|| विद्या विनयन शोभते||

Janardan Bhagat Shikshan Prasarak Sanstha's

CHANGU KANA THAKUR

ARTS, COMMERCE AND SCIENCE COLLEGE, NEW PANVEL
(Autonomous)

Re-accredited 'A+' Grade by NAAC (Third Cycle- 3.61 CGPA)

'College with Potential for Excellence' Status Awarded by University Grants Commission

'Best College Award' by University of Mumbai

Programme Outcomes

Academic Year 2022-2023

Internal Quality Assurance Cell (IQAC)

Faculty of Arts

Programme- B.A.

Programme Outcomes

PO1   To enable the students to understand fundamental concepts in History, Geography, Economics, English, Political Science, Hindi and Marathi subjects respectively

PO2   To acquaint the learners with various genres of Marathi, Hindi and English literature

PO3   To understand the relationship between literature and society and reflection of Universal truths

PO4   To appreciate world classics in the realm of British, American and Indian Literature

PO5   To develop communication skills amongst the students for better employability

PO6   To make learners sensitive about environment issues and sustainable development

PO7   To understand importance of social, political, economic ethical and human values in life

PO8   To enable the learners to think logically and bridge the gap between local and global environment

PO9   To make the students to have better personality traits

Department of English

Programme Specific Outcomes

PSO1 To appreciate world classics in the realm of English Literature.

PSO2 To recognize importance of historical perspectives while studying literature.

PSO3 To understand salient traits of different schools of poetry.

PSO4 To develop interpretative and critical skills of the learners.

PSO5 To explore the reflection of human values in literature

Department of Economics

Bachelor of Arts

Programme Specific Outcomes

PSO1   Students will able to understand the basic concepts of economics.

PSO2   Students will learn the application of different concepts of economics in practical field.

PSO3   Students will able to appear in different fields of economics.

PSO4   Students can participate in various examinations linked to economics.

Department of Hindi

Programme Specific Outcomes

PSO1 पाठ्यक्रम की समाप्ति पर विद्यार्थियों में अग्रलिखित योग्यता विकसित हो जानी चाहिए।

PSO2 हिंदी की विभिन्न विधाओं के बारे में सुसंगत और प्रभावी समझ निर्माण होनी आवश्यक है।

PSO3 हिंदी के क्षेत्र में विद्यार्थियों की समझ और रूचि विकसित होनी चाहिए।

PSO4 व्यावहारिक हिंदी और इसके व्यावसायिक अनुप्रयोग में बुनियादी कौशल विकसित करना।

PSO5 पाठ्यक्रम के माध्यम से विद्यार्थियों में सामाजिक, राजनीतिक, धार्मिक, सांस्कृतिक विश्वदृष्टि का विकास होगा।

PSO6 विद्यार्थियों में रसास्वाद के कौशल का विकास होगा।

PSO7 हिंदी हेतु उपलब्ध रोजगारों के लिए आवश्यक गुणों का विकास होगा तथा ज्ञानात्मक आधार पुष्ट होगा।

Department of Geography

Programme Specific Outcomes

PSO1   Understand, coherently and effectively about various genres of Geography.

PSO2   Understanding the diverse concepts in the field of Geography.

PSO3   Understand global and regional patterns of cultural, political and economic institutions, and their effects on exploitation of natural resources and landscapes.

PSO4   Understand need for protection and conservation of natural recourses.

PSO5   Develop basic skills in practical Geography and its industrial applications.

Department of History

Programme Specific Outcomes

PO1   To understand the background of social, economic, religious, cultural and political life of people and compare it with present to achieve overall development of society.

PO2   The study of history impart the knowledge of the significant historical events and past mistakes and create awareness for avoid the mistakes in present for better future with peace, progress in diverse and global community.

PO3   History instil the idea of national integration and harmony as well as generates the feeling of nationalism and patriotism.

