learning Outcomes) छात्रों को हिंदी कहानी विधा का सम्यक ज्ञान प्राप्त होगा । निर्धारित पाठ्यक्रम के पठन से छात्रों में भावनात्मक और संवेदनात्मक गुणों का निर्माण होगा । पाठ्यक्रम के अध्ययन से छात्रों में लेखन और सम्यक दृष्टी का विवेक उत्पन्न होगा। पाठ्यक्रम में अन्तर्निहित जीवन मूल्यों से जुड़कर छात्र अपने नैतिक और चारित्रिक गुणों का विकास करने में सक्षम होंगे । छात्रों में कथा लेखन की क्षमता निर्माण होगी । Objective of the syllabus To introduce to the Hindi story literature tradition. To develop literature and sensitivity. To make students aware of various literary discussions. To develop emotional and character qualities in students. Course Learning Outcomes Students will get proper knowledge of Hindi story genre. Studying the prescribed syllabus will develop emotional and sensitive qualities in the students. Study of the syllabus will develop in the students the wisdom of writing and proper vision. Students will be able to develop their moral and character qualities by connecting with the life values	रंगमच और अभिनय कला से छात्रों को अवगत कराना । देशकाल और परिवेश से परिचित कराना । मानव जीवन की विभिन्न परिस्थितियों एवं विभिन्न मानसिक अवस्थाओं से छात्रों को परिचित कराना । मानवता के भाव को प्रस्थापित करना । छात्रों में राजनीतिक जागरुकता निर्माण करना । छात्रों में भावनात्मक एवं चारित्रिक गुणों को विकसित करना । पाठ्यक्रम के परिणाम (Course Learning Outcomes) छात्रों को हिंदी नाटक विधा का सम्यक ज्ञान प्राप्त होगा । नाटक से छात्रों को भावनाओं, संचार कौशल, और रचनात्मक अभिव्यक्ति का निर्माण होगा। नाट्य विधा के अध्ययन से छात्रों में लेखन और सम्यक दृष्टि का विवेक उत्पन्न होगा। नाटक की गतिविधियों से छात्रों के बोलने, सुनने, और समझने के कौशल में भी सुधार होगा । छात्रों में नाट्य लेखन की क्षमता निर्माण होगी। निर्धारित नाटकों के पठन से छात्रों में नाटक एवं रंगमच के प्रति अभिरूचि निर्माण होगी । Objective of the syllabus To make students aware of Hindi drama genre. To make students aware of the art of theatre and acting. To acquaint with the place, time and environment. To make the students aware of the different situations and mental states of human life

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	embedded in the curriculum. Students will develop the ability to write stories.	To introduce. To establish the sense of humanity. To create political awareness among students. To develop emotional and character qualities in students. Course Learning Outcomes Students will get proper knowledge of Hindi drama genre. Drama will help students build emotions, communication skills, and creative expression. The study of dramatic genre will develop in the students the wisdom of writing and proper vision. Drama activities will also improve students' speaking, listening, and comprehension skills. The students will develop the ability of play writing. Reading the prescribed plays will create interest in drama and theatre amongst the students.
Hindi GE OE	GE/OE-Hindi Sinema Aur Sahitya, पाठ्यक्रम का उद्देश्य : (Objective) हिंदी साहित्य और सिनेमा के अंतःसंबंध से विद्यार्थियों को परिचित कराना। विद्यार्थियों को सिनेमा की विषयवस्तु एवं तकनीकी पक्ष से परिचित कराना। साहित्य और सिनेमा में निहित जीवनोपयोगी उपदेश देने की क्षमता का विकास करना। सिनेमा के माध्यम से विद्यार्थियों को भारतीय समाज के यथार्थ से परिचित कराना। पाठ्यक्रम के परिणाम (Course Learning Outcomes) इस पाठ्यक्रम के अध्ययन से विद्यार्थी हिंदी सिनेमा, अपने समाज की परिस्थितियों को	GE/OE-Hindi Ki Rashtriya Kavyadhara, पाठ्यक्रम का उद्देश्य (Objective) राष्ट्रीय काव्यधारा की अवधारणा एवं स्वरूप का अध्ययन कराना। भारतीय स्वाधीनता आंदोलन के इतिहास की पहचान कराना। भारतीय साहित्यकारों के राष्ट्रीय योगदान का अध्ययन कराना। राष्ट्रीय स्वाभिमान और देश प्रेम को जागृत कराना। पाठ्यक्रम के परिणाम (Course Learning Outcomes) छात्र स्वाधीनता आंदोलन के इतिहास को

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	सरलता से समझेंगे। विद्यार्थियों में साहित्य और सिनेमा को देखने का आलोचनात्मक दृष्टिकोण विकसित होगा। विद्यार्थियों में भावात्मक रूप से अधिक संवेदनशीलता का भाव निर्माण होने में मदत मिलेगी विद्यार्थियों को व्यक्तिगत जीवन में नैराश्य को छोड़कर यश प्राप्ति के लिए प्रेरणा मिलेगी। Objective of the course: To introduce students to the interrelationship between Hindi literature and cinema. To introduce students to the subject matter and technical aspects of cinema. To develop the ability to impart useful life lessons contained in literature and cinema. To acquaint students with the reality of Indian society through cinema. Course Learning Outcomes By studying this course, students will understand Hindi cinema, the conditions of their society. You will understand it easily. Students will develop a critical approach to literature and cinema. It will help in developing greater emotional sensitivity in students Students will get inspiration to leave despair in personal life and achieve success.	समझेंगे। छात्र स्वाधीनता आंदोलन में साहित्य के योगदान को समझेंगे। छात्रों में राष्ट्रीय एकता का भाव निर्माण होगा। छात्रों में देशभक्ति और देश के प्रति स्वाभिमान का भाव निर्माण होगा। Objective of the syllabus To study the concept and form of national poetry. To identify the history of Indian independence movement. To study the national contribution of Indian litterateurs. To awaken national pride and patriotism. Course Learning Outcomes Students will understand the history of the freedom movement. Students will understand the contribution of literature in the freedom movement. A feeling of national unity will be developed among the students. A feeling of patriotism and self-respect towards the country will be developed among the students.
Hindi SEC VSC	SEC-Sambhashan Kaushalya, पाठ्यक्रम का उद्देश्य : (Objective) हिंदी साहित्य और सिनेमा के अंत:संबंध से विद्यार्थियों को परिचित कराना। विद्यार्थियों को सिनेमा की विषयवस्तु एवं तकनीकी पक्ष से परिचित कराना।	VSC-Rachanatmak Lekhan Kaushalya, पाठ्यक्रम का उद्देश्य (Objective) रचनात्मक लेखन के विविध रूपों से परिचय कराना ।

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साहित्य और सिनेमा में निहित जीवनोपयोगी उपदेश देने की क्षमता का विकास करना।	छात्रों में रचना तथा भाषा कौशल का विकास कराना।
सिनेमा के माध्यम से विद्यार्थियों को भारतीय समाज के यथार्थ से परिचित कराना।	छात्रों में सृजनात्मक चिंतन और लेखन क्षमता का विकास कराना।
पाठ्यक्रम के परिणाम (Course Learning Outcomes)	भाव तथा विचारों का प्रभावी प्रस्तुतीकरण कराना।
इस पाठ्यक्रम के अध्ययन से विद्यार्थी हिंदी सिनेमा, अपने समाज की परिस्थितियों को	पाठ्यक्रम के परिणाम (Course Learning Outcomes)
सरलता से समझेंगे।	
विद्यार्थियों में साहित्य और सिनेमा को देखने का आलोचनात्मक दृष्टिकोण विकसित होगा।	इस पाठ्यक्रम के अध्ययन-अध्यापन तथा प्रायोगिक कार्य के पश्चात् छात्रों में सृजनामक चिंतन, लेखन, भावाभिव्यक्ति और प्रस्तुतीकरण कौशल का विकास होगा।
विद्यार्थियों में भावात्मक रूप से अधिक संवेदनशीलता का भाव निर्माण होने में मदत मिलेगी	छात्रों में अपने परिवेश तथा समाज के प्रति संवेदनशीलता का विकास होगा।
विद्यार्थियों को व्यक्तिगत जीवन में नैराश्य को छोड़कर यश प्राप्ति के लिए प्रेरणा मिलेगी।	Objective of the syllabus
Objective of the course:	To introduce various forms of creative writing.
To introduce students to the interrelationship between Hindi literature and cinema.	To develop composition and language skills in students.
To introduce students to the subject matter and technical aspects of cinema.	To develop creative thinking and writing skills in students.
To develop the ability to impart useful life lessons contained in literature and cinema.	To effectively present ideas and thoughts.
To acquaint students with the reality of Indian society through cinema.	Course Learning Outcomes
Course Learning Outcomes	After the study, teaching and practical work of this course, the students will develop creative thinking, writing, expression and presentation skills.
By studying this course, students will understand Hindi cinema, the conditions of their society.	Students will develop sensitivity towards their surroundings and society.
You will understand it easily.	
Students will develop a critical approach to literature and cinema.	
It will help in developing greater emotional sensitivity in students	
Students will get inspiration to leave despair in personal life and achieve	

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	success.	
		AEC-Vyaktigat Vikas aur Jeevan Kaushalya,
	B.A. English	
English PO	B.A. I year English (Opt.) PROGRAM SPECIFIC OUTCOMES: The undergraduate program in English aims to 1. Sensitize students to the aesthetic, cultural and social aspects of literature 2. Provide students with extensive view of social, political, cultural and other aspects of society as reflected in literature 3. Acquire life and communication skills and focus on vocational skills 4. Learn to appreciate creative art and literature 5. Develop students' abilities like creative thinking and writing 6. Engage students with major genres of literature and develop fundamental skills required for close reading and critical thinking of the text and context 7. Acquire in-depth knowledge of the religious, socio-intellectual and cultural thoughts through literature 8. Create holistic approach towards education 9. Develop knowledge competence in select thrust areas that would provide directions to the students in terms of research as well as career options 10. Develop a sense of inquiry and capability among students for asking relevant/appropriate questions, problem solving, synthesizing and articulating 11. Create atmosphere of research and motivate students to undertake research in humanities 12. Encourage multidisciplinary research 13. Provide job opportunities through skill-based courses 14. Understand and recognised value system, moral dimensions and self responsibility for nation and society.	
English	Course Outcomes	
English DSC1, 4	DSC.1-Major 1 (Core) M1.English Poetry, Learning objectives:	DSC.4-Major 1 (Core) M4.English Drama, Course Objectives

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	• The nature and function of English poetry • The use of poetic devices • Use of diction, language etc. • Creative and critical response of learners towards English poetry Course Outcomes: By the end of course, the students will learn • Meaning of Poetry, its types and forms • The rise and development of English Poetry, trends in English poetry • Major and minor British poets, texts and contexts. • Reflection of human values in English poetry • Undertake projects, research in English poetry • Write poetry on current situations	• To introduce students to drama and its use in life • To understand life through English plays and theatre Course Outcomes: At the end of course, students will learn • Meaning and elements of English drama • Various trends in English drama • To demonstrate a broad knowledge of major and minor British playwrights and texts and contexts • Will play various roles in drama/theatre • Will write dramas
English GE OE	GE/OE-Functional English, Course Objectives: • Use of basic grammar in English language • Prepare for writing skills Course Outcome: By the end of course, the students will learn • Basic grammar in English language. • Writing skills with the help of clause elements, phrases, clause types, sentences types. • To prepare for various competitive examinations.	GE/OE-English for Competitive Examinations Course Outcome: At the end of course, the students will learn • The use of basic grammar in English language learning. • To prepare for various competitive examinations. • To spot common errors, sentence improvement, build vocabulary, selecting proper words, subject-verb concord, Ordering of words in sentences etc. • To enable students for employment with requisite professional skills,

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	• To spot common errors, sentence improvement, build vocabulary, selecting proper words, subject-verb concord, ordering of words in sentences etc.	ethics and values.
English SEC VSC	SEC-A. Metalinguistic Skills, Course Outcomes: At the end of the course, the student can understand • Acts of writing, the ability to think grammatically and to reflect on the effectiveness of language choices • Phonemic awareness, syntactic awareness, and lexical awareness • Conversational interaction and the role of metalinguistic skills • understand the intended message of the speaker through metalinguistic skills • Relation between language and culture	VSC-A. Translation in Practice, B. Business English, Course Outcomes: At the end of course, the students will learn • Translation as important branch of study and what is good translation. • Basic but valuable techniques used by a good translator in the translation between English and Marathi or English and Hindi. • To understand the idea, style and tone of the writer, the historical and cultural context of the writing, as well as the explicit and implied meanings of words, the grammatical structures of sentences, and the logic of sentences and paragraphs in order to achieve faithfulness, expressiveness, and elegance in the translation. • What makes a qualified professional translator and acquire the abilities and skills that such a translator needs
	AEC-Communication Skills in English Course Outcome: At the end of course, students will learn • To communication skills, importance of all skills and use of effective communication skills. • To speak at public places. • To prepare for job interview	AEC-Soft Skills in English, Course Objectives: • To equip the students with the skills to effectively communicate in English • To teach the students practical, everyday communication in English through innovative teaching methods

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	• Manners, etiquettes, and maintain good relations with others • To show higher level of critical thinking and sharpen their accuracy in writing.	• To train the students in interview skills, group discussions and presentation skills • To expose the students to other important skills such and computing and programming • To motivate the students to develop confidence Course Outcomes: At the end of course, the students will learn • Soft skills and communication skills • Useful tips for personality development • Manners and etiquettes at virtual communication • Skills useful in corporate jobs • To develop critical thinking
Economics	B.A. I year Economics	
Economics POs	B. A. Programme Outcomes (POs): Upon completion of this programme, a student will be able to analyse government policies. Knowing how an economy functions, and how decisions are made by consumers, producers, and regulators, the student will have the necessary skills to identify, analyse, and solve problems in a logical and efficient way. PO1: The students will get trained to collect primary data and presentation skills. PO2: The program also empowers the graduates to understand various competitive examinations or choose the post graduate programme of their choice. PO3: The students will get knowledge with human values framing the base to deal with various problems in life with courage and humanity.	

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	PO4: The students will get an understanding of basic economic theory. PO5: The students will get an introduction to economic issues and problems facing the country. Programme Specific Outcomes for B. A. Economics: After completion of the B. A. Economics programme, the students should be able to: PSO1: Students will be able to explain the basic and core terms, concepts and theories in Economics. PSO2: Students will be able to Use the acquired knowledge and skills in taking up higher studies. PSO3: Students will able to apply economic reasoning to solve the problems of the economy. PSO4: Students will able to evaluate substantive knowledge of core areas in Economics and the ability to think critically about them. PSO5: Students will able to analyze history of the discipline of Economics.	
Economics COs DSC1, 4	DSC.1-Major 1 Mandatory (Core) M1-Micro Economics (Credits = 2 - T + 2 - P), Learning Objectives of the Course: i) Introduce the basic principles of Micro Economics to students.. ii) To analyze and interpret charts, graphs and figures. iii) To develop an understanding the basic theories of micro economics and their application. iv) To demonstrate the theories discussed in class will usually be applied related to real life situations. v) To enable students to understand how optimum real life decisions are taken by individuals under situations of scarcity. Course Outcomes (COs) : After completion of the course, students will be able to - i) Students will be able to analyse about	DSC.4-Major 1 Mandatory (Core) M4-Price Theory, Learning Objectives of the Course : i) To enable students to understand how optimum real life decisions are taken by firms under situations of scarcity. ii) To introduce basic concepts of price theory. iii) To create awareness about different types of markets. iv) To state and explain meaning of different costs. v) To understand internal and external economies & diseconomies. Course Outcomes (COs) : After completion of the course, students will be able to - i) Students will be able to analyse theory of production.

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	meaning, nature, scope, significance and limitations of micro economics. ii) Students will be able to analyse demand and supply analysis. iii) Students will be able to understand the consumer behaviour. iv) Students will be able to develop strong conceptual knowledge of the subject. v) Students will be able to examine welfare economics	ii) Students will be able to compare costs and revenue. iii) Students will be able to examine market. iv) Students will be able to describe various concepts in production and costs. v) Students will be able to analyze selling cost.
Economics GE OE	GE/OE-Indian Banking System, Learning Objectives of the Course: i) Introduce Indian Banking Structure. ii) To create awareness about role of commercial banks. iii) To understand about the function of banks. iv) To understand importance of co-operative banks. v) To understand development of banks. Course Outcomes (COs) : After completion of the course, students will be able to - i) Students will be able to describe NABARD. ii) Students will be able to understand Indian banking structure. iii) Students will be able to analyse functions of commercial banks. iv) Students will be able to analyse functions of Co-operative banks. v) Students will be able to examine role of banking in development.	GE/OE-Reserve Bank of India and Monetary Policy, Learning Objectives of the Course: i) Provide knowledge to the student regarding RBI and monetary policy. ii) Introduce to students different methods of credit control. iii) Enable to student study the money measures. iv) Understand the role and functioning of RBI v) To introduce current monetary policy. Course Outcomes (COs) : After completion of the course, students will be able to - i) Students will be able to analyse about money measures. ii) Students will be able to understand the function of RBI. iii) Students will be able to examine monetary policy. iv) Students will be able to describe methods of credit control.