PO4   History develop curious approach and interest for historical facts, art and architecture, archaeological sites, museums and archives as the sources for research in history

Programme- M.A.

Programme Outcomes

PO1   To understand the relationship between literature and society and reflection of universal truths

PO2   To appreciate world classics in the realm of English Literature.

PO3   To understand various consequences of gender discrimination

PO4   Students will able to understand the basic concepts of economics and can enter in the variety competitive services.

PO5   Students will learn the application of statistics and Econometrics in Economics and able to estimate the performance of the Economy and various sectors

Department of English

Programme Specific Outcomes

PSO1 To appreciate world classics in the realm of English Literature.

PSO2 To empower the students with research aptitude and creative writing.

PSO3 To understand various consequences of gender discrimination.

PSO4 To enhance analytical and evaluative skills of the learners.

PSO5 To examine reflection of universal truths in the realm of literature.

Department of Economics

Programme Specific Outcomes

PSO1   Learners will able to understand the concepts of economics and can enter in the variety competitive services.

PSO2   Learners will learn the application of Mathematics and Statistics in economics and able to estimate the performance of the various sectors.

PSO3   Learners can appear for further research work in economics.

PSO4   Learners can appear for NET and SET.

PSO5   Learners can work as assistant professor at degree college.

PSO6   Students can start their own business in the market.

Department of Hindi

Programme Specific Outcomes

PSO1   Understanding the relation between society and literature and analyse the role played by Hindi literature in past and present.

PSO2   Understanding the strategy of converting worship into the movement of struggle for cultural freedom.

PSO3   Developing skill of writing official letters in functional Hindi.

PSO4   Developing philosophy of life inspiring by the vision of eminent writers.

PSO5   Gaining socio cultural consciousness.

Faculty of Arts

SEMESTER I

A. Economics

Course (Paper) Name and No.: Micro Economics

CO1   Understand basic theories of micro economics.

CO2   Define ten principle of economics

CO3   Calculate the market demand and market supply.

CO4   Analyse the consumer's behaviour with the help of indifference curve.

B. English

Course (Paper) Name and No.: Communication Skills in English

CO1   Choose correct use of grammatical units

CO2   Develop quick and efficient reading techniques in order to achieve academic performance

CO3   Classify the different use of formal correspondence in the rapid era of information technology

CO4   Explain the mechanism of interpretation of technical data by using different methods

C. Hindi

Course (Paper) Name and No.: Hindi (Compulsory)

CO1   Recall and name various aspects of Hindi grammar and linguistics

CO2   Relate and describe distinct social awareness as expressed by eminent writers in their stories and poems

CO3   Classify and compare the distinct style of writing expressed by various writers.

CO4   Summarise and explain the comparative aspects using vocabulary

D. History

Course (Paper) Name and No.: History of Modern India (1857 C.E. to 1947C.E.)

CO1   Illustrate the importance of revolt of 1857 and its significance to create awareness about the freedom

CO2   Adopt the process of healthy nationalism and secularism by studying work of social reformers and freedom fighters.

CO3   Student will be able to outline the whole process of freedom struggle

CO4   Students will be able to explain the process of rise of modern India.

E. Marathi

Course (Paper) Name and No.: Marathi Compulsory

CO1   विद्यार्थ्यांमध्ये मराठी भाषेविषयी आवड निर्माण होईल

CO2   विद्यार्थी दैनंदिन जीवनात मराठी भाषेचा वापर अधिक निर्दोष व आत्मविश्वासाने करतील

CO3   विद्यार्थी कार्यालयीन कामकाजात मराठी भाषेचा वापर अचूकपणे करतील

CO4   विद्यार्थ्यांना विविध माध्यमांसाठी सर्जनशील लेखनाचे कौशल्ये प्राप्त होईल

CO5   विद्यार्थी संस्कारक्षम बनतील

Course (Paper) Name and No.: Marathi (Optional) Paper I

CO1   विद्यार्थ्यांमध्ये मराठी भाषा व साहित्य यांविषयी आवड निर्माण होईल

CO2   मराठी साहित्यातील नाटक या वांड्मय प्रकाराची ओळख होईल

CO3   विद्यार्थ्याला वास्तव आणि नाटक यातील फरक समजेल

CO4   मराठी साहित्यातील नाटककारांचा परिचय होईल

SEMESTER II

A. Economics

Course (Paper) Name and No.: UAR2EC1 Micro Economics

CO1   Relate types of production and producers equilibrium.