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		v) Students will be able to describe current monetary policy.
Economics SEC VSC	SEC1-Data Collection, Learning Objectives of the Course: i) To understand the various data collection techniques in economics. ii) To provide knowledge of data collection. iii) To develop practical skills. iv) To develop communication skills. v) To prepare research activity. Course Outcomes (COs) : After completion of the course, students will be able to - i) Students will be able to analyse primary data collection methods. ii) Students will be able to describe secondary data collection methods. iii) Students will be able to examine questionnaires and schedule. iv) Students will be able to differentiate between primary and secondary data. v) Students will be able to practical skills related to data collection.	VSC-Modern Banking Techniques, Learning Objectives of the Course: i) To create awareness about modern banking techniques. ii) To understand E - Banking. iii) The approach of this paper is to study of cyber security. iv) To develop practical skills. v) To aware about fraud. Course Outcomes (COs) : After completion of the course, students will be able to - i) Students will be able to describe the need and importance of technology in banking. ii) Students will be able to understand E- Banking and Digital Payments. iii) Students will be able to examine cyber security. iv) Students will be able to understand security measures. v) Students will be able to practical skills.
	CC-Health and Wellness,	
Political Science	B.A. I year Political Science	
Political Science Cos DSC1, 4	DSC.1-Major 1 Mandatory (Core) M1-Introduction to Political Science, Course Objective: This paper aims to provide students a sound understanding of political science, including various approaches, ideological perspectives	DSC.4-Major 1 Mandatory (Core) M4-Government and Politics in Maharashtra, Course Objective: This course is introduced to students with the aim to provide in-depth knowledge about the formation,

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	and relationship with other Social Sciences. Acknowledging the importance of state in the contemporary political discourses, the students will be able to comprehend the function of the state in society and how it rules and regulates the power structure by learning various theories of origin and functioning of the state. Learners would be able to describe and comprehend various key concepts related to the discipline and develop their own understanding of politics. They will understand what power is and how it functions in society and politics. They will be able to explain various theories of Justice. They will learn to comprehend and explain various theories and contemporary debates in democracy. Also, they will come to know how liberal and Marxist traditions look at and understand politics today Learning Outcome: At the end of the course the students would be able to understand – Theoretical aspects of Political Science, and will learn about its basic concepts state and government The origin, structure and functioning of state and government. Understand the dynamics of live politics in the context of political theory Basic concepts – liberty, equality, and	reorganization of Maharashtra state and make them aware about socio-political legacy of Maharashtra, as well as to cater better understanding of structure and functioning of the state, state politics and democratic decentralization through the study of local self governance . Leaning Outcomes: with the study of this course student will be able to 1. Understand the socio-economic conditions, State reorganization and cultural background of Maharashtra 2. Make sense about structure and functioning of Government of Maharashtra 3. Analyze political dynamics of Maharashtra 4. Become aware of Local self government and Panchayat Raj in Maharashtra

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	justice Distinctions and relevance of these concepts.	
Political Science GE Oe	GE/OE-Basics of State and Government, Course Objective: To know the basics of the state and government, it may help students to understand his socio political life and responsibilities. This course is also having a broad line perspective and objective to increase awareness of an individual as a citizen of a state, towards the institutions and system of governance of society. The main aim of this course is to cater general knowledge and information to student about the structure and functioning of the state and government. Course Learning Outcomes: At the end of the course, students will be able to: • Understand origin, constituents, purpose, structure and functioning of the state and government. • Analyze the better form of government around the world. • To understand the difference between state and government.	GE/OE-Introduction to Foreign Policy, Course Objective: The objectives of this course are to: o Introduce students to the mechanics of foreign policy making. o Identify the issues that influence the policy in order for them to develop a perspective on the emerging trends in Indian foreign policy o The object of the course is to introduce the students to the traditions in Indian foreign policy which have defined the nation"s strategic approaches to myriad themes and shaped and conditioned its perspectives in terms of national interest. o Introduce the student genre to the changing contours of Indian foreign policy through the 21st century Course Learning Outcomes: At the end of the course, students will be able to: • To study the framing, means and goals of foreign policy. • To understand the objectives and principles of India"s foreign policy.
Political Science SEC VSc	SEC1-Human Rights, Course Objective: This course is aiming to enhance students understanding, sensibility and	VSC-Election Management, Course Objective This paper attempts to discuss about principles, structure, debate and

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	skill to identify ultimate catastrophes and violations of human rights and analyze it to reach at substantial remedial suggestion. Learning Outcomes: After completing this course students will be able to- 1. Explain the basic concept of Human Rights and its various formulations. 2. Have sufficient knowledge and skills for analyzing, interpreting, and applying the Human Rights Standards and sensitize them to the issues. 3. Develop ability to critically analyze Human Rights violations around them and become a volunteer.	practices of election management. It provides the vocational skill and basics of electoral services. This course may create employment opportunities for students. Course Outcome- This Course will make students able to 1. Acquire skills of election management. 2. Assist political parties or candidates to manage its electorate. 3. Provide Professional solutions to run election campaign to political party or any independent candidate.
Sociology	B.A. I year Sociology	
Sociology POs	On completion of the 03/04years Degree in Sociology students will be able to- PSO1: Students will get to know 'Sociology' as discipline and will understand the meaning and Scope of the subject in branch of Humanities PSO2: Understanding of Concepts and sociological theories to explore and understand society and social phenomenon in general PSO.3: Create ability to understand and interpret social change along with factors responsible for it and its implications to the society and Individual PSO.4: Knowledge of research methodology tools and it use of solving social problems and further its use in Social Policies. PSO.5: Learning use of sociology and its application in understating of contemporary social problems in the interest of society. PSO.6: providing information and knowledge of various fields and subfields of sociology and its interrelation for helping students in the study of society. PSO.7: Encourage critical thinking of emerging issues, implications of dynamic society, providing ability to encounter with existing social issues.	
Sociology Cos DSC1, 4	DSC.1-Major 1 Mandatory (Core) M1-Introduction to sociology, Learning Objectives of the course: i) To provide knowledge about Sociology as subject and relation to	DSC.4-Major 1 Mandatory (Core) M4-Applied Sociology, Course Description: This course offers an introduction to the applied sociology, focusing on the

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	other social science ii) To provide knowledge regarding development of social thought and emergence of Sociology iii) To familiarize with Pioneer Sociologists and their brief contribution to Sociology iv) To introduce Indian Sociologists to have ideological perspective v) To explore basic concepts of Sociology Course Outcomes (COS) i) Students will understand the period of renaissance and its significance in the development of social thought. ii) Students will understand the major contributions and theories of pioneer sociologists. iii) Students will able to define sociology through a scientific lens. iv) Students will get introduction of Indian sociologists and their contribution v) Students will acquaint with basic concepts of Sociology	meaning and characteristics of applied sociology and its role in understanding the social problems.policy making and social development. It describes the importance of sociology in the society. The course emphasizes the applied aspect of sociology. Course Objectives: 1. To introduce students to the concept, scope and importance of applied sociology. 2. To examine the role of sociology in understanding the social problems and solving of it. 3. To understand the role of sociology in policy framing. 4. To analyze the role of applied sociology in social development. 5. To explore the importance of sociology in social research.
Sociology GE OE	GE/OE-Social Media and Society, Learning Objectives of the course: i) To explore the relation between social media and Society. ii) To get understanding of different types of social media and various applications iii) To assess positive as well as negative impacts of social media on society in and on individuals iv) To make awareness about the challenges and concerns of the social media, it use and impact	GE/OE-Sociology of Cinema, Course Description: This course introduces students to the sociological study of cinema, exploring how films reflect, shape, and influence society. It examines the relationship between cinema and social norms, values, and identities, as well as the role of films in cultural and social change. The course emphasizes contemporary issues and case studies, particularly focusing on Indian cinema. Course Objectives:

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	v) To know the effects of social media and society Course Outcomes (COs): i) Students will understand the meaning and nature of social media. ii) Students will able to identify and describe the functions of social media platforms, recognizing their roles in information dissemination, community building, and entertainment. iii) Students will able to differentiate between various types of social media platforms and understanding their unique features and purposes. iv) Students will able to understand the impacts of social media on societyand able to evaluate the challenges and concerns associated with social media.	1. To introduce students to the fundamental concepts and theories of the sociology of cinema. 2. To examine the relationship between cinema and society. 3. To understand the impact of cinema on social norms, values, and identities. 4. To analyze the role of films in shaping cultural and social change. 5. To explore contemporary issues in cinema with a focus on Indian films.
Sociology SEC VSC	SEC-Personality Development, Learning Objectives of the course: i) To provide knowledge about Sociology as subject and relation to other social science ii) To provide knowledge regarding development of social thought and emergence of Sociology iii) To familiarize with Pioneer Sociologists and their brief contribution to Sociology iv) To introduce Indian Sociologists to have ideological perspective v) To explore basic concepts of Sociology Course Outcomes (COS) i) Students will understand the period of renaissance and its significance in the development of social thought. ii) Students will understand the major contributions and theories of pioneer	VSC-Family counselling, Learning Objectives of the course: i) To introduce the student to the important role of family and marriage institution in social system. ii) To orient the student to the family counseling and its process. iii) To aware the student to the various problems of marriage and family iv) To make students able to understand functions of family and marriage v) To introduce techniques for family counseling Course Outcomes (COs): i) Students will understand the Characteristics of Family.. ii) Students will analyze the Changing Nature of Family. iii) Students will able to Identify and Address Issues and Problems in

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	sociologists. iii) Students will able to define sociology through a scientific lens. iv) Students will get introduction of Indian sociologists and their contribution v) Students will acquaint with basic concepts of Sociology	Family. iv) Students will able to explore the Significance and Role of Family Counseling
History	B.A. I year History	History
History COs	DSC.1-Major 1 Mandatory (Core) M1-History of India (Up to 300 BC), CO 1: To Study various type of sources in history. CO 2: To put forth Socio-economic and religious history of India. CO 3: To understand various concepts in ancient India	DSC.4-Major 1 Mandatory (Core) M4-History of India (300BC to 650AD), CO 1: To Study the Varius Dynasties in History of India CO 2: To understand rise and expansion of various dynasties. CO 3: To put forth the significance of various dynasties.
	DSC.2-,	DSC.5-,
	DSC.3-,	DSC.6-,
History GE OE	GE/OE-History of Buddhism, CO 1: To Study the Sources of Buddhism. CO 2: To understand Life and philosophy of Gautam Buddha. CO 3: To Sensitize about the impact of Buddhism.	GE/OE-History of Jainism, CO 1: To Study the sources of Jainism. CO 2: To understand teachings of Jainism. CO 3: To put forth major sects in Jainism.
History SEC VSC	SEC1-Study in Museology, CO 1: To Study the basic concept of Museology. CO 2: To create awareness about Museology.	VSC-Study in Archieology , CO 1: To Study the basic concept of Archaeology. CO 2: To create awareness about Archaeology.

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	CO 3: To put forth importance of Museology.	CO 3: To put forth importance of Archaeology.
Psychology	B.A. I year Psychology	
Psychology PEO	Programme Educational Objective (PEOs) 1. To orient the students towards identification and analysis of various aspects of Psychology. 2. To develop students' aptitude for acquiring basic skills of carrying out field work. 3. To guide students to learn the science and art of collecting, processing and interpreting the data. 4. Demonstrate the ability to communicate information by utilising both lecture and practical exercises. 5. Inculcate the ability to evaluate and solve psychological problems effectively. Programme Outcomes (Pos) 1. Understanding Psychological Theories and Concepts: Provide a comprehensive understanding of major theories, concepts, and historical developments in psychology across various subfields. 2. Critical Thinking and Analysis: Foster critical thinking skills to evaluate psychological research, theories, and real-world applications, encouraging students to question assumptions and draw evidence-based conclusions. 3. Developing Research Skills: Equip students with the ability to design, conduct, and analyse psychological research using both quantitative and qualitative methods. 4. Effective Communication Skills: Develop effective written and oral communication skills to articulate psychological concepts, research findings, and arguments to diverse audiences. 5. Application of Psychological Principles: Enable students to apply psychological principles and theories to understand human behavior in various contexts, such as education, healthcare, business, and social services. Programme Specific Outcomes (PSOs) After completing this programme, the Learner will 1. Understand concept and theories of psychology 2. Applying psychology knowledge and research to real world 3. Ability to conduct psychological research 4. Develop effective communication skills	

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	5. Acquire skills to apply the psychology knowledge to different settings.	
Psychology Cos DSC1, 4	DSC.1-Major 1 Mandatory (Core) M1-Introduction to Psychology Experiment, i) Understand concept of psychology ii) Acquired methods of learning iii) Identify methods of memory improvement	DSC.4-Major 1 Mandatory (Core) M4-Individual Difference Psychometric Testing, After completion of the course students will be able to i) Understood concept of intelligence ii) Acquired basic knowledge of emotions iii) Insight about personality
	DSC.1 A Exeriments i) Develop skill of observation ii) Analysis data iii) Conducting experiments,	DSC.4.B- Psychometric testing After completion of the course students will be able to i) Develop skill of observation ii) Analysis data iii) Conducting experiments
Psychology GE OE	GE/OE-Personality Development, i) Understand personality ii) Will have Self- knowledge iii) Take action for personality development	GE/OE-Stress Management, After completion of the course students will be able to i) Learn Sources of stress ii) Understand techniques of relaxation iii) Know different methods of stress reliving exercise
Psychology SEC VSC	SEC1-Memory Enhancement, Course Outcome (CO): After completion of course students will be able to: i) Understand the techniques of memory improvement ii) Apply the memory improvement technique iii) Conduct the memory technique activity	VSC-Identifying traits, Course Outcome (CO): After completion of course students will be able to: i) Apply the knowledge of personality traits ii) Develop analytical skill iii) Do personality profiling

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Geography	B.A. I year Geography	Geography
Geography COS DSC1. 4	DSC.1-Major 1 Mandatory (Core) M1-Physical Geography & Practical Geography, Course Outcomes: 1. Students will know the basic concept in Physical Geography. 2. Understand earth's tectonic and structural evolution 3. Gain knowledge about earth's interior and various theories regarding earth. 4. Acquire knowledge about types of folds and faults and earthquakes, volcanoes and rocks classification.	DSC.4-Major 1 Mandatory (Core) M4-Human Geography and Practical Geography, Course Outcomes: After the completion of the course, the students will have the ability to: 1. Gain knowledge about major themes of human Geography. 2. Acquire knowledge about the history and evolution of human being. 3. Learn about the various races and racial groups and settlement pattern.
	DSC.1- Practical Learning Outcome: After the completion of course, the students will have ability to: 1. Students will know the definition of Cartography and scale of maps. 2. Students Understand the methods of reliefs, 3. Comprehend the concept of relief features and representation of slopes through contour line.	DSC.4- Practical Course Outcomes: After the completion of course, the students will have ability to: 1. Distinguish between various types of cartographic techniques. 2. Develop an idea about different types of Graphs 3. Acquire knowledge to prepare Diagrams from statistical data and also the ability to interpret them.
Geography GE OE	GE/OE-Regional Geography of Maharashtra, Learning Outcomes: After the completion of course, the students will have ability to: 1. Acquaint students with Geography of Maharashtra. 2. Aware of the magnitude of problems and prospects in Maharashtra.	GE/OE-Regional Geography of India, Course Outcomes: 1. Understanding the physical division and climate characteristics of India. 2. 2. Acquint with the soil and natural vegetation type and charactieristcs of India.

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	3. Understanding the inter-relationship between the subject and the society. 4. Understanding the recent trends in regional studies.	
Geography SEC VEC	SEC-ISO Tophographical Survey Sheet interpretation, Course Outcomes: 1. Achieve the knowledge of SOI Toposheets. 2. Examine the Contour patterns used in the Toposheets. 3. Understanding the relief features and cultural features in the Toposheets. 4. Comprehend the correlation between physical and cultural factors.	VEC-Socio Economic Survey OR Study Tour, Course Outcomes: 1. Understanding of Socio-Economic condition. 2. Recognize the social & economic situation of the village. 3. Enhance the ability of collecting data. 4. Acquire the skill of making questionnaire & report writing.

DSC.1-Major 1 Mandatory (Core) M1-Introduction to Psychology Experiment, DSC.1-, DSC.3-, GE/OE-Personality Development, SEC1-Memory Enhancement, VSC-, AEC1-English, IKS1-, VEC-, CC-Health and wellness,

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B.Sc. Programme Outcomes & Course Outcomes

B.Sc.	B.Sc. I year Semester I	B.Sc. I year Semester II
Chemistry	Chemistry	
POs	Programme Outcomes (POs): The National Education Policy (NEP) 2020 for India emphasizes several key aspects for Bachelor of Science (B.Sc.) programs, aiming to produce graduates who are not only well- versed in their respective disciplines but also equipped with skills necessary for holistic development and employability. While specific program outcomes may vary between institutions and disciplines within B.Sc. programs, here are some common outcomes aligned with NEP 2020: PO1. The citizenship and society: Apply broad understanding of ethical and professional skill in science subjects in the context of global, economic, environmental and societal realities while encompassing relevant contemporary issues. ➤ PO2. Environment and sustainability: Apply broad understanding of impact of science subjects in a global, economic, environmental and societal context and demonstrate the knowledge of, and need for sustainable development. ➤ PO3. Ethics: Apply ability to develop sustainable practical solutions for science subject related problems within positive professional and ethical boundaries. ➤ PO4. Individual and team work: Function effectively as a leader and as well as team member in diverse/ multidisciplinary environments. ➤ PO5. Communication: Communicate effectively on complex science subject related activities with the scientific community in particular and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. ➤ PO6. Project management and finance: Demonstrate knowledge and understanding of the first principles of science and apply these to one's own work as a member and leader in a team, to complete project in any environment. ➤ P07. Life-long learning: Recognize the need for lifelong learning and have the ability to engage in independent and life-long learning in the broadest context of technological change. These program outcomes align with the broader goals of NEP 2020 to transform higher education in India and prepare students for the challenges and opportunities of the 21st century. Board of Studies designing B.Sc. curricula are encouraged to incorporate these outcomes into their program objectives and	

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learning outcomes.

Programme Specific Outcomes (PSOs):

PSO1; Core competency: The chemistry graduates will know the fundamental concepts of chemistry and applied chemistry. These fundamental concepts would reflect the latest understanding of the field, and therefore, are dynamic in nature and require frequent and time- bound revisions.

PSO2; Communication skills: Chemistry graduates will possess minimum standards of communication skills expected of a Chemistry graduate in the country. They are expected to read and understand the documents with in-depth analyses and logical arguments. Graduates are expected to be well-versed in speaking and communicating their idea/finding/concepts to wider audience.

PSO3; Critical thinking: Chemistry graduates are expected to know basics of cognitive biases, mental models, logical fallacies, scientific methodology and constructing cogent scientific arguments.

PSO4; Psychological skills: Chemistry Graduates are expected to possess basic psychological skills required to face the world at large, as well as the skills to deal with individuals and students of various sociocultural, economic and educational levels. Psychological skills may include feedback loops, self-compassion, self-reflection, goal- setting, interpersonal relationships, and emotional management.