CO2   Explain cost and revenue and interrelationship.

CO3   Develop theories of factor pricing.

CO4   Compare equilibrium in different market structures.

B. English

Course (Paper) Name and No.: Communication Skills in English II

CO1   Find out multiple ways of vocabulary enrichment to improve communicative competence

CO2   Develop different highly effective and accurate writing skills

CO3   Appraise E-mail writing techniques for quick and precise for better communication

CO4   Improve the artistic and imaginative skills of different types of writing

C. Hindi

Hindi Compulsory

CO1   Tell about life journey of writers and poets covered in the syllabus

CO2   Explain key learnings conveyed in the stories and poems covered

CO3   Translate from one language to another eg. Marathi to Hindi

CO4   Apply the basic grammar learned

D. History

Course (Paper) Name and No.:   History of Modern India (1857 C.E. to 1947C.E.)

CO1   Illustrate the seeds of Nationalism where sown in socio-religious reform movements.

CO2   Analyse the role of western education and Newspapers in freedom struggle in India

CO3   Learners will developed idea about the impact of the British Rule on Indian Economy.

CO4   To assess the development of Subaltern factors in the History of Modern India.

E. Marathi

Course (Paper) Name and No.: Marathi Compulsory

CO1   विद्यार्थ्यांना नामवंत लेखकांच्या लेखनाचा परिचय होईल

CO2   विद्यार्थ्यांना श्रवण, वाचन, भाषण, लेखन, इ. भाषिक कौशल्ये आत्मसात होतील

CO3   शालेय शिक्षणात नापास झालेली माणसेही जीवनात उत्तुंग भरारी कसे घेतात ते समजेल

CO4   चरित्र, आत्मचरित्र, आत्मकथा इ. साहित्यातील लेखनप्रकाराची ओळख होईल

Course (Paper) Name and No.: Marathi (Optional) Paper I

CO1   विद्यार्थ्यांना कविता या वांड्मय प्रकाराचा परिचय होईल

CO2   विद्यार्थ्यांना मराठी साहित्यातील प्रमुख कवींचा व त्यांच्या कवितांचा परिचय होईल

CO3   विद्यार्थ्यांना मराठी साहित्यातील विविध प्रवाहांचा परिचय होईल

CO4   विद्यार्थ्यांना मराठीतील सर्जनशील लेखनाची पूर्व तयारी होईल

SEMESTER III

A. Economics

Course (Paper) Name and No.: (Economics) Public Finance

CO1   Find out the public Finance and Private

CO2   Compare Budget and Taxation

CO3   Distinguish between public Expenditure and debt

CO4   Interpret the Indian Public Finance

Course (Paper) Name and No.: (Economics) Demography

CO1   Show the nature of Indian Population

CO2   Relate the theories of population

CO3   Assess the sources of demographic data in India

CO4   Choose the appropriate methods of calculation

Course (Paper) Name and No.: (Economics) Macro Economics

CO1   Define the concepts of Macro Economics and National Income

CO2   Interpret the theories of consumption and investment

CO3   Distinguish between supply of money and demand for money

CO4   Compare the banking structure in India

B. English

Course (Paper) Name and No.: Literature in English_UAR3EG2

CO1   Select the literary masterpieces and gems of Indianwriting in English and flourish necessary skills

CO2   Identify the significance of Indian literatures inEnglish and its manifold relevance in the dynamic world