PSO5; Problem-solving: Chemistry Graduates will be equipped with problem-solving philosophical approaches that are pertinent across the disciplines.

PSO6; Analytical reasoning: Chemistry Graduates acquire formulate cogent arguments and spot logical flaws, inconsistencies, circular reasoning etc.

PSO7; Research-skills: Chemistry Graduates will be keenly observant about what is going on in the natural surroundings to awake their curiosity. Chemistry Graduates are expected to design a scientific experiment through statistical hypothesis testing and other a priori reasoning including logical deduction.

PSO8; Teamwork: Chemistry Graduates will be team players, with productive cooperations involving members from diverse socio-cultural backgrounds.

PSO9; Digital Literacy: Chemistry Graduates are expected to be digitally literate for them to enroll and increase their core competency via e-learning resources such as MOOC and other digital tools for lifelong learning. Chemistry Graduates should be able to spot data fabrication and fake news by applying rational skepticism and analytical reasoning.

PSO10; Moral and ethical awareness: Chemistry Graduates will be responsible citizen of India and be aware of moral and ethical baseline of the country and the world. They are expected to define their core ethical virtues good enough to distinguish what construes as illegal and crime in Indian constitution. Emphasis be given on academic and research ethics, including fair Benefit Sharing, Plagiarism, Scientific Misconduct and so on.

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	PSO11; Leadership readiness: Chemistry Graduates are expected to be familiar with decision making process and basic managerial skills to become a better leader. Skills may include defining objective vision and mission, how to become charismatic inspiring leader and so on.	
Chemistry-DSC.1, 2, 4, 5 COs	DSC.1-Major 1 Mandatory (Core) M1-Fundamentals of Chemistry.1 Course Outcomes (COs): After completion of the course, students will be able to - i) Write the electronic configurations of the elements ii) Understand the changes in periodic properties in modern periodic table iii) Understand the different types of electron displacement in a molecule iv) Differentiate between inductive, electromeric, resonance, and mesomeric effects. v) Understand the methods of formation, structure and properties of the intermediate. vi) Understand the basic concepts and different laws of thermodynamics and thermochemistry vii) The concept of chemical equilibrium	DSC.4-Major 1 Mandatory (Core) M4-Fundamentals of Chemistry.2 Course Outcomes (COs): After completion of the course, students will be able to - i) Identify the type bond ii) Predict the shape and geometry and bond angle in a molecule iii) Understand the factors affecting ionic bond formation iv) Identify types of isomerism v) Apply the CIP rules for nomenclature of stereoisomers vi) Rate of reactions and factors affecting it vii) Solve the numerical on order reactions
	DSC.2-Lab course Course Outcomes (COs): After completion of the course, students will be able to - i) To consistently follow established SOPs for various chemical experiments. ii) To prepare solution of desired concentration.. To maintain accurate and thorough records of experimental data, and analyze results to draw meaningful conclusions. iv) To apply critical thinking skills to identify and address challenges that may	DSC.5-Labcourse Course Outcomes (COs): After completion of the course, students will be able to) i) Acquire skills in common techniques for the Volumetric estimations of inorganic compound Acquire skills in common techniques preparation and purification of organic compounds. Assess the effectiveness of purification techniques v) Develop precision in measuring

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	arise during experiments, showcasing the ability to troubleshoot and optimize procedures. v) To gain insights into how chemical lab practices are applied in professional research or industrial settings, preparing them for future careers in diverse scientific and industrial fields. vi) Students will demonstrate ethical conduct in all aspects of laboratory work, emphasizing integrity, responsibility, and professionalism	and recording physical constants v) Analyze the relationship between melting/boiling points and purity. vi) Develop skills in recording and reporting experimental procedures and results vii) Handle different apparatus like eudiometer viscometer, stalagmometer for determining physical properties
Chemistry GE/OE	GE/OE-Herbal chemistry Course Outcomes (COs): After completion of the course, students will be able to - CO1: acquainted with importance of herbal drugs, CO2: know the different sources of herbal medicine and their preparation CO3: acquire the knowledge of organic farming CO4: know about the Indian system of drugs ayurveda, Unani, siddha and homeopathy COS: know health benefits and role of nutraceuticals	GE/OE- Herbal Chemistry –II Course Outcomes (COs): After completion of the course, students will be able to - CO1: acquainted with importance of herbal drugs, CO2: know the different sources of herbal medicine and their preparation CO3: acquire the knowledge of organic farming CO4: know about the Indian system of drugs ayurveda, Unani, siddha and homeopathy COS: know health benefits and role of nutraceuticals
Chemistry SEC1 VSC	SEC1-Water treatment and analysis1 – Theory Course Outcomes (COs): After completion of the course, students will be able to - i) Resources and properties of water ii) Understand the different pollutants Understand treatment of domestic and industrial water	VSC-Cosmetic and Perfumery and soap and detergent-Theory Course Outcomes (COs): After completion of the course, students will be able to - 1. Classify the perfumes 2. Understand the constituent of perfumes 3. Preparation of perfumes

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	iv) Understand the sources of water pollution	4. Constitutes of cosmetics 5. Method of preparing cosmetics 6. Prepare essence
Chemistry SEC1 VSC	SEC1-Water treatment and analysis1 - practical Course Outcomes (COs): After completion of the course, students will be able to - i) Resources and properties of water ii) Understand the different pollutants iii) Understand treatment of domestic and industrial water iv) Understand the sources of water pollution v) Carryout experiment for determination of water quality parameters	VSC-Cosmetic and Perfumery and soap and detergent-Practical Course Outcomes (COs): After completion of the course, students will be able to - 1. Classify the perfumes 2. Understand the constituent of perfumes 3. Preparation of perfumes 4. Constitutes of cosmetics 5. Method of preparing cosmetics 6. Prepare essence
Physics	Physics	
Physics POs	Programme Educational Objectives (PEOs): Programme Educational Objectives (PEOs) for the Bachelor of Science Curriculum under the National Education l'olicy 2020: 1. Mastery of Discipline-Specific Knowledge: Graduates of the Bachelor of Science program will demonstrate a deep understanding of fundamental principles, theories, and methodologies in their chosen scientific discipline, enabling them to analyze complex problems, propose innovative solutions, and contribute to advancements in their field. 2. Interdisciplinary Proficiency: Graduates will pozacao the ability to integrate knowledge and skills from multiple scientific disciplines, fostering a holistic approach to problem- solving and innovation. They will be equipped to address multifaceted challenges by drawing upon diverse perspectives and methodologies. 3. Critical Thinking and Analytical Skills: Graduates will develop strong critical thinking ahilities, enabling them to evaluate information rigorously, analyze data effectively, and make informed decisions based on evidence. They will demonstrate proficiency in applying logical reasoning and scientific methods to solve problems and generate new knowledge. 4 Leadership and Innovation: Graduates will demonstrate leadership qualities and entrepreneurial mindset, capable of initiating and driving positive change in their	

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organizations and communities. They will exhibit creativity, resilience, and adaptability, harnessing innovation to address complex challenges and seize opportunities for growth and advancement.

5. Global Citizenship and Cultural Sensitivity: Graduates will possess a global perspective and cultural sensitivity, recognizing the interconnectedness of diverse communities and the importance of collaboration across borders. They will engage in cross-cultural dialogue, embrace diversity, and contribute to the advancement of knowledge and understanding on a global scale.

These Programme Educational Objectives serve as guiding principles for the Bachelor of Science curriculum, reflecting our commitment to nurturing well-rounded graduates who are prepared to excel in their careers, contribute to society, and lead meaningful lives in a rapidly changing world.

Programme Outcomes (POs):

The National Education Policy (NEP) 2020 for India emphasizes several key aspects for Bachelor of Science (B.Sc.) programs, aiming to produce graduates who are not only well- versed in their respective disciplines but also equipped with skills necessary for holistic development and employability. While specific program outcomes may vary between institutions and disciplines within B.Sc. programs, here are some common outcomes aligned with NEP 2020:

➤ PO1. The citizenship and society: Apply broad understanding of ethical and professional skill in science subjects in the context of global, economic, environmental and societal realities while encompassing relevant contemporary issues.

➤ PO2. Environment and sustainability: Apply broad understanding of impact of science subjects in a global, economic, environmental and societal context and demonstrate the knowledge of, and need for sustainable development.

➤ PO3. Ethics: Apply ability to develop sustainable practical solutions for science subject related problems within positive professional and ethical boundaries.

➤ PO4. Individual and teamwork: Function effectively as a leader and as well as team member in diverse/ multidisciplinary environments.

➤ PO5. Communication: Communicate effectively on complex science subject related activities with the scientific community in particular and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

➤ PO6. Project management and finance: Demonstrate knowledge and understanding of the first principles of science and apply these to one's own work as a member and leader in a team, to complete project in any environment.

➤ PO7. Life-long learning: Recognize the need for lifelong learning and have the ability to engage in independent and life-long learning in the broadest context of

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technological change.

These program outcomes align with the broader goals of NEP 2020 to transform higher education in India and prepare students for the challenges and opportunities of the 21st century. Board of Studies designing B.Sc. curricula are encouraged to incorporate these outcomes into their program objectives and learning outcomes.

Programme Specific Outcomes (PSOs):

On completion of the 03/04 years Degree in B.Sc. (Physics) students will be able to:

PSO1: Domain knowledge: Graduates will have an in-depth comprehension of fundamental theories and principles across various domains of physics, encompassing classical mechanics, electromagnetism, thermodynamics, quantum mechanics, nuclear and high- energy physics, solid-state physics, materials science, electronics, and modern physics.

PSO2: Problem Analysis: Graduates will demonstrate adeptness in analysing complex physical problems, formulating hypotheses, and employing appropriate mathematical and computational techniques for solutions. They will understand the significance of equations, formulas, graphs, and mathematical tools. Furthermore, they will effectively utilize technology for experimental design and implementation, data analysis, numerical methods, and computational techniques in problem-solving.

PSO3: Design Development of solutions: Graduates will possess the capability to create and execute experimental setups, simulations, and theoretical models, effectively addressing scientific inquiries and resolving practical physics-related issues. They will have both fundamental and advanced-level expertise in physics, enabling them to proficiently utilize computational tools and scientific software.

PSO4: Conduct Investigation of complex problems: Graduates will exhibit proficiency in conducting investigations of intricate physics problems, which involves effectively utilizing established knowledge and methodologies to design experiments, meticulously analyzing resulting data to extract pertinent information, and accurately interpreting data to draw valid conclusions, thereby contributing to a deeper comprehension of the problem under scrutiny.

PSO5: Modern Tools: Graduates will demonstrate proficiency in employing modern experimental, computational, and data analysis tools and techniques prevalent in physics research and industrial settings. They will adeptly apply and cultivate skills in physics and engineering for industrial applications, production, and technology development and transfer. Furthermore, they will hone advanced analytical skills tailored for job requirements in industries, consultancies, educational institutions, research organizations, or public administration.

PSO6: Communication Skills: Graduates will effectively communicate scientific ideas, methodologies, and results through written reports, oral presentations, and scientific publications, facilitating collaboration and dissemination of knowledge within the scientific community.

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Programm out come's and Course out come's 2.6.1& 2.6.2

Physics Cos DSC1,2,4,5	DSC.1-Major 1 Mandatory (Core) M1-Mechanics and properties of Matter Course Outcomes (COs): After completion of the course, students will be able to - i Understand Newton's laws of motion. ii Recognize different forces existing in nature and their physical significance. iii Acquire deep knowledge of physical quantities such as elasticity, viscosity, and surface tension. iv Develop the capacity to investigate and analyze daily problems related to mechanical Movement	DSC.4-Major 1 Mandatory (Core) M4-Optics Course Outcomes (COs): On completion of the course, students will be able to, i Acquire the basic concept of optics and its applications. ii Explain how image formation takes place in lenses iii Understand the operations of many modern optical devices iv Understand the optical phenomenon such as interference and diffraction
	DSC.2-Practical Based DSC1- Mechanics and properties of Matter Course Outcomes (COs): After completion of the course, students will be able to - i Understand gravitational acceleration through pendulum analysis and learn material stiffness and viscosity determination techniques using various setups. ii Explore rotational dynamics through flywheel experiments for moment of inertia and torsional property analysis. iii Develop instrument precision skills via least count analysis, crucial for physics and related field pursuits.	DSC.5-Practical Based DSC3 Course Outcomes (COs): On completion of the course, students will be able to, i Understanding of interference and diffraction phenomena through hands-on experimentation. ii Appreciation of practical applications of optical instruments across various scientific disciplines. iii Proficiency in conducting precise measurements and observations using optical instruments. iv Analyze experimental results critically and compare them with theoretical expectations.
	DSC.3-Practical Based DSC1	DSC.6-Practical Based DSC3
Physics GE OE	GE/OE-Everyday Physics Course Outcomes (COs): After completion of the course, students will be able to-i The course imparts essential physics principles to real-world contexts, covering transportation fundamentals, sports analysis, and sustainable weather solutions.	GE/OE-Physics in Sports Course Outcomes (COs): On completion of the course, students will be able to, i Explain how Newton's laws relate to athletic performance.

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	ii Students will understand concepts such as linear and circular motion, friction, and energy/momentum, applying them to transportation and sports. iii Additionally, they'll explore sustainable weather management and green energy technologies, gaining practical knowledge about home electricity systems.	ii Evaluate sports equipment design and performance. iii Assess the effects of environmental conditions of athletic performance. iv Apply strategies for optimizing performance in various conditions.
Physics SEC1 VSC1	SEC1-Basic Instrumentatio skill Course Outcomes (COs): After completion of the course, students will be able to - i Gain understanding of measurement fundamentals including instrument accuracy, precision, and errors, as well as principles of voltage, current, and resistance measurement using voltmeters, ammeters, and multimeters. ii Master the use of CRO for voltage (DC and AC), frequency, and time period measurements, and understand signal and pulse generator specifications, alongside distortion factor meter usage and wave analysis. iii Learn analog versus digital instrument distinctions, comprehend digital multimeter block diagrams and operations, and understand time interval, frequency, and period measurements using universal counters, emphasizing time-base stability, accuracy, and resolution.	VSC1-Electrical Measurements ~~OR Electronic Communication~~ Course Outcomes (COs): On completion of the course, students will be able to, i Understand and apply fundamental electrical measurement concepts. ii Gain the skill in selecting appropriate measurement methods and minimizing errors. iii Understanding of electrical device characteristics and their role in measurement circuits. iv Calibrate instruments and verify their accuracy against standards.
Physics /sec 1 VSC1	SEC1-Basic Instrumentatio skill- Practical based Course Outcomes (COs): After completion of the course, students will be able to- i Employ digital multimeters for measuring DC voltages, currents, resistance, and AC voltages. ii Acquire advanced knowledge in circuit tracing and troubleshooting techniques for electronic equipment, including understanding the operation of signal and	VSC1-Electrical Measurements ~~OR Electronic Communication~~ Course Outcomes (COs): On completion of the course, students will be able to, Course Outcomes (COs): On completion of the course, students will be able to, i. Student develop the skill reading the electrical instruments.

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	pulse generators. iii Conduct frequency measurements using oscilloscopes and analyze and compare two frequencies using oscilloscope analysis.	ii. Minimization of errors and get exposure to know the idea of measurements. iii. To do handling and repair the electrical instruments.
Microbiology	Microbiology	
Microbiology POs	Programme Outcomes (POs): The National Education Policy (NEP) 2020 for India emphasizes several key aspects for Bachelor of Science (B.Sc.) programs, aiming to produce graduates who are not only well- versed in their respective disciplines but also equipped with skills necessary for holistic development and employability. While specific program outcomes may vary between institutions and disciplines within B.Sc. programs, here are some common outcomes aligned with NEP 2020; PO1. The citizenship and society: Apply broad understanding of ethical and professional skill in seienee subjects in the context of global, economic, environmental and societal realities while encompassing relevant contemporary issues. PO2. Environment and sustainability: Apply broad understanding of impact of science subjects in a global, economic, environmental and societal context and demonstrate the knowledge of, and need for sustainable development. PO3. Ethies: Apply ability to develop sustainable practical solutions for science subject related problems within positive professional and ethical boundaries. PO4. Individual and team work: Function effectively as a leader and as well as team member in diverse/ multidisciplinary environments. PO5. Communication: Communicate effectively on complex science subject related activities with the scientific community in particular and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. PO6. Project management and finance: Demonstrate knowledge and understanding of the first principles of science and apply these to one's own work as a member and leader in a team, to complete project in any environment. PO7. Life-long learning: Recognize the need for lifelong learning and have the ability to engage in independent and life-long learning in the broadest context of technological change. These program outcomes align with the broader goals of NEP 2020 to transform higher education in India and prepare students for the challenges and opportunities of the 21st century. Board of Studies designing B.Sc. curricula are encouraged to incorporate these outcomes into their program objectives and	

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	learning outcomes. Programme Specific Outcomes (PSOS): PSO1. Domain knowledge: Acquire knowledge and gain understanding of concepts in microbiology and its applications in various fields. PSO2. Problem Analysis: Applying the knowledge acquired to explore the world of microbes and analysing the specific benefits. PSO3. Design Development of solutions: Design/ develop solutions for problems at varied complexity in various areas of Microbiology to address changing challenges in various industries and environment thereby developing keen interest in research. PSO4. Conduct Investigation of complex problems: Use established knowledge and methods to design of experiments, analyze resulting data statistically and interpret the same to provide valid conclusions for applied research. PSO5. Modern tools: Create, select, and apply appropriate techniques, resources, and relevant IT tools including prediction and modelling to complex related activities with clear understanding of the limitations for solving real world problems.	
Microbiology DCS1,2,4,5	DSC.1-Major 1 Mandatory (Core) M1.MBN.111Fundamentals of Microbiology Course Outcomes (CO's)After successful completion of this course, students are expected to: CO1: Understanding the History of Microbiology: Gain knowledge on Historical perspectives of Microbiology. CO2: Microscopy Techniques: understand the concepts of Microscopy and get acquainted to various microscopic methods. CO3: Taxonomy and Classification: Understand the concept of taxonomy, familiarize with classification systems and characteristics of bacteria used for classification. CO4: General Characteristics of Microorganisms: Know general features of various kinds of microorganisms	DSC.4-Major 1 Mandatory (Core) M4-Microbial Techniques CO1: Define and explain the key concepts of sterilization and disinfection, including types of agents, spectrum of activity, mode of action, and applications. CO2: Apply pure culture techniques to isolate, enumerate, and cultivate microorganisms, using a variety of culture media and methods. CO3: Perform and interpret common staining procedures for the microscopic observation of Microorganisms.