CO3   Evaluate pluralistic approach and philosophicalperspectives of Indian Literatures in English

CO4   Adapt moral, ethical and social values to besocially responsible and intellectually alive

Course: American Literature _ _UAR3EG3

CO1   Identify literary terms of twentieth century ofAmerican Literature

CO2   Analyse themes reflected in African Americanfiction

CO3   Perceive   gender   equality   through   prominentstories pertaining to American literature

CO4   Relate human values depicted through literaryworks in the realm of American Literature

C. Geography

Course (Paper) Name and No.: (Geography) Introduction to Climatology II

CO1   Understand the nature, scope, branches and concepts of climatology as well as the structure of atmosphere.

CO2   Understand the weather phenomena, winds and upper air circulation.

CO3   Understand the concept of humidity, condensation, precipitation and analyze the distribution of rainfall.

CO4   Understand the cyclones, Indian monsoon and evaluate the climate change issues.

CO5   Read and interpret the weather map and to construct the climatic diagrams.

Course (Paper) Name and No.: (Geography) Physical Geography of India III

CO1   Understand the physiographic divisions of India and its importance.

CO2   Understand and analyze the drainage system in India.

CO3   Explain the types of seasons, soil and forest in India and to evaluate the conservation methods.

CO4   Classify and explain the minerals and energy resources in India.

CO5   Mark the geographical features in the map of India and construct the map scale.

D. Hindi

Course (Paper) Name and No.: Medieval and Modern Poetry, Paper-II _UAR3HN2

CO1   Explain uniqueness in the writing styles used by medieval poets.

CO2   Relate and summarise the prevailing social scenarios expressed in medieval and modern poetry

CO3   Distinguish the uniqueness in the language of poetry of Medieval and Modern era. Eg- Braj Bhasha, Avadhi, Khadi Boli etc.

CO4   Categorise the poetry of Medieval era Eg. Saints - Sufi and Ram - Krishna Bhakti poetry

Course (Paper) Name and No.: Modern Prose   _UAR3HN3

CO1   उपन्यास का अध्ययन करने से छात्रों में भारतीय समाज में किसानों का हो रहा शोषण, दलितों की दीन-हीन दशा, जमींदारों के अत्याचार, उत्पीडन, शोषण, आपसी ईर्ष्या-द्वेष भावना, समाज की परिवर्तनशील अवस्था, नेताओं की स्वार्थी वृत्ति, किसानों की साम्यवाद के प्रति सहज आस्था की भावना को समझने की क्षमता में वृद्धी होगी ।

CO2   उपन्यास का अध्ययन करने से छात्रों में तत्कालीन राजनीतिक, साम्राज्यवादी नीति, भारतीय समाज में चल रहा सामान्य लोगों का शोषण, उत्पीडन, स्वतन्त्रता प्राप्ति में लोगों का योगदान, भारतीय रुपयों का अपव्यय किस प्रकार हो रहा हैं इन सभी बातों को संप्रेषित कर सकेंगे ।

CO3   हिंदी कहानिओं के अध्ययन करने से छात्र 'रघुकुल रीति सदा चली आई, प्राण जाये पर वचन न जाईं' निश्चल प्रेम, प्रणपालक, त्याग और बलिदान भारतीय सड़ांध समाज-व्यवस्था, दलित अस्मिता, नारी अस्मिता, मध्यमवर्गीय समाज का खोखलापन, दो पीढ़ियों का संघर्ष को सुलझा सकेंगे ।

CO4   हिंदी कहानिओं के अध्ययन करने से छात्र भारतीय सौंदर्य चिन्तन, पाश्चात्य सौंदर्य चिन्तन, और मार्क्सवादी सौंदर्य चिन्तन के बीच निर्मित होते दलित सौंदर्य चिन्तन के विचार बिन्दुओं की परख कर सकेंगे।

E. History

Course (Paper) Name and No.: Ancient India from Earliest Times to 1000 AD

CO1   Students will have better understanding of ancient period of Indian history.