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Programm out come's and Course out come's 2.6.1& 2.6.2

	DSC.2—MBN.121. Practical course MBN.111 CO1:Gain knowledge on Historical perspectives of Microbiology CO2: Understand the concepts of Microscopy and get acquainted to various microscopic methods CO3:Understand the concept of taxonomy, familiarize with classification systems and characteristics of bacteria used for classification. CO4:Know general features of various kinds of microorganisms	DSC.5-- Microbial Techniques Practical CO1: Stain the bacterial structures using special staining techniques. CO2: Able to prepare different cultivation media for microorganisms. CO3: Enumerate microflora from different ecological samples. CO4: Validate and evaluate instruments and disinfectant
	DSC.3-Practical	DSC.6-Practical
Microbiology GE OE	GE/OE-Microbial Biotechnology CO1: Microbial Diversity and Functionality: Students will gain an understanding of the diverse microorganisms used in biotechnology and their specific functions. This includes knowledge of bacteria, fungi, and viruses and their roles in bioprocessing and bio-product development. CO2: Bioprocess Engineering: Students will learn the principles of bioprocess engineering, including fermentation techniques and optimization of microbial growth conditions. CO3: Bioproduct Development: Students will be able to develop and evaluate microbial-based products.	GE/OE- Food Fermentations CO1: Understanding Fermentation Principles: Students will develop a comprehensive understanding of the science and principles of fermentation, including the role of microorganisms (bacteria, yeast, and molds) in the fermentation process and the biochemical changes that occur during fermentation. CO2: Fermentation Techniques and Practices : Students will learn various fermentation techniques used for different food sources, including vegetables, grains, meat, and milk. CO3: Product Development and Quality Control: They will understand how to monitor and control the quality and safety of these products throughout the fermentation process. CO4: Cultural and Nutritional Significance: Students will gain insights into the cultural and nutritional significance of

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		fermented foods.
Microbiology SEC1, VSC1	SEC1-Water Analysis and practical CO1: Students will gain knowledge related to water microbiology, properties and standard quality of water. They will also learn the various water borne diseases. 10 CO2: will get to know the various methods used in water sample collection/treatment and the different tests for determining the quality of water.	VSC1-Pathology1 and sustainable Agriculture practical CO1: Understanding Hematological Basics: Students will develop a fundamental understanding of the components of blood, including red blood cells, white blood cells, platelets, and plasma. They will learn about the structure and function of these blood components. CO2: Blood Testing and Analysis: Students will learn how to perform basic hematological tests, interpret results from tests like complete blood counts (CBC), and understand the significance of different blood parameters in diagnosing and monitoring hematological conditions. CO3: Clinical Applications: Students will be introduced to the clinical applications of basic hematology in healthcare settings. They will understand the role of hematology in disease diagnosis, patient care, and treatment
Microbiology SEC1, VSC1	SEC1-Water Analysis and practical. Practical based CO1: Students will gain knowledge related to water microbiology, properties and standard quality of water by performing various test in laboratory. CO2: Will get to know the various methods used in water sample collection/treatment and the different test for determining the quires of water.	VSC1-Pathology1 and sustainable Agriculture practical CO1: will collect the blood. CO2: They will get to know the different techniques for counting the RBC and WBC. CO3: measure Hb estimation from blood samples.

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Programm out come's and Course out come's 2.6.1& 2.6.2

Botany	Botany
Botany POs	Programme Outcomes (POs): The National Education Policy (NEP) 2020 for India emphasizes several key aspects for Bachelor of Science (B.Sc.) programs, aiming to produce graduates who are not only well- versed in their respective disciplines but also equipped with skills necessary for holistic development and employability. While specific program outcomes may vary between institutions and disciplines within B.Sc. programs, here are some common outcomes aligned with NEP 2020: PO1. The citizenship and society: Apply broad understanding of ethical and professional skill in science subjects in the context of global, economic, environmental and societal realities while encompassing relevant contemporary issues. PO2. Environment and sustainability: Apply broad understanding of impact of science subjects in a global, economic, environmental and societal context and demonstrate the knowledge of, and need for sustainable development. PO3. Ethics: Apply ability to develop sustainable practical solutions for science subject related problems within positive professional and ethical boundaries. PO4. Individual and team work: Function effectively as a leader and as well as team member in diverse/ multidisciplinary environments. PO5. Communication: Communicate effectively on complex science subject related activities with the scientific community in particular and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. PO6. Project management and finance, Demonstrate knowledge and understanding of the first principles of science and apply these to one's own work as a member and leader in a team, to complete project in any environment. PO7. Life-long learning: Recognize the need for lifelong learning and have the ability to engage in independent and life-long learning in the broadest context of technological change. These program outcomes align with the broader goals of NEP 2020 to transform higher education in India and prepare students for the challenges and opportunities of the 21st century. Board of Studies designing B.Sc. curricula are encouraged to incorporate these outcomes into their program objectives and learning outcomes. Programme Specific Outcomes (PSOs): Botany specific PSOs PSO1. Domain knowledge: Apply the knowledge of fundamental and advanced areas of Pant Science for the wellbeing of the human. PSO2. Understanding the various Plant Groups: The basic knowledge and

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	evolution of different plant groups like Bacteria, Algae. Fungi, Bryophytes, Pteridophytes, Gymnosperms an Angiosperms will be given to students. PSO3. Understanding structures of plant body: The detailed morphological, anatomical. palynological, embryological structures will give the understanding about the plant body. PSO: Understanding processes in plant body: The mechanism of anabolic and catabolic activities, cell divisions and growth in plant bodies will be explained to increase the production of Crop plants. PSO5: Understanding properties and uses of plants to maintain health: The properties and uses of common medicinal plants, spices, Vegetables etc. will be explained to maintain the good health. PSO6. Enriching knowledge related with Agriculture: Use of established knowledge regarding mannuaring, composting, use of Biofertilizers and ecofriendly Insecticides and pesticides for the sustainable development.	
Botany Cos DSC1,2,4,5	DSC.1-Major 1 Mandatory (Core) M1-Morphology of Angiosperm ➤ Describe morphological peculiarities of vegetative organs of angiosperms. ➤ Describe morphological peculiarities of reproductive organs in angiosperms. ➤ Know the diagnostic features of plant species	DSC.4-Major 1 Mandatory (Core) M4-Cryptogomic Botany1 ➤ Classify lichens, algae and fungi up to orders according to the system of classification proposed by G. M. Smith (1950), Alexopoulos & Mims (1979). ➤ Classify and describe the morphology, structure, life cycle of some Lichens, algae, fungi and gymnosperms. ➤ Exemplify lichens, algae and fungi of economic importance. ➤ Identify common plant diseases and devise the suitable control measures.
	DSC.2-Lab course-DSC.1 ➤ Describe morphological peculiarities of vegetative organs of angiosperms. ➤ Describe morphological peculiarities of reproductive organs in angiosperms. ➤ Know the diagnostic features of plant species	DSC.5-Lab course-Diversity of Cryptogom ➤ Classify lichens, algae and fungi up to orders according to the system of classification proposed by G. M. Smith (1950), Alexopoulos & Mims (1979). ➤ Classify and describe the morphology, structure, life cycle of

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Programm out come's and Course out come's 2.6.1& 2.6.2

		some Lichens, algae, fungi and gymnosperms. ➤ Exemplify lichens, algae and fungi of economic importance. ➤ Identify common plant diseases and devise the suitable control measures.
Botany GEOE	GE/OE-Seed Production & Preservation Technique 1. Insist on the quality Seed production 2. Increase the production of quality Seeds 3. Will know the best natural practices to store the seeds for longer period	GE/OE- Pomology i) Enrich the knowledge about horticultural principles and practices relevant to fruit cultivation and will take initiative to cultivate fruits ii) Will apply fundamental aspects of orchard operations and its management iii) Will become expert in plant propagation techniques.
Botany SEC1 VSC1	SEC1-Fungal Discuses of crop plants & their management Theory 1) Identify Fungal Diseases of Crop plants of the region 2) Treat the fungal diseases of the crop plants 3) Manage the crops in their agriculture field from fungal diseases	VSC-Biofertilizers techniques and Organis composting Theory Acquire the knowledge of biofertilizers techniques. Learn laboratory skill, lab organization & nutritional importance of different biofertilizers. Understand about the bio fertilizer techniques - isolation, identification, screening and cultivation, method and its economic.
Botany SEC1 VSC1	SEC1-Fungal Discuses of crop plants & their management .Practicals 1) Identify Fungal Diseases of Crop plants of the region 2) Treat the fungal diseases of the crop plants 3) Manage the crops in their agriculture	VSC-Biofertilizers techniques and Organis composting Practical Acquire the knowledge of biofertilizers techniques. Learn laboratory skill, lab organization & nutritional importance of different

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	field from fungal diseases	biofertilizers. Understand about the bio fertilizer techniques - isolation, identification, screening and cultivation, method and its economic.
Computer Science	Computer Science	
Computer Science POs	Programme Outcomes (POs): The National Education Policy (NEP) 2020 for India emphasizes several key aspects for Bachelor of Science (B.Sc.) programs, aiming to produce graduates who are not only well- versed in their respective disciplines but also equipped with skills necessary for holistic development and employability. While specific program outcomes may vary between institutions and disciplines within B.Sc. programs, here are some common outcomes aligned with NEP 2020: ➢ PO1. To develop problem solving abilities using a computer. ➢ PO2. To prepare necessary knowledge base for research and development in Computer Science. ➢ PO3. Ethics: Apply ability to develop sustainable practical solutions for science subject related problems within positive professional and ethical boundaries. ➢ PO4. Individual and team work: Function effectively as a leader and as well as team member in diverse/ multidisciplinary environments. ➢ PO5. Communication: Communicate effectively on complex science subject related activities with the scientific community in particular and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. ➢ PO6. Project management: Demonstrate knowledge and understanding of the first principles of science and apply these to one's own work as a member and leader in a team, to complete project in any environment. ➢ PO7. Life-long learning: Recognize the need for lifelong learning and have the ability to engage in independent and life-long learning in the broadest context of technological change ➢ PO8. To train students in professional skills related to Software Industry These program outcomes align with the broader goals of NEP 2020 to transform higher education in India and prepare students for the challenges and opportunities of the 21st century. Board of Studies designing B.Sc. curricula are	

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	encouraged to incorporate these outcomes into their program objectives and learning outcomes. Programme Specific Outcomes (PSOs): PSOI. Domain knowledge: Apply the knowledge of Computer Science fundamental, and advanced areas of Computer Science to provide comprehensive solution PSO2. Problem Analysis: Identify Computer Science related problems at varied complexity and analyze the same to formulate/ develop substantiated conclusion PSO3. Design Development of solutions: Design/ develop solutions for problems at varied complexity in various areas of Computer Science to address changing challenges put forward by market demand/ stakeholder PSO4. Conduct Investigation of complex problems: Use established knowledge and methods to design of experiments, analyze resulting data and interpret the same to provide valid conclusions. PSO5. Modern tools: Create, select, and apply appropriate techniques, resources, and modern electronics and relevant IT tools including prediction and modeling to complex Information Technology related activities with clear understanding of the limitations.	
Computer Science Cos DSC1,2,4,5	DSC.1-Major 1 Mandatory (Core) M1-Programming in C i) Implement basic C programs ii) Develop and implement conditional and iterative statements iii) Implement different types of arrays iv) Develop and implement modular applications in C using functions v) Implement structure and pointers	DSC.4-Major 1 Mandatory (Core) M4-Programming in C++ vi) Implement basic C programs vii) Develop and implement conditional and iterative statements viii) Implement different types of arrays ix) Develop and implement modular applications in C using functions x) Implement structure and pointers
	DSC.2- Programming in C Practical- on DSC.1 i) Implement basic C programs ii) Develop and implement conditional and iterative statements iii) Implement different types of arrays iv) Develop and implement modular applications in C using functions	DSC.5- Programming in C++ Practical vi) Implement basic C programs vii) Develop and implement conditional and iterative statements viii) Implement different types of arrays ix) Develop and implement modular applications in C using

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Programm out come's and Course out come's 2.6.1& 2.6.2

	v) Implement structure and pointers	functions x) Implement structure and pointers
	DSC.3-Practical	DSC.6-Practical
Computer Science GE/Oe	GE/OE-Cyber Security 1. Understands the concept and process of cyber security. 2. Understands the Online Dispute Resolution. 3. Knows the Network & Mobile Security Techniques.	GE/OE- Ecommerce and E-content 1. Understand issues in e-commerce. 2. Understand E-Commerce and E-Business-Models and Approaches.
Computer Science SEC1, VSC1	SEC1-HTML Theory i) Understand fundamentals of web technologies. ii) Construct visually appealing static web page. iii) Understand linking in web page. iv) Understand basics of forms. v) Use CSS for enhanced presentation and user experience.	VSC-Java Script and Basics of networking Theory i) Ability to understand fundamentals of JavaScript ii) Proficiency in developing interactive and dynamic web applications. iii) Understanding of basic functions in JavaScript iv) Understand Internet and web technology.
Computer Science SEC1, VSC1	SEC1-HTML practical i) Understand fundamentals of web technologies. ii) Construct visually appealing static web page. iii) Understand linking in web page. iv) Understand basics of forms. v) Use CSS for enhanced presentation and user experience.	VSC-Java Script and Basics of networking practical i) Ability to understand fundamentals of JavaScript ii) Proficiency in developing interactive and dynamic web applications. iii) Understanding of basic functions in JavaScript iv) Understand Internet and web technology.
Mathematics	Mathematics	
Mathematics POS	Programme Outcomes (POs):	

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Programm out come's and Course out come's 2.6.1& 2.6.2

The National Education Policy (NEP) 2020 for India emphasizes several key aspects for Bachelor of Science (B.Sc.) programs, aiming to produce graduates who are not only well- versed in their respective disciplines but also equipped with skills necessary for holistic development and employability. While specific program outcomes may vary between institutions and disciplines within B.Sc. programs, here are some with NEP 2020; outcomes aligned

➤PO1. The citizenship and society: Apply broad understanding of ethical and professional skill in science subjects in the context of global, economic, environmental and societal realities while encompassing relevant contemporary issues.

➤ PO2. Environment and sustainability: Apply broad understanding of impact of science subjects in a global, economic, environmental and societal context and demonstrate the knowledge of, and need for sustainable development.

➤ PO3. Ethics: Apply ability to develop sustainable practical solutions for science subject related problems within positive professional and ethical boundaries.

➤ PO4. Individual and team work: Function effectively as a leader and as well as team. member in diverse/ multidisciplinary environments.

➤ PO5. Communication: Communicate effectively on complex science subject related activities with the scientific community in particular and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

➤ PO6. Project management and finance: Demonstrate knowledge and understanding of the first principles of science and apply these to one's own work as a member and leader in a team, to complete project in any environment.

➤ PO7. Life-long learning: Recognize the need for lifelong learning and have the ability to engage in independent and life-long learning in the broadest context of technological change.

These program outcomes align with the broader goals of NEP 2020 to transform higher education in India and prepare students for the challenges and opportunities of the 21st century. Board of Studies designing B.Sc. curricula are encouraged to incorporate these outcomes into their program objectives and learning outcomes.

Programme Specific Outcomes (PSOS):

On completion of the 03/04 years Degree in B.Sc. (Mathematics) students will be able to:

PSO 1.Disciplinary Knowledge: Bachelor degree in Mathematics is the culmination of in-depth knowledge of Algebra, Calculus, Geometry, differential equations and several other branches of pure and applied mathematics. This also

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	leads to study the related areas.. PSO 2.Critical thinking and analytical reasoning: The students undergoing this programme acquire ability of critical thinking and logical reasoning and capability of recognizing and distinguishing and various aspects of real life problems. PSO 3.Problem Solving: The Mathematical knowledge gained by the students through this programme develops an ability to analyse the problems, identify and define appropriate computing requirements for its solutions. This programme enhances students overall developments. PSO 4. Research related skills: The completing this programme develops the capability of inquiring about appropriate questions relating to the Mathematical concepts in different areas of Mathematics. Ability to pursue advanced studies and research in pure and applied Mathematical sciences PSO 5.Information/digital Literacy: The completion of this programme will enable the learner to use appropriate software's to solve system of algebraic equations and differential equations. PSO 6. Self-directed learning: The students completing this programme will develop ability of working independently and to make an in-depth study of various notions of Mathematics.	
Mathematics Cos DSC1,2,4,5	DSC.1-Major 1 Mandatory (Core) M1-Calculus Course Outcomes (COs): After completion of the course, students will be able to - i) Find derivative of hyperbolic, inverse hyperbolic functions and nth derivatives of given functions. ii) Find the Maclaurin's series expansion of functions. iii) Find the partial derivatives of functions. iv) Determine areas of plane regions, length of curves and volume of solid of revolution.	DSC.4-Major 1 Mandatory (Core) M4-Differentail Equations Course Outcomes (COs): After completion of the course, students will be able to - i) Determine the solution of first order linear differential equations. ii) Determine the solution of exact differential equations. Determine the solution of linear equations with constant coefficient using general and short method. iv) Determine the solution of linear homogeneous differential equations.
	DSC.2-practical based Lab on DSC.1 Course Outcomes (COs): After completion of the course, students will be able to -	DSC.5-Labcourse-on Differentail Equations on DSC.4 Course Outcomes (COs): After completion of the course,

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	i) Find derivative of hyperbolic, inverse hyperbolic functions and nth derivative of given functions. ii) Find the Maclaurin's series expansion of functions. iii) Find the partial derivatives of functions. iv) Determine areas of plane regions. length of curves and volume of solid of revolution.	students will be able to - i) Determine the solution of first order linear differential equations. ii) Determine the solution of exact differential equations. iii) Determine the solution of linear equations with constant coefficient using general and short method. iv) Determine the solution of linear homogeneous differential equations.
Mathematics GEOE	GE/OE-Business Mathematics Course Outcomes (COs): After completion of the course, students will be able to - i) Apply knowledge of ratios and proportions. ii) Apply currency and discounts to business. iii) Identify the functions and linear functions. iv) Apply the identified functions to cost and profit.	GE/OE- Matrics Course Outcomes (COs): After completion of the course, students will be able to i) Apply the operations of matrices. ii) Apply the properties of matrices. iii) Find the determinant of square matrix and minors. iv) Solve system of equations.
Mathematics Sec1, VSC1	SEC1-Theroy of Equations Theory Course Outcomes (COs): After completion of the course, students will be able to - i) Solve the cubic and bi-quadratic equations. ii) Find the imaginary and surd roots. iii) Solve the discussion of reciprocal equations. iv) Apply the Horner's process.	VSC1-Financial Accounting and Basic Statistics Course Outcomes (COs): After completion of the course, students will be able to - i) Apply the basic accounting and financial terminology. ii) Perform the financial transactions. iii) Use the financial statements to assess a company's performance.
Mathematics Sec1, VSC1	SEC1-Theroy of Equations lab course	VSC1-Lab course based on VSC1A.Financial Accounting and

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Programm out come's and Course out come's 2.6.1& 2.6.2

	Course Outcomes (COs) Course Outcomes (COs): After completion of the course, students will be able to - i) Solve the cubic and bi-quadratic equations. ii) Find the imaginary and surd roots. iii) Solve the discussion of reciprocal equations. iv) Apply the Horner's process.	Basic Statistics Course Outcomes (COs): After completion of the course, students will be able to - i) Apply the basic accounting and financial terminology. ii) Perform the financial transactions. iii) Use the financial statements to assess a company's performance

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B.Com. Programme Outcomes & Course Outcomes

B.Com. I year 2024-25 Programme Outcomes (POs)	

Programme Outcomes (POs);

The National Education Policy (NEP) 2020 for India emphasizes several key aspects for Bachelor of Commerce (R.Com.) programs, aiming to produce graduates who are not only well- versed in their respective disciplines but also equipped with skills necessary for holistic development and employability. While specific program outcomes may vary between institutions and disciplines within B.Com. programs, here are some common outcomes aligned with NEP 2020.