CO2   They will be able to trace the continuity and change in historical perspective.

CO3   To understand the spiritual philosophy related to life through the study of ancient India

CO4   It will induce students to history of India In chronological framework.

Course (Paper) Name and No.: Landmarks in World History II

CO1   The Learners will be able to understand the significant historical events of the world.

CO2   The Learners understand how the whole world came out of the medieval dark ages.

CO3   The learners was aware of the Revolutions which gave very important concepts to world.

CO4   To understand the effects of global change on human life.

F. Marathi

Course (Paper) Name and No.: Marathi Paper II

CO1   कादंबरी या साहित्यप्रकाराची तोंडओळख होईल

CO2   विद्यार्थ्यांच्या वांङ्मयीन अभिरुचीचा विकास होईल

CO3   मराठी साहित्याभ्यासातून जीवनविषयक समज विकसित होईल

CO4   विद्यार्थ्यांमध्ये मराठी साहित्याबद्दलची अभिरुची विकसित करून कलाकृतीचा आस्वाद घेण्याची क्षमता
       वाढेल

CO5   नेमलेल्या कलाकृतीच्या संदर्भात साहित्य परंपरेचा स्थूल परिचय होईल

CO6   साहित्य आणि समाज यातील परस्परसंबंध समजावून घेता येईल

Course (Paper) Name and No.: Marathi Paper III

CO1   भाषेचे स्वरूप व कार्य, भाषेच्या अभ्यासाचे महत्व, भाषेच्या अभ्यासाचे प्रमुख अंगे समजून येतील

CO2   भाषा म्हणजे काय व तिचे मानवी जीवनातील कार्य व महत्व समजून येईल

CO3   भाषेचे यथोचित आकलन व वापर करण्याची क्षमता विकसित होईल

CO4   भाषेची निर्मिती प्रक्रिया समजण्यास मदत होईल

CO5   भाषेच्या वापराचे ज्ञान मिळेल

G. Political Science

Course (Paper II) Name and No.: Political Theory

CO1   Analyzing what is Political Theory meaning and scope and explaining the approaches
       to the Study of Political Theory – Traditional and Contemporary Approaches.

CO2   Assessing the theories of State, (Origin, Nature, Functions): Contract, Idealist,
       Liberal and Neo-Liberal Theories.

CO3   Explaining the Concept of nation, Factors of Nation, Civil society, Market.

CO4   Understanding basic concepts of Power and Authority and Legitimacy.

CO4   Understanding basic concepts of Liberty, Equality, Rights, Law and Justice.

CO6   Understanding basic concepts of Political Obligation and Right to Resist.

Course (Paper III) Name and No.: Public Administration

CO1   Explaining the meaning, nature, scope and evolution of Public Administration; Private and Public Administration.

CO2   Analyse the major Theories in Public Administration.

CO3   The Challenges in the discipline of Public Administration like New Public Administration (NPA), New Public Management (NPM)

CO4   Discussing Weberian theories of bureaucracy, Human Relation Theory (Elton Mayo), Scientific management Theory (F.W.Taylor).

H.   Rural Development

Course (Paper) Name and No.: Rural Development II _UAR3RDII

CO1   Describe the concept, Reasons and components of Indian Rural Society, Problems of Weaker Section, Rural Social Institution and Social Change.

CO2   Identify the problems of Indian Rural Society, Rural social Institution, Modernization and Westernization.

CO3   Analyse the concept related to social change, changes in Society, Impact Rural Community on Urban Community.

CO4   Explain   the concept related to social change, Reasons, Barriers in social change, Rural Social Institutions and Indian Rural Society,

Course (Paper) Name and No.: Rural Development III _UAR1RDIII

CO1   Describe the Basic concept, objectives, Components, Background of District Admiration, Revenue Administration, Law and Order, Judicial Machinery and Planning for Rural Development,

CO2   Examine the role of District and Revenue Administration, NGOS in Rural Planning, Law and Order and Judicial Machinery in Rural Administration.

CO3   Explain the Structure, Functions, Scope and Types of Districts and Revenue Administration, planning, Law and order and Judicial Machinery.

CO4   Discuss on Law and Order, Loknyayalaya, District Planning, Revenue and District Admiration.

I. NCC

Course (Paper) Name and No.: Foundation Course in NCC III

CO1   Describe National integration &environmental conservation

CO2   Explain concepts of personality development & Leadership

CO3   Classify different movements of foot drill

CO4   Apply the knowledge weapon training & drill in military training

SEMESTER IV

A. Economics

Course (Paper) Name and No.: (Economics) Indian Economy

CO1   Define the various concepts of Indian economy

CO2   Explain the agriculture policies.

CO3   Identify the various programmes for Industrial Development

CO4   Examine the role and nature of service sector in India

CO5   Define the various concepts of Indian economy

Course (Paper) Name and No.: (Economics) Demography

CO1   Explain the concept of fertility, Nuptiality, Mortality and Life Table

CO2   Choose the theories of Migration

CO3   Examine urbanization and problems of urbanization in India

CO4   Evaluate the population Policy

Course (Paper) Name and No.: (Economics) Macro Economics

CO1   Find the inflation in Indian economy

CO2   Relate the monetary and fiscal policy in India

CO3   utilize post Keynesian Theories of Economics

CO4   Examine the relationship between domestic economy and External sectors

B. English

Course: Indian Literature in English_UAR4EG2

CO1   Explain the uniqueness of Indian Literature inEnglish

CO2   Develop literary skills, techniques and multiple ways of interpretation of prominent texts of Indianwriters

CO3   Compare indigenous and the independent status of Indian writing in English in the realm of world Literature

CO4   Improve constant habits of learning andappreciation of Indian classics in English

Course: American Literature_UAR4EG3

CO1   Classify literary concepts and salient tenets of American dream incorporated in literary genres

CO2   Develop quest for materialism through theprotagonist delineated in American drama

CO3   Examine racial discrimination represented inAfrican American poetry

CO4   Explain feministic ideology depicted in Americanpoetry

C.   Geography

Course (Paper) Name and No.: (Geography) Introduction to Oceanography II

CO1   Explain the origin, nature, scope and branches of Oceanography.

CO2   Explain the structure of ocean floor, composition, temperature and salinity of ocean water.

CO3   Understand the tide formation and ocean currents. Evaluate the effects of ocean currents.

CO4   Explain the oceanic phenomenon and the marine ecosystem.

CO5   Mark the geographical features in the map and to read and interpret the navigation charts bathymetrical maps.

Course (Paper) Name and No.: (Geography) Agriculture Geography of India III

CO1   Understand the nature, scope and approaches of Agriculture Geography. Explain the importance salient features of agriculture in India.

CO2   Explain the factors, types, major crops and problems of agriculture in India.

CO3   Understand the components and impacts of green revolution in India and to evaluate the present scenario of green revolution.

CO4   Explain the development of recent trends of agriculture in India.

CO5   Interpret the thematic maps and construct the statistical diagrams and graphs.

D. Hindi

Course (Paper) Name and No.: Hindi-II मध्ययुगीन एवं आधुनिक कविता_UAR4HN2

CO1   Explain uniqueness in the writing styles used in Ghazal written by Dushyant Kumar

CO2   Outline the prevailing key social and political issues of India covered in the Ghazals of Dushyant Kumar

CO3 Analyse the poems of different poets of Modern era and their writing styles

CO4 Categorise the poems of Modern era in different categories like Pryogvadi , Dalit vimarsh etc.