PO1. Contribution to the Economy and Society: Make significant contributions to the economy and society through their roles as business leaders, entrepreneurs, professionals, and responsible citizens, fostering economic growth, innovation, and social welfare.

PO2. Ethics, Environment and Sustainability: Ability to develop sustainable practical solutions for complex business-related problems within positive professional and ethical boundaries. Develop understanding for social and sustainable business issues and demonstrate the knowledge of and need for sustainable development.

PO3. Entrepreneurial Mindset and Innovation: Cultivate an entrepreneurial mindset, fostering creativity, innovation, and a willingness to take calculated risks to identify and pursue. opportunities for value creation and business innovation.

PO4. Individual and team work: Work effectively in diverse teams, demonstraring Icadership, interpersonal skills, and the ability to collaborate with others to achieve common goals and solve complex problems.

POS. Communication: Communicate effectively on complex business related activities and issues with business counterparts in particular and with the society at large, such as, being able to comprehend and write effective reports and design documentation. To make effective presentations, and give and reecive clear instructions.

PO6. Digital Literacy and Technological Proficiency: Demonstrate proficiency in using digital tools, technologies, and information systems relevant to the field of commerce, enabling them to analyze data, automate processes, and adapt to technological advancements.

P07. Continuous Learning and Adaptability: Embrace lifelong leaming, proactively seeking opportunities for professional development, acquiring new skills, and adapting to changing business trends, technologies, and regulatory environments.

These program outcomes align with the broader goals of NEP 2020 transform higher education in India and prepare students for the challenges and opportunities of the 21" century. Board of Studies designing B.Com curricula are encouraged to incorporate the outcomes into their program

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objectives and learning outcomes.

Programme Specific Outcomes (PSOs):

(Programme specific outcomes are discipline/major specific. Different major will have different PSOS. Following is the example of PSOs for Accounting & Finance Major. Respective BoS is expected to draft PSOs related to their Major)

PSO1 Financial Reporting and Analysis: Graduates will demonstrate proficiency in preparing, analyzing, and interpreting fimumiul stutements in accordame with accounting standards and regulations, enabling them to provide accurate and reliable financial information for decision-making.

PSO2 Managerial Accounting and Cost Management: Graduates will apply managerial accounting techniques to analyze costs, budgets, and performance metrics. enabling them to support strategic decision-making and optimize resource allocation within organizations.

PSO3 Taxation and Compliance: Graduates will possess a comprehensive understanding of tax laws and regulations, enabling them to prepare tax returns, advise on tax planning strategies, and ensure compliance with tax obligations for individuals and Euxinesses

PSO4 Auditing and Assurance Services: Graduates will understand the principles and practices of auditing internal contrade and mco cervices, enabling them in conduct audits, assess risks, and provide assurance on the reliability and integrity of financial information.

PSOS Financial Management and Investment Analysis: Graduates will analyze Anancial markers, evaluate investment opportunities, and make informed dectsions. regarding capital structure, capital budgeting, financing, dividends and risk management to maximize shareholder value and wealth creation.

PSO6 Financtal Markets and Institutions: Graduates will demonstrate knowledge of financial markets, instruments, and institutions, including banking, securines, and derivatives markets, enabling them to analyze market trends, evaluate investment options, and manage financial assets.

PSO7 Ethics and Professional Standards: Graduates will adhere to ethical principles and professional standards in their practice of accounting and finance, demonstrating integrity, objectivity, and professional skepticism in their decision-making and conduct.

These Program Specific Outcomes provide a focused framework for students pursuing a major in Accounting and Finance within the B.Com program, equipping them with the specialized knowledge, skills, and competencies required to excel in professional roles within the accounting, finance, and related fields.

Course Outcomes (COs):	
B.Com. I year	
1st Semester	2nd Semester

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DSC-1 Financial Accounting – 1 Course Outcomes (COs): After completion of the course, students will be able to- 1. To prepare and analyse the financial statements. 2. Acquire the basic concep: of accounting terms. 3. Record the different financial activities & Practices	DSC 4 Financial Accounting – II Course Outcomes (COs): After completion of the course, students will be able to- 1. Understand the process of recording and classifying the business transactions and events 2. Understand the financial statements, viz., Profit and Loss Account, Balance Sheet, and cash flow statement of a sole proprietor. 3. Abridge the ability to prepare and analyse the branch account. 4. Acquire concept of departmental accounting.
DSC-2 Principles of Management – I Course Outcomes (COs): After completion of the course, students will be able to- i) Demonstrate understanding of the role of managers in modern business organizations ii) Absorb various management concepts, principles and theories iii) Examine the managerial functions having an impact on the business effectiveness	DSC- 5 Principles of Management II Course Outcomes (COs): After completion of the course, students will be able to- i) Demonstrate understanding of the role of effective direction in modern business organizations ii) Design motivation strategies for business effectiveness iii) Learners will diagnose various styles and qualities of efficient leadership, Coordination and Controlling iv) Identify the contemporary issues and challenges in business management
DSC-3 Entrepreneurship Development –I CO 1: To Create Awareness Amongst students about Entrepreneurship. CO 2: To Understand Theories while applying in the Business. CO 3: To know about Foundation of Entrepreneurship and its theories. CO 4: To identify the type of entrepreneur and the steps involved in an entrepreneurial Ventur	DSC- 6 Entrepreneurship Development – II CO 1: To provide knowledge and information about Entrepreneurship Development. CO 2: To provide knowledge and create ability for setting up an enterprise within given Environment
GE/OE -11. Basics of Accounting Course Outcomes (COs): 1) Students understand concept of Basic Accounting and apply the knowledge in own business. 2) Students get the job opportunities in the company due to the knowledge of Basics of Accounting. 3) Students demonstrate ability to work at all sectors and stand in the professional life.	GL/OE2 1. Basics of Marketing Course Outcomes (CO3); 1) Studente understand fundamental concept of marketing and develop the plan for own business 2) Students gets the job opportunities due to the knowledge of marketing management. 3) Students demonstrate ability to work well with others communication skill
2. Basics of Finance CO 1: To understand the Fundamental	2. Fundamentals of Stock Market 1. to Develop the student's ability to deal with

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Programm out come's and Course out come's 2.6.1& 2.6.2

Concepts and Principles of Finance. CO 2: To Develop Basic Financial Management Skills for Personal and Business Purpose	practical approach towards stock market operations. 2. To enable the use of study chart plans and candlestick patterns. 3. To have a proper understanding of future and options trading.
3. Basic of Entrepreneurship Course Outcomes (COS): After completion of the course, students will be able to- i) To select a business idea ii) To prepare a project report iii) To register a unit (Udyog Aadhar Number)	3. Functions of Business Management
SEC-1 1. Office Automation Tools – I CO 1: To give Basic Hands on Knowledge of Word Processing using MS Word CO 2: To provide Basic Hands on Knowledge of Spreadsheet Processing using MS Excel CO 3: To deliver the fundamental Knowledge of presentations using MS PowerPoint. CO 4: To make students familiar with e-mail account.	VSC 1 1. Application Spreadsheet Software CO 1: To prepare students to Construct a professionally designed and formatted spreadsheet. CO 2: To Create various types of charts and enhance charts with drawing tools CO 3: To Use named ranges, create a database and perform sort, filter and extract. CO 4: To use advanced formulas and functions from each category of functions provided by Excel.
2. Personal Finance & Planning Course Outcomes (COs): After completion of the course, students will be able to- 1. Understand the need and relevance of planning of personal finances 2. Orient students with basic concepts of saving, investment, 3. Effectively use modern office automation tools,	2. Business Presentation
3. Basic Banking Operations	3. Business Documents CO 1: To make students familiar with business correspondence documents. CO 2: To train students with advanced MS Word Functions. CO 3: To make ready students to make professional documents.
AEC-1 English	AEC- 2 Hindi/Marathi/Pali/Urdu/Sanskrit
IKS-1 To be offered by University	VEC 1 Constitution of India To be Provided by the University
CC-1 Health & Wellness (To be offered by University)	CC2 Yoga education / Sports & Fitness To be provided by the university

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Programm out come's and Course out come's 2.6.1& 2.6.2

BCA Programme Outcomes & Course Outcomes

B.C.A. First year	

Programme Outcomes (POS)

These outcomes are designed to equip graduates with the technical expertise, analytical acumen, ethical sensibilities, and lifelong learning capabilities necessary to thrive in the dynamic landscape of computer application.

1. PO 1-Disciplinary knowledge:

Graduates will adeptly apply mathematical principles, algorithmic paradigms, and core computing fundamentals in the modeling, design, and development of computer-based systems, leveraging advanced technologies to address contemporary challenges.

2 . PO 2 Scientific reasoning/ Problem analysis:

Graduates will demonstrate advanced analytical skills to systematically analyze, categorize, and formulate solutions for multifaceted problems encountered within the domain of computer applications, utilizing cutting-edge technologies to enhance problem-solving capabilities.

3. PO 3-Problem solving:

Graduates will engineer software solutions to address complex scientific, business, and societal challenges, integrating considerations for modern technologies while prioritizing public health,

4. safety, and environmental sustainability. PO 4-Environment and sustainability:

Graduates will comprehend the environmental and societal impact of software solutions, striving to develop sustainable applications that promote societal well-being within the context of modern technological advancements.

5. PO5-Modern tool usage:

Graduates will proficiently utilize contemporary software development tools and methodologies to facilitate efficient and collaborative development practices, incorporating emerging technologies seamlessly into their workflows.

6. PO 6- Ethics:

Graduates will navigate ethical complexities inherent in computer application development, upholding professional integrity and social responsibility within the dynamic landscape of technology integration.

7 . PO 7-Cooperation/Teamwork:

Graduates will collaborate effectively as integral members or leaders of interdisciplinary teams, leveraging diverse skill sets and perspectives to achieve collective objectives in software development projects.

8. PO 8-Communication Skills:

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Graduates will demonstrate proficiency in communicating technical concepts and insights to diverse audiences, adeptly preparing and presenting technical documentation tailored to the needs of stakeholders in computer application projects.

9. PO 9-Self-directed and Life-long Learning:

Graduates will exhibit a proactive commitment to continuous self-improvement and professional development, recognizing the imperative of lifelong learning to remain abreast of evolving technologies and industry trends. . PO 10-Enhance the research culture and uphold scientific integrity and objectivity:

10 Graduates will actively contribute to fostering a vibrant research culture, upholding the principles of scientific integrity, objectivity, and reproducibility in their scholarly pursuits within the diverse realms of computer applications.

Programme Specific Outcomes (PSOs):

1. PSO1. Software Application Development Excellence: Apply programming paradigms and software engineering principles, practices, and tools to analyze, design, implement, test, and maintain software systems that meet quality standards and user requirements.

2. PSO2. Web Application Development Mastery: Design and develop dynamic and interactive web applications using modern web technologies and frameworks, ensuring compatibility, performance and security across different platforms and devices.

3. PSO3. Data-driven Decision Making: Utilize data analysis techniques, statistical models, and visualization tools to analyze, interpret, and present data effectively for decision-making and problem- solving in diverse domains.

1. PSO4. Cybersecurity Implementation: Implement security measures, conduct risk assessments, and respond to security incidents to protect information assets and mitigate cyber threats effectively, ensuring data confidentiality, integrity, and availability.

5. PSO5. Cloud Computing Integration: Design, deploy, and manage scalable and cost-effective cloud-based solutions using cloud computing technologies and platforms, ensuring reliability, availability, and performance to meet business needs and enable digital innovation.

6. PSO6. User Experience Innovation: Design and evaluate user interfaces and interactive systems using human-centered design approaches to create engaging, necessible, and usable experiences that meet user needs and preferences.

Course Outcomes	
Semester I	Semester II
DSC-1 Fundamentals of Computer Application Course Outcomes (COs): After completion of the course, students will be able to - i) Demonstrate a thorough understanding of computer hardware and software components,	DSC-7 Data Structures-I Course Outcomes (COs): After completion of the course, students will be able to - i) Understand and implement fundamental

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their functions, and interactions within a computing system. ii) Effectively utilize a range of productivity software applications to create, edit, and manage documents, data, and presentations. iii) Apply fundamental programming concepts using beginner-friendly languages to develop simple programs for solving basic computational problems. iv) Analyze and assess the ethical, social, and economic implications of computer applications, including cybersecurity, data privacy, and emerging technologies.	data structures like arrays, stacks, queues. ii) Program data structures and use them effectively in solving computational problems. iii) Evaluate basic algorithmic complexity to select suitable data structures and algorithms for problem-solving. iv) Apply searching and sorting algorithms in practical scenarios with proper justifications.
DSC-2 Practical based on DSC-1	DSC-8 Practical based on DSC-7
DSC-3 C-Programing-1 Course Outcomes (COs): After completion of the course, students will be able to - i) Develop, compile, execute, and debug C programs proficiently, thereby demonstrating their mastery of the programming language. ii) Apply problem-solving techniques effectively to various programming tasks, including algorithm design, flowchart interpretation, and implementation in C. iii) Understand program structure, control flow mechanisms, and data types in C, enabling them to design and implement efficient and structured programs. iv) Demonstrate strong algorithmic thinking skills, allowing them to formulate and implement algorithms for solving a wide range of computational problems using the C programming language.	DSC-9 C-Programming-II Course Outcomes (COs): After completion of the course, students will be able to - i) Demonstrate proficiency in designing and implementing C programs utilizing arrays and functions, effectively initializing, accessing elements, and managing memory allocation. ii) Apply advanced concepts of structures, unions, and pointers in programming tasks, including nested structures, dynamic memory allocation, and pointer arithmetic, to organize and manipulate data efficiently. iii) Utilize storage classes, preprocessors, and string handling functions proficiently, demonstrating a clear understanding of variable scope, preprocessor directives, and effective string manipulation techniques. iv) Develop practical problem-solving skills, applying learned concepts to real-world programming scenarios, and effectively employing arrays, functions, structures, unions, pointers, and string handling functions to create robust and efficient C programs.
DSC-4 Practical based on DSC-3	DSC-10 Practical based on DSC-9

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DSC-5 Operating System-I Course Outcomes (COs): After completion of the course, students will be able to - i) Compare different types of operating systems, considering their architectural features, strengths, and limitations. ii) Optimize resource utilization and system performance through effective application of process management techniques and CPU scheduling algorithms. iii) Design and implement robust synchronization mechanisms to ensure program correctness and efficiency in concurrent computing environments. iv) Make informed design decisions regarding operating system configurations and architectures, considering factors such as reliability, efficiency, and scalability.	DSC-11 Operating System-II Course Outcomes (COs): After completion of the course, students will be able to - i) Demonstrate proficiency in identifying, analyzing, and resolving deadlock situations in operating systems. ii) Apply various memory allocation strategies effectively to optimize resource utilization and enhance system performance. iii) Evaluate and implement appropriate disk management techniques to efficiently manage file systems and disk I/O operations. iv) Design and implement device management solutions, including I/O system components and device interfaces, to facilitate seamless data transfer and device interaction within operating systems.
DSC-6 Practical based on DSC-5	DSC-12 Practical based on DSC-11
GE/OE-1.Cyber Security Course Outcomes (COs): After completion of the course, students will be able to - 1. Understands the concept and process of cyber security. 2. Understands the Online Dispute Resolution. 3. Knows the Network & Mobile Security Techniques	GE/OE-2 E-Commerce Course Outcomes (COs): i) Student will get knowledge of different aspects of E-Commerce ii) Able to identify different components of E-Commerce iii) Will get knowledge of different security technologies used in E-Commerce. iv) Understand the risk in the e-commerce business.
SEC-1	VSC-1
SEC-1A Animation Designing or Course Outcomes (COs): After completion of the course, students will be able to - i) Navigate and utilize Scratch's interface effectively.	VSC-IA. PC- Maintenance-1 Course Outcomes (COs): After completion of the course, students will be able to i) Perform Basic Trouble shooting.

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ii) Develop and present simple animated projects using Scratch. iii) Apply basic animation principles to create engaging animations. iv) Utilize advanced features in Scratch to enhance animation quality and interactivity.	ii) Installation of Operating System, and device drivers. iii) Basic maintenance like Anti virus installation and updating and system scanning iv) Upgrading a PC v) Able to assemble a Desktop PC
SEC-1B Graphics Designing Course Outcomes (COs): After completion of the course, students will be able to - i) Design visually appealing graphics and layouts using Canva's tools and templates. ii) Apply fundamental design principles such as layout, color theory, and typography to create professional-looking designs. iii) Collaborate effectively with others on design projects using Canva's collaboration features. iv) Share and export their designs for various purposes and platforms, demonstrating proficiency in using Canva for real-world applications.	*or* VSC-IB Office Tools-I Course Outcomes (COs): After completion of the course, students will be able to - i) Gain a comprehensive understanding of office automation principles and its practical applications in modern workplaces. ii) Develop proficiency in using word processing tools for creating and managing various types of documents effectively. iii) Acquire advanced skills in spreadsheet software for data analysis, visualization, and database management tasks. iv) Demonstrate the ability to automate routine office tasks and processes to enhance productivity and efficiency in professional settings.
SEC-2 Practical based on SEC-1	VSC-2 Practical based on VSC-1
AEC-1 English (Common for all the faculty)	AEC-1 English (Common for all the faculty)
IKS-1 Choose any one from pool of courses	VEC-1 Constitution of India (Common for all the faculty)
CC-1 Health and Wellness (Common for all the faculty)	CC-2 Yoga Education/ Sports and Fitness (Common for all faculty)

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Programm out come's and Course out come's 2.6.1& 2.6.2

B.Sc. Biotechnology – Programme Outcomes & Course out come.

B.Sc. BT. 1st Semester	B.Sc. BT. 2nd Semester

The National Education Policy (NEP) 2020 for India emphasizes several key aspects for Bachelor of Science (B.Sc.) programs, aiming to produce graduates who are not only well versed in their respective disciplines but also equipped with skills necessary for holistic development and employability. While specific program outcomes may vary between institutions and disciplines within B.Sc. programs, here are some common outcomes aligned with NEP 2020:

Programme Outcomes

PO1. The citizenship and society: Apply broad understanding of ethical and professional skill in science subjects in the context of global, economic, environmental and societal realities while encompassing relevant contemporary issues.

PO2. Environment and sustainability: Apply broad understanding of impact of science subjects in a global, economic, environmental and societal context and demonstrate the knowledge of, and need for sustainable development.

PO3. Ethics: Apply ability to develop sustainable practical solutions for science subject related problems within positive professional and ethical boundaries.

PO4. Individual and team work: Function effectively as a leader and as well as team member in diverse/ multidisciplinary environments.

POS5. Communication: Communicate effectively on complex science subject related activities with the scientific community in particular and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive elear instructions.

PO6. Project management and finance: Demonstrate knowledge and understanding of the first principles of science and apply these to one's own work as a member and leader in a team, to complete project in any environment.

PO7. Life-long learning: Recognize the need for lifelong learning and have the ability to engage in independent and life-long learning in the broadest context of technological change.

These program outcomes align with the broader goals of NEP 2020 to transform higher education in India and prepare students for the challenges and opportunities of the 21st century. Board of Studies designing B.Sc. curricula are encouraged to incorporate these outcomes into their program objectives and learning outcomes.

Programme Specific Outcomes (PSOs):

On completion of the 03/04 years Degree in B.Sc. (Biotechnology) students will be able to:

PSO 1.Disciplinary Knowledge: Bachelor degree in Biotechnology is the culmination of in-depth knowledge of Biotechnology, Molecular Biology, R-DNA technology, Genetics, Biochemical mechanism, Plant animal tissue culture, and several other branches of Biotechnology. This also leads to study the related arcas. By acquiring this sound knowledge in the subject, Graduate in Biotechnology can be eligible for pursuing higher education and research/postgraduate education.

PSO 2. Specialized skill: Students will gain knowledge and develop specialized skill in the

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different area of Biotechnology. Graduate candidates will develop a sense of societal and ethical responsibility pertaining to bioinformatics, health, agriculture, dairy, genetic engineering, and fermentation industry.

PSO 4. Knowledge about research/thirst area in Biotechnology: The graduated student in Biotechnology will develop understanding about various research domains in Hiotechnology field.

PSO 5.Information/digital Literacy: The completion of this programme will enable the learner to use not only the fundamental tools Biotechnology but also its domainslike Bioinformatics and Biostatics.

PSO 6. This knowledge shall promote our graduates to stand independently amidst the growing technological innovations in the subject.

PSO7 The students completing this programme will develop ability of working independently and to make an in-depth study of various domains of Biotechnology.

Course Outcomes	
DSC-1 Biomolecules-I Course Outcomes (COs): After completion of the course, students will i. Gain knowledge about the chemical and molecular foundations of life and the role of energy rich compound in biological systems. ii. understand the role of sugars in energy production and living systems iii. Be able to Apply the link between the structure and functions of proteins in biological context iv. Analyze the role of lipds and apply the techniques to identify their purity	DSC-3 Biomolecules-11 Course Outcomes (COS): After completion of the course, students will be able to - i) Concept of DNA and RNA ii) Different types and importance of vitamins human iii) Functions of different hormones
DSC-2 Practical based on MI-DSC-1 Course outcome • After successful completion of this course, students are expected to: • perform qualitative tests for carbohydrates, lipids and amino acids • extract carbohydrate and proteins • estimation carbohydrates, lipids and proteins	DSC-4 Practical based on DSC-3 After successful completion of this course, students are expected to: • perform qualitative tests for nucleic acids, Vitamins and hormones. • perform quantitative tests for nucleic acids, Vitamins and hormones, • Perform purity test of biomolecules
DSC-1 Instrumentation-1 Course Outcomes (COs): After completion of the course, students will able	DSC-3 Instrumentation-11 Course Outcomes (COs): After completion of the course, students will

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Programm out come's and Course out come's 2.6.1& 2.6.2

to: - Understand and explain the principles and SOP of laboratory instruments. - • Explain the principle and working of Autoclave, pH meter, Hot air oven, Colorimeter etc. Demonstrate different instruments and techniques.	be able to - • Understand and explain the principles and SOP of laboratory instruments. • Explain the principle and working of Microscope, Spectrophotometer etc.
DSC-2 Practical based on M2-DSC-1 After successful completion of this course, students are expected to: • principles and SOP of laboratory instruments • Perform qualitative tests various biomolecule. Understand the application of instruments in Biotechnology.	DSC-4 Practical based on DSC-3 After successful completion of this course, students are expected to:. Observe various types of microorganism under microscope. Understand different parts of microscopes. Separate biomolecules by chromatography or electrophoresis
DSC-1 Microbiology I Course Outcomes (COs): After completion of the course, students will V. Gain knowledge about the chemical and molecular foundations of life and the role of energy rich compound in biological systems. vi. understand the role of sugars in energy production and living systems vii. Be able to Apply the link between the structure and functions of proteins in biological context viii. Analyze the role of lipds and apply the techniques to identify their purity	DSC-3 Microbiology II Course Outcomes (COs): After completion of the course, students will able to understand •Types of microbes base on nutritional requirement. • Different types of selective media. Concept and measurment of microbial growth. • Methods of sterilization of micro-organisms.
DSC-2 Practical based on M3-DSC-1 After successful completion of this course, students are expected to: • Hands on on Basic Microbiological techniques. • Importance of Microbial staining • Understand the Structural difference between algae, fungi and bacteria.	DSC-4 Practical based on DSC-3 After successful completion of this course, students are expected to: • Observe various types of microorganism under microscope. • Understand different parts of microscopes. • Separate biomolecules by chromatography or electrophoresis

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GE/OE-1 Introduction to biotechnology Course Outcomes (COs): After completion of the course, students will be able to - Understand fundamental principles involved in Biotechnology To bestow the students with all the research skills required to work independently To inculcate nature care by imparting knowledge of advance modern techniques.	GE/OE-2 Agriculture Biotechnology Course outcomes Student get knowledge about all types of biofertilizers Student would be aware of plant tissue culture techniques Student would know the basics of plant pathology and its genetic modification.
SEC-1 i) Microbial cultivation and Identification Course Outcomes (COs): After completion of the course, students will be able to - 1) Understand and explain importance of Microbial world. 2) Students will use identification techniques for microbial study. 3) Awareness of Practical advances in culture identification.	VSC-1 i) Biofertilizers Production Course Outc After completion of the course, students will be able to - Understand advantages of bio fertilizers over chemical fertilizers. Explain isolation and role of various soil bacteria in bio fertilizer production. Describe production steps and specific requirements for each bio fertilizer.
ii) Diagnostic Biology Outcomes of course On the completion of the course, the student should be able to: • Understand the difference between Quality Control and Quality Assurance in the molecular laboratory • Understand the importance of good pipetting techniques • Understand and perform simple and serial dilutions • Describe methods for quantification of nucleic acids • Report results for molecular testing	Ii) Plant Tissue culture Course Outcomes (COs): After completion of the course, students will be able to - understand the fundamental principles of plant tissue culture Will gain skills for PTC technique. Will gain knowledge of various plant organ culture systems

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• Follow a protocol to perform testing • Understand the use and purpose for isolating DNA. RNA and proteins 8. Explain the principle of electrophoresis as it applies to nucleic acids and proteins	
SEC-2 i) Practicals based on Microbial cultivation and Identification Course Outcomes (COs): After completion of the course, students will be able to - i) Student will gain knowledge about microbial isolation cultivation techniques. ii) Student will gain knowledge about microbial identification techniques. iii) Student will gain knowledge aboutsafety measures while handling microrganism	VSC-2 i) Practicals based on Biofertilizers Production Course Outcomes (COs): After completion of the course, students will be able to - i) Understand the mechanism of e biofertilizer preperation. ii) Isolate cyanobacteria iii) Isolate Nitrogen fixing and phsphate solubilizing microbes.
ii) Practicals based on Diagnostic Biology Course Outcomes (COs): After completion of the course, students will be able to - Students will learn to perform technical molecular biology assays on proteins, DNA, RNA that can be used in the diagnosis of human diseases.	ii) Practicals based on Plant Tissue culture Course Outcomes (COs): After completion of the course, students will be able to - understand the fundamental principles of plant tissue culture gain skills for PTC technique. gain knowledge of various plant organ culture systems.
AEC-1 English (Common for all the faculty)	AEC-1 English (Common for all the faculty)
IKS-1 Choose any one from pool of courses	VEC-1 Constitution of India (Common for all the faculty)
CC-1 Health and Wellness (Common for all the faculty)	CC-2 Yoga Education/ Sports and Fitness (Common for all the faculty)

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M.Sc. Biotechnology Programm outcome and Course outcomes

Course outcomes	
M.Sc. I BT I Semester	M.Sc. I BT-I I Semester
BIOT/MJ/500-T =Microbiology and Virology Students will gain a deep understanding of microbial diversity, structure, and function, enabling them to identify and characterize different microorganisms in various environments. • Graduates will be proficient in explaining microbial growth kinetics, nutrient utilization, and their applications in biotechnological processes, such as fermentation and bioremediation. • Students will be capable of analyzing viral life cycles, including attachment, entry, replication, and release, and their implications in viral diseases and antiviral strategies.	BIOT/MJ/550-T =Immunology Students will gain a deep understanding of the cellular and molecular components of the immune system and their coordinated responses to pathogens and foreign antigens. • Graduates will be proficient in explaining the principles of immune recognition, antigen processing, and the generation of immune memory. • Students will be capable of analyzing immunological mechanisms underlying allergic reactions, autoimmune diseases, and immunodeficiencies. • Graduates will be equipped to study the principles of vaccine development, including types of vaccines, adjuvants, and vaccination strategies for disease prevention. • Students will acquire knowledge of immunotherapeutic approaches, including monoclonal antibodies, checkpoint inhibitors, and adoptive T-cell therapies. • Graduates will be prepared to evaluate the potential of immunomodulatory agents in treating chronic diseases and cancer.
BIOT/MJ/500-P =Lab Course Based On BIOT/MJ/500- T Students will gain a deep understanding of the fundamental biomolecules, including proteins, nucleic acids, carbohydrates, and lipids, and their relevance in biotechnological research and applications. • Graduates will be proficient in explaining the structure-function relationships of biomolecules and their significance in biochemical reactions and cellular processes.	BIOT/MJ/550-P =Lab Course Based On BIOT/MJ/550- T

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• Students will be able to identify and analyze metabolic pathways and energy conversion mechanisms involved in biotechnological processes.	
BIOT/MJ/501-T =Biomolecules and Bioenergetics Students will gain practical proficiency in conducting enzyme activity assays and analyzing bioenergetic processes. • Graduates will be skilled in using advanced analytical instruments for biomolecule analysis and characterization. • Students will be prepared to contribute to research in biotechnology, bioenergy, and metabolic engineering.	BIOT/MJ/551-T =Enzyme Technology
BIOT/MJ/501-P =Lab Course Based On BIOT/MJ/501- T	BIOT/MJ/551-P =Lab Course Based On BIOT/MJ/551- T
BIOT/MJ/502-T =Inheritance Biology Students will gain a deep understanding of the principles of Mendelian genetics, including Punnett squares, pedigree analysis, and genetic inheritance patterns. • Graduates will be proficient in explaining the molecular basis of DNA replication, transcription, and translation, and the regulation of gene expression. • Students will be capable of analyzing genetic disorders, chromosomal aberrations, and the inheritance of complex traits.	BIOT/MJ/552-T =Molecular Biology Course Outcome: Ability to vividly relate the major molecular processes and its regulation Ability to understand the different levels of DNA repair systems and its importance. Ability to connect recombination with evolving lineages.
BIOT/MJ/502-T =Lab Course Based On BIOT/MJ/502- T	BIOT/MJ/552-P =Lab Course Based On BIOT/MJ/552- T
BIOT/MJ/503-P =Skills In Biotechnology I By successfully completing this course, students will acquire a comprehensive understanding of Good Manufacturing Practice (GMP) principles and their practical application in the biotechnology industry. Students will be equipped with the necessary skills to ensure the production of safe, effective, and high-quality biotechnological products while adhering to regulatory standards and ethical considerations.	BIOT/MJ/553-T =Skills In Biotechnology II

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BIOT/DSE/504 -AT =Techniques In Biotechnology Develop proficiency in performing advanced laboratory techniques relevant to medical biotechnology applications. 2. Apply critical thinking skills to design and execute experiments for medical diagnostics, therapeutics, and molecular medicine. 3. Gain an understanding of the ethical, regulatory, and safety considerations in medical biotechnology research. 4. Acquire knowledge of emerging trends and technologies in medical biotechnology and their potential impact on healthcare.	BIOT/DSE/554-AT =Cell & Developmental Biology Students will gain practical proficiency in culturing and differentiating stem cells for various applications. • Graduates will be skilled in analyzing and interpreting developmental biology data. • Students will be prepared to contribute to research in regenerative medicine and tissue engineering.
BIOT/MJ/504- AP =Lab Course Based On BIOT/MJ/504- A Hands-on Laboratory Skills: Develop proficiency in performing advanced laboratory techniques relevant to molecular diagnostics, personalized medicine, and medical biotechnology, including DNA extraction, PCR amplification, real-time PCR, ELISA, pharmacogenomics analysis, NGS data analysis, and more. 2. Experimental Design and Execution: Apply acquired skills to design and execute experiments for medical diagnostics, therapeutic interventions, and personalized treatment approaches, demonstrating the ability to plan, implement, and troubleshoot experimental procedures. 3. Data Analysis and Interpretation: Analyze experimental data, interpret results, and apply critical thinking to draw meaningful conclusions. Gain experience in using bioinformatics tools for analyzing sequencing data, interpreting molecular diagnostic outcomes, and presenting findings. Overall, this practical course equips students with practical skills and knowledge that are integral to conducting cutting-edge research and applications in medical biotechnology, contributing to advancements in personalized medicine and healthcare.	BIOT/DSE/554-AP =Lab course based on BIOT/DSE/554-AT
BIOT/DSE/504-BT =Plant Biotechnology	BIOT/DSE/554-BT =Genomics and data Sciences

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BIOT/DSE/504-BP Lab Course Based On BIOT/MJ/504- BT	BIOT/DSE/554-BP Lab course based on BIOT/DSE/554-BT Course Outcomes: 1. Data Processing and Analysis: Demonstrate the ability to preprocess and analyze raw genomic data, including sequencing reads, transcriptomics data, and variant datasets, using appropriate bioinformatics pipelines. 2. Functional Interpretation: Interpret and annotate genomic variants, identify functional elements (promoters, enhancers, etc.), and predict potential effects of mutations on gene function. 4. Bioinformatics Tools: Utilize a variety of bioinformatics tools and software packages to perform tasks such as sequence alignment, variant calling, gene expression quantification, and pathway analysis. 5. Problem Solving: Apply computational and statistical techniques to solve complex biological problems, such as identifying disease-associated genes, predicting gene function, and investigating evolutionary relationships. 6. Data Visualization: Create informative and visually compelling data visualizations to communicate results effectively and provide insights into genomic analyses. 7. Critical Thinking: Evaluate the quality of genomic data, critically assess the performance of bioinformatics algorithms, and make informed decisions about data analysis strategies. 8.By achieving these course objectives and outcomes, students will develop a strong foundation in genomic data science, enabling them to contribute to cutting-edge research, advancements in personalized medicine, and the understanding of complex biological processes.
BIOT/DSE/504-CT =Bioinformatics and BIG Data analysis	BIOT/DSE/554-CT =Animal Biotechnology

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M.Sc. II- BT III Semester=	M.Sc. I BT-II-IV Semester=
Biotechnology, Bioinformatics and other advance domains like AI & System Biology, Synthetic Biology and Intellectual property rights along with bioethical issues. In spite of these the programme outcomes is expected as, λ PO1: Impart dissertation work that develop critical thinking, problem solving, inculcating research aptitude and knowledge, teamwork, planning, interpretation and analysis in the domain of Biotechnology. λ PO2 Learn technical skills through laboratory sessions, research projects and develop self-directed experiential learning. λ PO3 Develop a technical skill set for employability, entrepreneurship and a basic research aptitude. λ PO4 Inculcating the wisdom and subtleties of work ethics of an industry and research organization in biotechnology and allied domains. PROGRAMME SPECIFIC OUTCOMES (PSOs) PSO1 Consolidation the fundamentals and principles of basic and applied aspects of Biotechnology with an aim to serve the society. • PSO2 Develop a technical skill set for generating, analyzing and interpreting scientific data for employability, entrepreneurship and research aptitude. • PSO3 Introducing scientific cognition, critical thinking, analysis using in age computational tools to develop competence for academic research and industry at par with the global scenario. • PSO4 Making students aware to the needs of a society for constructive contribution towards its sustainable growth and development of products of high socio-economic importance such as improved crops, vaccines, diagnostic tools, improve microbial strains for enhancing the production of high value compounds. • PSO5 Understand the social aspects, ethical concerns, issues of intellectual properties and policies of the Biotechnology industry along with evaluating the ethical, legal and social issues pertaining to use of biological systems.	
	M.Sc. BT. II year IVSEmester
BIOT/MJ/600-T Bioprocess Engineering Course Outcomes (COs) : After completion of the course, students will be able to - 1. Explain the principles and scope of bioprocess engineering and its significance in industrial applications. 2. Design and understand different types of bioreactors (batch, fed-batch, continuous) and understand the principles behind their scale-up. 3. Apply mass and energy balance principles to analyze and solve problems in bioprocess engineering. 4. Understand and model microbial growth	BIOT/MJ/650-T Industrial Technology Course Outcomes (CO): • Ability to comprehend the established industrial biotechnological products in health, agriculture, and environmental spectrum. • Ability to demonstrate the fundamental understanding about microbes as a potential source of lucrative products. • Ability to connect a sense of perspective towards efficient environmentally sustainable viable options. • Ability to understand and strategize production methods based upon the knowledge gained through practical and laboratory exposure.