Course (Paper) Name and No.: Modern Prose _ UAR4HN3

CO1 नाटक का अध्ययन करके छात्र ऐतिहासिक त्रासदी के आधार पर समसामयिक द्वंद्व, कलाकार के स्वाभिमान की रक्षा, अत्याचारों का विरोध करने की प्रेरणा, महाशिल्पी और शिल्पियों के संघर्ष का स्पष्टीकरण कर पायेगा।

CO2 नाटक यह विधा मानव –मन की उद्वेलित भावनाओं, रंगमंचीयता के विविध उपकरण, भारतीय संस्कृति, इतिहास, समकालीनता तथा मानवीय सत्य की आस्था को परिपुष्ट करने की क्षमता को वृध्दिगत कर पायेंगे।

CO3 एकांकी साहित्यिक विधा के अध्ययन से छात्र आधुनिक समाज की दिखावे की संस्कृति तथा समाज की विकृति, परंपरा और आधुनिकता के द्वंद्व, जीवन में बनावटीपन को नहीं यथार्थ को महत्व, एक-दूसरे की भाव-भावनाओं का सम्मान, धुम्रपान के प्रति अपना मत प्रस्तुत कर सकेंगे ।

CO4 एकांकी साहित्यिक विधा के अध्ययन से छात्र मानसिक विकलता, धर्म के नाम पर धोखा, मानवीय विसंगतियाँ, आर्थिक असमानता, मजदूर वर्ग की पीड़ा, मूल्य हीनता, नारी पीड़ा, टूटते रिश्ते, संयुक्त परिवार में मुखिया का महत्व, आदि सामाजिक पहलुओं की आलोचना कर सकेंगे ।

E. History

Course (Paper) Name and No.: History of Ancient India

CO1 The course will enable the students to study the history of ancient India from an analytical perspective

CO2 It will acquaint the student with various approaches and interpretation of ancient history of India

CO3 The learners are made aware of the glorious era in the history of ancient India

CO4 The learners can be introduced to the art and architecture of south India

Course (Paper) Name and No.: Landmarks in World History

CO1 The syllabus will enable the students to critically analysis of totalitarian rules ress

CO2 The learners will understand about global events during two world wars and their impact on the world

CO3 They understand how arms race poses a threats to word peace and progress

CO4 Explaining the International Nationalism to students through this course

F. Marathi

Course (Paper) Name and No.: Marathi Paper II

CO1   चरित्र, आत्मचरित्र, आत्मकथन या साहित्य प्रकारच्या तात्विक घटकांचे व अंतर्गत फरकाचे ज्ञान होईल

CO2   आधुनिक मराठी साहित्यातील निवडक चरित्र, आत्मचरित्र, आत्मकथा यांचा आकलन, आस्वाद आणि मूल्यमापन करण्याची क्षमता विद्यार्थ्यांमध्ये निर्मल होईल

CO3   चरित्र, आत्मचरित्र, आत्मकथन यातील वास्तव आणि कल्पित यातला फरक समजेल

CO4   चरित्र, आत्मचरित्र, आत्मकथन यातून माणसाचे जीवन संघर्ष समजून येईल

Course (Paper) Name and No.: Marathi Paper III

CO1   स्थानिक बोलीभाषेची माहिती होईल

CO2   बोलीभाषेतील साहित्य, संस्कृतीची अभिरुची निर्माण होईल

CO3   बोलीभाषेतील उच्चार प्रक्रिया, म्हणी, वाक्यप्रचार, शब्दसंग्रह इ. चा परिचय होईल

CO4   वेगवेगळ्या बोलीभाषेतील अंतर्गत फरक समजून येईल

CO5   बोलीभाषा आणि प्रमाण भाषा यातील फरक समजण्यास मदत होईल

G. Political Science

Course (Paper II) Name and No.: Political Values and Ideologies

CO1   To demonstrate knowledge of key Ideology and concepts.

CO2   To understand the nature, methods and significance of political values and Ideology

CO3   Examining the basic Tenets of Marxism and Fascism.

CO4   Classifying the three waves of Feminism.

Course (Paper III) Name and No.: Indian Administration

CO1   Explaining the meaning, nature, scope and evolution of Indian Administration.