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kinetics, substrate utilization, and product formation kinetics in bioprocesses. 5. Explain and apply various downstream processing techniques for the recovery and purification of bioproducts.	
BIOT/MJ/600-P Lab Course Based On BIOT/MJ/600- T	BIOT/MJ/650-P Lab Course Based On BIOT/MJ/650- T Course Outcomes (CO): • Capable to design a protocol based upon different possible biological sources • Ability to demonstrate the experimental skill needed for optimization studies. • Ability to analyse and interpret the results and modify necessary parameter to improve product yield.
BIOT/MJ/601- T Gene Expression & Genetic Engineering Course Outcomes (COs): After completion of the course, students will be able to - 1. Students will acquire the knowledge of the role of enzymes and vectors responsible for gene manipulation, transformation and genetic engineering 2. Gain insights of mechanism of gene expression and regulations. 3. Students will be able to gain hands on experience in gene cloning, protein expression and purification	BIOT/MJ/651-T rDNA technology Course Outcomes (COs): After completion of the course, students will be able to - 1. Understand the principle and the concept of cloning strategies, applications of PCR and know how to make and screen nucleic acid libraries. 2. Utilize various tools and technologies for designing and constructing recombinant products. 3. Explores the applications of RDT and highlighting emerging areas in the this field.
BIOT/MJ/601-P Lab Course Based On BIOT/MJ/601- T Course Outcomes (COs) : After completion of the course, students will be able to - 4. ghg 5. -- fghf 6. -- nfgnfc	BIOT/MJ/651-P Lab Course Based On BIOT/MJ/651- T Course Outcomes(COs) After completion of the course students will able to 1. Design the in-silico PCR primer and perform e-PCR. 2. Develop the gene amplification protocol 3. Develop the gene editing skills 4. Design an experiment for the expression of genes. 5. Gain hands on training on Blotting techniques
BIOT/MJ/602-T Bioinstrumentation Course Outcomes (COs) : After completion of the course, students will be able to - 1. Understand the variety of biophysical and biochemical techniques. 2. Understand Biomolecule Purification and	BIOT/MJ/652-T Bioinformatics Course Outcomes (COs) : After completion of the course, students will be able to understand - 1. Protein sequencing Databases 2. Genomics and Sequence Analysis 3. About proteoics

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microscopic imaging techniques. 3. Understand the variety of spectroscopic techniques of molecule characterization. 4. Study various approaches of analytical techniques	
BIOT/MJ/602-P Lab Course Based On BIOT/MJ/602- T	BIOT/MJ/652-P Lab Course Based On BIOT/MJ/652- T
BIOT/MJ/600-T Skills In Biotechnology III (Regulatory Affairs in Biotechnology) Course Outcomes (COs): After completion of the course, students will be able to - 8. To develop skills in preparing regulatory submissions and ensuring compliance with regulatory requirements. 9. Students will acquire the skills to prepare and submit regulatory documents for the approval of biotechnological products. 10. Students will be able to identify and address compliance and ethical issues in biotechnology research and development.	BIOT/DE/653-A Environmental Biotechnology Lab Course Based On Environmental Biotechnology Course Outcomes (COs): After completion of the course, students will be able to - 1. Explain the microbial methods for degradation of xenobiotics 2. Explain about waste water and waste handling processes from biotechnological perspective 3. Explain about various types of biotransformations
BIOT/DSE/554-A Plant Biotechnology-II Lab Course Based on Plant Biotechnology-II	BIOT/DSE/554-B Animal Biotechnology-II Lab Course Based Animal Biotechnology-II Course outcomes: Students will be able to 1. Explain the fundamental scientific principles that underlie cell culture 2. Acquire knowledge for isolation, maintenance and growth of cells. 3. Develop proficiency in establishing and maintaining of cell lines. 4. Acquire knowledge in animal cloning and its applications
BIOT/DSE/554-B A I and System Biology Lab Course Based on Plant AI and system Biology Course Outcomes (COs) : After completion of the course, students will be able to – 1. Understand and Explain Core Concepts of AI and System Biology 2. Analyse and Interpret Biological Data	BIOT/DSE/554-C Synthetic Biology Lab Course Based Synthetic Biology Course Outcomes (COs): After completion of the course, students will be able to - 1. Understand and apply key concepts and methodologies in synthetic biology. 2. Utilize various tools and technologies for designing and constructing synthetic

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3. Conduct Network Analysis & Integrate Multi-Omics Data 4. Use Advanced Bioinformatics Tools & Stay Updated with Emerging Trends	biological systems. 3. Analyze the applications and implications of synthetic biology in various fields and address ethical considerations. Course Outcomes (COs): By the end of the course, students will be able to: - 1. Apply synthetic biology techniques to construct and test genetic circuits. 2. Use modern tools and software for DNA assembly and genome editing. 3. Analyze the results of synthetic biology experiments and troubleshoot common issues.
BIOT/DSE/554-C Advanced Techniques in Biotechnology Lab Course Based on Advanced Course Outcomes (COs) : After completion of the course, students will be able to - 1. --undamental concepts of Vaccine Technology 2. --Understang the mode of action of nanomedicine 3. Understang the techniques of inheridet discsases diagosis	BIOT/DSE/554-D Pharmaceutical Biotechnology Lab Course Based Pharmaceutical Biotechnology Course Outcomes (COs) : After completion of the course, students will be able to - 1. Identify the prospects of applying Biotechnological concepts in pharmaceutical applications. 1. 2. Genetic engineering applications in relation to production of pharmaceuticals 3. Understand the importance of pharmaceutical products, such as vaccines, monoclonal antibodies,and gene therapies.
BIOT/DSE/554-D Entrepreneurship in Biotechnology Lab Course Based on Entrepreneurship in Biotechnology Course Outcomes (COs): After completion of the course, students will be able to - 1. Students will gain a deep understanding of the biotechnology industry, including its global and Indian landscapes, enabling them to identify opportunities and challenges within the sector. 2. Students will be able to develop detailed business plans, conduct thorough market research, and navigate regulatory and IP management complexities, preparing them to launch and manage biotech ventures. 3. Students will acquire skills in financial planning and management, learn	BIOT/DSE/554-E (MOOC Course) Or any Online certification course from NPTEL /SWAYM /MOOC of equivalent credits { with biology basis }

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to secure funding from various sources, and effectively pitch to investors, ensuring the financial viability of their biotech ventures.	
BIOT/DSE/554-E (MOOC Course) Or any Online certification course from NPTEL /SWAYM /MOOC of equivalentcredits { with biology basis }	BIOT/ RP /649 - Research Project Stage II

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M.Sc. Chemistry Program Outcomes & Course outcomes

M.Sc. Chemistry Program Outcomes	
M.Sc. Chemistry First Year –I semester	M.Sc. Chemistry First Year –II semester
Program Outcomes: The program outcomes (PO's) are the statement of competencies/ abilities. POs are the statement that describes the knowledge and the abilities the post-graduate will have by the end of program studies. i).In-depth and detailed functional knowledge of the fundamental theoretical concepts and experimental methods of chemistry. ii). Apply/implement interface between on the one hand, the history of chemistry and natural science and, on the other hand, issues pertaining to the areas of modern technology, health, and environment. Mohd Arif Ali Khan ni esibuse to iii). Skills in planning and conducting advanced chemical experiments and applying structural-chemical characterization techniques. iv). Skill in examining specific phenomena theoretically and/or experimentally. v). Generation of new scientific insights or to the innovation of new applications of chemical research. Course Program outcome Course Program Outcomes are developed through the curriculum (curricular/co- curricular-extra-curricular activities). The program outcomes are attained through the course implementation. As an educator, one must know, "To which POs his/her course is contributing?". So that one can design the learning experiences, select teaching method and design the tool for assessment.	
Course outcomes	
CHET/ MJ/500-DSC-1 Anal. Chem Course outcomes: on completion of this course student will be able to: 1. Understand why analytical measurements need to be made. 2. Understand the importance of producing reliable results. 3. define what is meant by 'quality'. 4. understand the importance of sampling and able to identify different types of samples. 5. understand the basics in each separation techniques, viz, crystalization, sublimation, distillation, extraction. 6. understand the theory of liquid-liquid extraction.	CHET/ MJ/550-DSC-8 Course outcomes: after completion of the this course students will be able 1. To understand basic principle of different chromatographic Techniques for separation of constituents of mixtures 2. To understand theory, instrumentation, working procedure and application as well as limitations of TLC 3. To understand theory, instrumentation, working procedure and application as well as limitations of liquid- liquid partition chromatography 4.To understand theory, instrumentation, working procedure and application as well as limitations of column chromatography 5. To understand theory, instrumentation,

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7. understand the theory of solid-phase extraction. 8. understand basic of chromatographic Techniques for separation of constituents of mixtures 9. understand rate and plate theory of chromatography.	working procedure and application as well as limitations of gel pearmeation chromatography 6.To understand theory, instrumentation, working procedure and application as well as limitations of ion exchange chromatography 7. To understand theory, instrumentation, working procedure and application as well as limitations of high performance liquid chromatography 8. To understand theory, instrumentation, working procedure and application as well as limitations of gas chromatography 9. To be able to select a particular chromatographic technique for separation of the constituents from a mixture. 10 To be aware of the various problems associated with different chromatographic techniques.
CHET/ MJ/501-DSC-2 Inorg. Chem Course outcomes: On completion of this course, the students will be able: 1. To understand the stability constant of metal complex, stepwise and overall formation constant. 2. To describe the factors affecting for stability of metal complexes 3. To identify and describe techniques for determination of formation constant of metal complexes. 4. To analyse the structural and stereoisomerism of metal complexes and their classifications. 5. To understand the mechanism in metal complexes. 6. To understand acid and base hydrolysis of metal complex and their mechanism. 7. To understand the role of trans effect in the synthesis of platinum complex. 8. To distinguish between the inner and outer sphere mechanism of electron transter reaction of metal complexes. 9. To memorise the function of essential and	CHET/ MJ/551-DSC-9 Course outcomes: On completion of this course, the students will be able: To define and classify metal carbonyls To design procedure to synthesize mononuclear and binuclear metal carbonyl To understand the properties and structure metal carbonyl. To apply the concept of effective atomic number for prediction of stability of metal carbonyls. To synthesize the nitrosyl halides and their properties. To understand the structure and properties and application of sodium nitroprusside. To apply the knowledge of EAN and 18 electron rules metal nitrosyl compound of transition elements. To understand the d orbital splitting in different environment. To understand factor affecting crystal field

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trace elements in biological systems. 10. To describe the structure and function of metalloporphyrins, Hemoglobin, cytochrome and hemocyanine. 11 . To understand the electron transfer, respiration and photosynthesis of biological system. 12. To know the diseases caused by deficiencies of Fe, Zn, Cu and Mn ions in biological system and remedies to them.	splitting energy To describe Jahn Teller distortion and CFSE for high and low spin complexes
CHET/ MJ/502-DSC-3 Org. Chem Course outcomes Student will be able to 1.Understand the chemical and molecular processes in organic chemical reactions. 2.Study the concept of Alternant and non-alternant hydrocarbons 3.Study the energy levels of π-molecular orbitals 4.Explain the concept of aromaticity 5.Know the types of mechanism in organic reactions 6. Study the different intermediates involved in organic chemical reactions 7. Understand the correlation between the thermodynamic and kinetic parameters 8. Learn the various types of aliphatic nucleophilic substitution reactions	CHET/ MJ/552-DSC-10 Course Objectives Student will be able to Understand various reactions involved in addition to C-C and C-O double bond Acquire the stereochemical aspects in addition reaction Understand mechanism of various named reactions Demonstrate/apply the concepts involved in elimination reaction
CHET/ MJ/503-DSC-4 Phy. Chem Course outcomes: student will be able 1. To understand the fundamental principles of chemical kinetics. 2. To learn different theories of chemical kinetics. 3. To understand concept of fast and slow reactions based on their rate constant and reaction rates. 4. To understand the concept of thermodynamics. 5. To apply critical thinking and problem solving skills to solve problem related to thermodynamics and chemical kinetics. 6. To understand the basic concept of micelles.	CHET/ MJ/553-DSC-11 Course Outcomes: student will be able 1. To understand the fundamental principles of quantum mechanics. 2. To solve the Schrodinger equations calculate wave function and energy levels. 3. To understand the postulates of quantum mechanics. 4.To understand the Huckel Molecular Theory of conjugated system and its applications.

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CHEL/ MJ/504-DSC-5 Inorg. Chem. Lab course Course outcomes: On completion of this course, the students will be able: 1. To understand the difference between qualitative and quantitative analysis. 2. To understand the concept of qualitative and quantitative chemical analysis and their chemical reactions and constituents. 3. To understand the design and development of experimental setup and procedure, for volumetric and gravimetric analysis of chemical compound. 4. To identify constituents of chemicals qualitatively and quantitively 5. To understand importance of accuracy and precision in measurement of chemical analysis 6. To apply grasped knowledge to solve chemical analysis related issues of stakeholder. 7. To understand importance of laboratory skills, precaution, accuracy and precision. 8. To separate and identify acidic & basic radicals from chemical sample. 9. To apply the grasped knowledge in chemical analysis of unknown sample.	CHEL/ MJ/554-DSC-12 Learning outcomes: On completion of this course, the students will be able: 1. To design experimental procedure for synthesis of metal complexes, calculation of conversion factors and characterization of synthesized coordination complexes compounds. 2. To understand, which skills are required in chemical laboratory. 3. To understand importance of accuracy and precision in chemical analysis 4. To design the experimental procedure for separation and estimation of metals from mixture solution. 5. To estimate the amount of constituents of chemicals by volumetric and gravimetrie methods. 6. To apply grasped knowledge for finding purity of chemicals.
CHEL/ MJ/-505-DSC-6 Org. Chem. Lab course Learning Outcome: On completion of this course, the students will be able 1.Understand the separation and purification techniques 2. Understand various step involved in identification of organic compounds 3. Understand the handling of equipment required for the analysis of organic compounds. 4. Understand the stichometry of the reaction 5 . To check the purity of compound using TLC 6. To check the Melting point	CHEL/MJ/- 555-DSC-13 Course Outcomes 1. To Perform/demonstrate the techniques involved in organic binary mixture separation specially solid- liquid mixture. 2. To perform distillation techniques for purification of organic compounds. 3. To use/ apply the technique of separation, crystallization derivatization and function Group detection. 4. To use the methods for the preparation of useful compounds using named reaction
CHEL/ MJ/-506-DSC-7 Phy. Chem. Lab course	CHEL/MJ/- 556-DSC-14

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Course Outcomes: On completion of this course, the students will be able: To analyse sample by various instrumental techniques To handling of electronic equipment To understand laboratory skills, precaution, accuracy and precision. To design experimental procedure for analysis important chemicals &samples To understand the physical properties of chemicals To distinguish accuracy of results in instrumental and non instrumental methods	Course Outcome: On completion of this course, the students will be able: To analyse sample by various instrumental techniques To handling of electronic equipment To understand laboratory skills, precaution, accuracy and precision. To design experimental procedure for analysis important chemicals &samples To understand the physical properties of chemicals To distinguish accuracy of results in instrumental and non instrumental methods
CHETE/SE 1507-DSE-I Anal. Chem Course outcomes: after completion of course students will be able 1. to define the differents regions of an electromagnetic radiation. 2. To understand the interaction/transition of the matter with different region of electromagnetic radiation. 3. to define basic elements of spectroscopic technique. 4. to calculate the wavelength at which a molecule show maximum absorption of UV- visible radiation. 5. To interpret the ultraviolet-visible spectrum 6. to define the bands in the IR spectrum due to fundamental frequency, and overtones, combination bands and Fermi resonance 7. to define the vibrational frquency of a particular bond 8. to calculate the vibrational frquency of a particular bond 9. To interpret the infrared spectrum 10. to predict the structure using UV-visible and IR spectrum.	CHETE/SE/5 57-DSE-6 Course outcomes: 1. To be able to define the factors that determine chemical shift 2. To be able to locate chemical shift positions of H attached to common functional groups. 3. To be able to define the chracteristic chemical shifts for different protons. 4. To be able to predict the structure of a compound using NMR data/spectrum. structure of a compound using UV-visible, IR, and NMR 5. To be able to predict the data/spectrum. 6. To understand the principle, instrumentation and applications of mass spectrometry. 7. To be able to define different ionization techniques in mass spectrometry. 8. To understand the fragmentation processes in mass spectrometry. 9. To be able to define the molecular formula from molecular ion peaks. 10 To understand the principle, instrumentation and applications of atomic absorption spectroscopy, flame emission

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	spectroscopy, electron spectroscopy for chemical analysis, Auger electron spectroscopy and ultraviolet photoelctron spectroscopy.
CHETE/SE 1508-DSE -2 Inorg. Chem Learning outcomes: On completion of this course, the students will be able: 1. To understand how to perform symmetry operation to chemical molecules. 2. To identify the symmetry elements based on structure of molecules. 3. To apply the knowledge of concept of symmetry element and operations and centre, axis and planes symmetries possessed by an object/orbitals/molecule. 4. To identify & classify of point group of molecules 5. To apply knowledge of group theory to understand properties of molecules, character of matrix, product of symmetry operations, reducible and irreducible representations. 6. To use knowledge of character of representations to designate appropriate Mulliken symbols. 7. To calculate the appearance of irreducible representation by correlating relation between IRs, RRs and order of group. 8. To evaluation of predict the product of symmetric and asymmetric representations and evaluate new irreducible representation. 9. To identify modes of molecular vibrations of chemical compounds.	CHETE/SE/5 58-DSE-7 Learning outcomes: On completion of this course, the students will be able: 1. To describe the generation of spectroscopic term symbols, ground state term & total term symbols, significance of spin multiplicities. 2. To use of microstates for representation electron representations 3. To sketch term energy level diagram. 4. To understand the designation of spin multiplicities to ligand field excited states of high and low spin complex. 5. To interpret A,E, T symmetric label for electronic configurations. 6.To construct correlation diagram of various electronic configurations 7. To analyse and interpretation Orgel diagram and Tanabe Sugano diagram.. 8. To interpret electronic spectra of transition metal complexes. 9. To calculate the Dq, B and ß parameters of complex. 10. To understand the Lewis and Bronsted Concept of Acids and Bases. 11.To apply knowledge of VBT & VSEPR theory for prediction structure of molecules.
CHETE/SE1509-DSE-3 Org. Chem 1. Understand the concept of Stereochemistry 2. Know the stereochemical notations 3. Know the difference between stereospecific and stereoselective reactions 4. Study the stereochemistry of some Chiral molecules like Biphenyls, allenes and Spiranes. 5. Acquire the knowledge of various methods of resolution 6. Understand stereochemistry of the	CHETE/SE/5 59-DSE-8 Course Objectives Student will be able to Understand aromatic electrophilic substitution reactions Acquire the knowledge of directing nature of functional groups Know directing nature of attacking

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compounds containing Nitrogen, Sulphur and phosphorous 7. Know about enantiomeric and diastercomeric excess	electrophiles on various aromatics Understand requirement for aromatic nucleophilic substitution reactions Describe the basic concepts in molecular rearrangement Acquire the knowledge of migratory apptitude
CHETTE/SE /510-DSE-4 Phy. Chem Course outcomes: after completion of the course Students will be able to solubility products. 1. To understand the concept of ionic equilibrium, dissociation constant, buffer solution and 2. To calculate dissociation constant, pH, pOH, pKa, pKb of acidic and basic solutions. 3. To understand the theories of electrolytes, electro capillary phenomenon and its properties. 4. To understand the concept of surface tension of liquid and curved surfaces.	CHETE/SE/5 60-DSE-9 Course outcomes: 1. To understand the basic concepts of phase rule 2. To analyse and interpret phase diagrams for single and multicomponent systems. 3. To understand the basic concept of crystallography. 4. To understand the basic concepts of photochemistry, their different theories and possible applications.
CHETE/SE 1511-DES-5 Drug Chemistry Course outcomes: after completion of the course Students will be able to 1. To understand the concept of ionic equilibrium, dissociation constant, buffer solution and solubility products. 2. To calculate dissociation constant, pH, POH, pKa, pKb of acidic and basic solutions. 3. To understand the theories of electrolytes, electro capillary phenomenon and its properties. 4. To understand the concept of surface tension of liquid and curved surfaces.	CHETE/SE/5 61-DSE-10 Course Outcomes: To provide details about Drugs, their characterization and classification To know about sources of drugs, historical development and other parameters such as Lead discovery, lead development; Pharmacological/Microbiological/Biochemical evaluation; Clinical trials; and Pharmacokinetic To provide the information about dosage forms, drug toxicity and it's prevention
CHE/RM-512 Research methodology Course outcomes: On completion of this course, the students will be able to: 1. Understand the basic concepts of research methodology 2. know recent trends in chemical research. 3. Acquire the fundamental knowledge of various	CHE OJT-562 Course outcomes: On completion of this course, the students will be able: Able to get on the job training

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characterization techniques. 4. apply of characterization techniques viz.; XRD, SEM, TEM, UV, IR, NMR and Mass spectrometry in research	
	CHE FP-563 Field Project Learning outcomes: On completion of this course, the students will be able: Get experiential learning while field work
M.Sc. II year, III semester- Organic Chemistry	M.Sc. II year, IV semester- Organic Chemistry

Program Outcomes:

The program outcomes (PO's) are the statement of competencies/ abilities. POs are the statement that describes the knowledge and the abilities the post-graduate will have by the end of program studies.

(i) In-depth and detailed functional knowledge of the fundamental theoretical concepts and experimental methods of chemistry.

(ii) Apply/implement interface between on the one hand, the history of chemistry and natural science and, on the other hand, issues pertaining to the areas of modern technology, health, and environment.

(iii) Skills in planning and conducting advanced chemical experiments and applying structural-chemical characterization techniques.

(iv) Skill in examining specific phenomena theoretically and/or experimentally.

(v) Generation of new scientific insights or to the innovation of new applications of chemical research.

9. Course Program outcome

Course Program Outcomes are developed through the curriculum (curricular/co- curricular-extra-curricular activities). The program outcomes are attained through the course implementation. As an educator, one must know, "To which POs his/her course is contributing?" So that one can design the learning experiences, select teaching method and design the tool for assessment.

OSNET-600 DSC-15 (org. Chem.) Course Outcomes: On the completion of course, students will be able to: 1. Review elementary concepts of nuclear magnetic resonance spectroscopy and delve into spin-spin couplings, factors affecting coupling constants, and spin systems like AB, AX, and ABX. 2. Explore techniques such as INEPT, INADEQUATE, and the Nuclear Overhauser effect.	OCHET-650 DSC-20 (org. Chem.) Course Outcomes: At the end of the course, the student will be able to: 1. Under the basic concepts of reyrosyntheticabnalysis 2. Describe disconnection approaches applied on synthetic strategies and mechanism prediction. 3. Understand the use of protecting groups

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3. Grasp elementary concepts of 13C NMR spectroscopy, including chemical shifts for various carbon types and the impact of substituents on these shifts. 4. Understand the fundamentals of mass spectrometry, including ion production methods, ion analysis, factors affecting fragmentation, and the interpretation of mass spectra. 5. Explore fragmentation patterns for various functional groups and phenomena like the molecular ion peak and McLafferty rearrangement. 6. Grasp the principles of Mössbauer spectroscopy, understanding factors influencing line position and shape, including the isomer effect and quadrupole splitting. 7. Integrate UV, IR, 'H NMR, 13C NMR and Mass data to solve complex and deduce thre structure.	4. Allow to disconnect the molecules by using different strategies 5. Explore the various reactions for designing the synthesis of target molecules 6. Allow to construct the various rings 7. Utilize the knowledge of retrosynthestic analysis and synthesis for natural products, drugs and complex molecules
OCHET-601 DSC-16 (org. Chem.) Course Outcomes: On the completion of course, students will be able to: 1. Exploremetal and non-metal basedoxidising agents for functional group transformations. 2. Understand the selectivity in the reagents for carrying oxidations 3. Learn the utility of the reagents 4. Explore the suitable methods to carry out oxidation and dihydroxylation 5. Explore the synthetic utility of various hydride transfer reagents for reduction of functional groups 6. Understand the preparation and applications of organic reagents for different types of reactions 7. Utilize the various organometallic reagents for carbon-carbon bond formations 8. Achieve the preparation of ylides and their synthetic utlity]	OCHET-651 DSC-21 (org. Chem.) Course Outcomes: At the end of the course, the student will be able to: 1. Understand the concept of structure elucidation of natural compounds 2. Build the synthetic schemes of natural products and bioactive molecules 3. Analyze the stereochemistry of drug molecules 4. Apply the knowledge of biosynthesis in total synthesis of organic molecules. 5. Design new synthetic methodologies 6. Understand the concepts involved in asymmetric synthesis
OCHET-602 DSC-17 (org. Chem.) Course Outcomes: On the completion of course, students will be able to:	OCHET-652 DSC-22 (org. Chem.) Course Outcomes: At the end of the course, the student will be able to:

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1. Understand the photochemical and thermal reactions 2. Classify the various types of pericyclic reactions 3. Apply the orbital correlation and frontier molecular orbital methods for pericyclicreactions 4. Predict the stercochemical outcome of pericyclic reactions 5. Understand various free radical reactions	1. Classify heterocyclic compounds and their nomenclature 2. Understand the physical and chemical properties of simple and fused heterocyclic compounds 3. Apply the knowledge of heterocyclic chemistry to synthesize the natural products and drug molecules 4. Distinguish aromatic and homoaromatic compounds using spectral data
OCHET-603 DSC-18 (org. Chem.) Course Outcomes: On the completion of course, students will be able to: 1. Understand the multistep organic synthesis 2. Explore the theoretical knowledge to predict the mechanism of reactions 3. Explore the purification techniques 4. Allow carry out various reactions 5. Determine the overall yield of the reaction	OCHET-653 DSC-23 (org. Chem.) Course Outcomes: At the end of the course, the student will be able to: 1. Understand the principles involved in separation and purification techniques 2. Analyze the functional groups in organic molecules 3. Understand the principles involved in separation of ternary mixtures 4. Obtain practical experience in the separation and identification of individual compounds in the ternary mixtures 5. Develop the knowledge and skills in the synthetic organic chemistry useful for industrial applications
OCHET-604 DSC-19 (org. Chem.) Course Outcomes: On the completion of course, students will be able to: 1. Understand the the use of green chemistry principles 2. Explore the use of microwave and ultrasound irradiation technique for the synthesis 3. Explore the purification techniques 4. Carry out various reactions 5. Utilize the knowledge of spectroscopic techniques for structure ilucidation	OCHET-654 DSC-24 (org. Chem.) Course Outcomes: At the end of the course, the student will be able to: 1. Understand basic concepts of drug discovery. 2. Apply the concepts in lead discovery. 3. Identify the importance of Lipinski rule and bioisosterism. 4. Understand the concept of Pharmacokinetics and Pharmacodynamics

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OCHEL-605 DSC-20 (org. Chem. Lab course)	OCHEL-655 DSC-25 (org. Chem. Lab course) Course Outcomes: At the end of the course, the student will be able to: 1. Understand classification of drugs. 2. Explore the knowledge of pharmacokinetics and dynamicsof the drugs 3. Understand the mode of action of drugs. 4. Explore the knowledge of synthetic organic chemistry to drug synthesis
OCHEL-606 DSC-21 (org. Chem. Lab course)	OCHETE- 656 DSE-13 (org. Chem)
OCHETE- 607 DSE-9 (org. Chem) Course Outcomes: On the completion of course, students will be able to: 1. Understand the photochemical and thermal reactions 2. Classify the various types ofphotochemical reactions 3. Predict the stereochemical outcome of photochemical reactions 4. Understand the concept of green chemistry 5. Utilize the knowledge of Microwave and Ultrasound assisted reactions for bioactive molecules	OCHETE- 657 DSE-14 (org. Chem)
OCHETE- 608 DSE-10 (org. Chem) Course Outcomes: On the completion of course, students will be able to: 1. Understand the types of reactions and rearrangements 2. Predict the applications of named reactions and rearrangements in organic synthesis particularly natural products and drugs. 3. Allow to utilize the concept of carbon-carbon single and multiple bonds	OCHETE- 658 DSE-15 (org. Chem) Course Outcomes: At the end of the course, the student will be able to: 1. Understand the basic concepts in Polymer chemistry. 2. Learn the determination of molecular weight and properties of polymers. 3. Know about the polymer processing and polymerization techniques. 4. Explore synthesis and applications of

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4. Understand the concept of Multicomponent reactions and their utlity	commercial polymers and conducting polymers.
OCHETE- 609 DSE-11 (org. Chem) Course Outcomes: On the completion of course, students will be able to: 1. Understand the concept of bioorganic chemistry 2. Know about the types of enzymes, structures. 3. Understand the applicability of various enzymes	OCHETE- 659 DSE-16 (org. Chem) Course Outcomes: At the end of the course, the student will be able to: 1. Analyze the concepts of 'F spectroscopy in determining the structures of molecules. 2. Apply the principles of 2D NMR spectroscopy in resolving the structures of organic molecules. 3. Discuss the principle of 31P and mass spectrometry and their applications. 4. Solve the structures of organic compounds using spectral data.
OCHETE- 610 DSE-12 (org. Chem) Course Outcomes: At the end of the course, the student will be able to: 1. Understand the concepts of multicomponent reactions and their mechanisms. 2. Understand the tandem reactions in organic synthesis. 3. Apply the principles of click chemistry in drug discovery, biology and materials chemistry. 4. Discuss the flow chemistry, micro reactors, separation techniques and process chemistry in organic synthesis.	
OCHE-RP- 649 Research Project -1 Course Outcomes: At the end of the course, the student will be able to: 1. Know how to carry out literature survey by using various search engines and database 2. Handle various chemicals, solvents, instruments and others 3. Perform reactions, monitoring by TLC 4. Purification techniques 5. Understand the structure of organic compounds	OCHETE- RP-699 Research Project-2 Course Outcomes: At the end of the course, the student will be able to: 1. Know how to carry out literature survey by using various search engines and database 2. Handle various chemicals, solvents, instruments and others 3. Perform reactions, monitoring by TLC 4. Purification techniques

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by using spectral techniques	5. Understand the structure of organic compounds by using spectral techniques

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Common courses/compulsory courses

AEC1- English AEC2-Englsih
Ability Enhancement Course (AEC-1)

ACE-1. Course Title: Contmunication Skills in English

Course Outcome:

At the end of course, students will learn

To communication skills, importance of all skills and use of effective communication skills.

To speak at public places.

To prepare for job interview

Manners, etiquettes, and maintain good relations with others

To show higher level of critical thinking and sharpen their accuracy in writing.

CC- Health and Wellness

Outcomes:

1. After completion of first unit the students will have the conceptual idea about health and wellness with respect to physical, mental, social and emotional also they are enlightened with the lifestyle of an individual with hypo-kinetic diseases.

2. The students will have clear idea about the nutritional aspects viz. balance diet, malnutrition and harmful effects of ergo-genic aids.

3. The students can make out about the awareness of obesity, overweight, underweight etc. and how to deal with these problems.

4. Through implementation of practical the students will able to apply the theoretical knowledge into practicality through the assignments and practical projects.

CC2-Yoga education/ Sports & Fitness
Course Out Comes:

1. The students can awareness about physical fitness and sports participation.

2. To increase self confidence of students.

3. Develop sport attitude among the student.

4. The students will have the conceptual idea about health and fitness through sports and games.

5. The students will able to apply the theoretical knowledge into practicality through the assignments or practical projects.

Environment studies
Course Outcomes:

Students should be able to

1. Identify the status of natural resources and the value of biodiversity.

2. Describe in-situ and ex-situ conservation measures of biodiversity and endangered species in India.

3. Renewable energy use for sustainable green growth such as use low carbon vehicles, green choice and green living.

4. Environmental pollution measures, solid and hazardous waste management and the global environmental issues.

IKS Indian Knowledge system
Course Title: Saints and Saint Literature of Marathwada
Outcomes:

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Previous understanding of Maratha language, culture, religion, society and saint literature.
2. Because of the value edition, sentimentality,
2. Bichar shrirmati flood.
4. Scientific approach will take root.
Linguistic and Instrumental: Comprehension of Gayinguna.

IKS 02
Course Title: Historic Architectural Heritage in Marathwada
Course Outcomes:
1. To introduce the Historic Architectural Heritage of Marathwada.
2. To understand various Historic Architectural Heritage & their importance, in the history of Marathwada.
3. To acquaint the students with the relevance and scope of historic architectural heritage.

Code: IKS 02
Course Handicrafts of Marathwada
Course Outcomes:
Students will be enabled to develop critical research aptitude in understanding the historical traditions, cultural value, ecological strength and commercial utility of the handicrafts of the Marathwada:
1. Relate principles of Indigenous knowledge to professional career field in the commercial and corporate sectors through handicrafts
2. Analyze the impact of new market systems on crafts and how we could rebuilt utility of handicrafts in the Marathwada
3. Explain the relationship between regional ecology, and its cultural identity within Indigenous handicraft systerns
4. Compare Indigenous knowledge systems of crafts and its perceptions of inclusion and diversity

IKS 02
Course Title: World Heritage Sites of Marathwada
Course Outcomes:
3. To Study the Basic concept of Cave temple.
4. To create awareness about Ellora and Ajanta Cave.
5. To put forth importance of cave architecture & sculpture in Ellora and Ajanta.

IKS 02
Course Title: Forts of Marathwada
Course Outcomes:
1. Explain the importance of Forts.
2. Study of Forts in Marathwada
3. Creating public awareness about the fort in Marathwada.

Course Title: Hyderabad Freedom Struggle (Marathwada Region)
Course Outcomes:
1 To give basic Knowledge about Hyderabad Freedom struggle among the student. 1
2. To enable to locate the difference between Indian freedom struggle and Hyderabad liberation movement.
3. To make aware the students about heritage places of Marathwada Mukti Sangram.
4. To make aware the students about heritage places of Marathwada Mukti Sangram.
5. To groom the student in knowing the importance of regional history of Marathwada.

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