CO2   Analyzing the major concept in Indian Administration.

CO3   Understanding the concept of District Administration in India.

CO4   Analyzing the Civil Service in India. Explaining the Planning and Planned Administration in India. Continuity and Change in Indian Administration.

H. Rural Development

Course (Paper) Name and No.: Rural Development II: UAR4RDII

CO1   Describe the Basic concept, objectives, Components, Importance, Functions of Agricultural Development, sources of Rural Employment and Tourism Development.

CO2   Identify the Areas of Rural Upliftment, problems in Tourism Industry, Agro processing Industry and Rural Marketing and Finance.

CO3   Examine the role of National Agricultural policy and food security, KVK and Agricultural University, Agro based Industries, Commerce and Trade and areas of Rural upliftment.

CO4   Explain the Sources of Rural Employment, Areas of Rural Upliftment, importance Agriculture Development and tourism development.

Course (Paper) Name and No.: Rural Development III_Course Code: UAR4RDIII

CO1   Describe the Historical Background, Role of laws related to Rural Development

CO2   Examine the role of Panchayat Act, Land Reforms and Law related Rural and Tribal Area.

CO3   Explain the Panchayat Raj Act in Maharashtra, Land Reforms and Laws related to Tribal and Rural Area.

CO4   Discuss the panchayat raj act in Maharashtra, Tribal and Rural Act, Land Reforms Legislation

I. NCC

Course (Paper) Name and No.: Foundation Course in NCC IV

CO1   Describe the concepts of disaster management, social awareness& Community development.

CO2   Explain about health hygiene, first aid & home nursing.

CO3   Classify drill & drill with arms

CO4   Apply the knowledge of weapons, map reading in military training.

SEMESTER V

A. Economics

Course (Paper) Name and No.: Micro Economics -IV

CO1   Learners understand the monopoly situation.

CO2   Learners are able to discriminate how the monopoly and oligopoly.

CO3   Learners are studied the equilibrium concept and social welfare of the people.

CO4   Learners are studied the Nash equilibrium

Course (Paper) Name and No.: Economics of Development -V

CO1   Learners will get familiar with concepts of growth and development.

CO2   Learners will able to understand the role of factors of development.

CO3   Learners will study effects of poverty, inequality on development.

CO4   Learners will think about sustainable development

Course (Paper) Name and No.: Industrial & Labour Economics -VI

CO1   Learners will get with the nature of industries in India.

CO2   Learners will know factors affecting location of industries and regional imbalance.

CO3   Learners will aware about factors affecting of industrial productivity and sickness.

CO4   Learners will get with history of developmental of industries in India.

Course (Paper) Name and No.: Economics of Agriculture and cooperation -VI

CO1   To get the role of agriculture in economic development.

CO2   To know the institutional and non-institutional sources of credit and micro finance.

CO3   To recognize the importance of marketing in agriculture.

CO4   To understand various agriculture price and policy

Course (Paper) Name and No.: Research Methodology - VII

CO1   Learners will study the concepts of research.

CO2   Learners will study the elements of research methodology.

CO3   Learners will study the different sources of data for research.

CO4   Learners will study the process and analysis of data

Course (Paper) Name and No.: Environmental Economics - VIII

CO1   Learners will study the environment and its importance in development.

CO2   Learners will study the various environmental policies for sustainable development.

CO3   Learners will study about environmental improvement.

CO4   Learners will study the environmental problems.

Course (Paper) Name and No.: History of Modern Maharashtra (1818 CE-1960)

CO1   Learners will acquaint a deeper and more inclusive understanding of landmarks events, personality.

CO2   To nature of pre-British education can be explained to the students.

CO3   The students can study the movements of the 19th century.

CO4   Political history of Maharashtra can be stressed.

Course (Paper) Name and No.: History of Contemporary India (1947CE-2000CE)

CO1   Students will acquire a deeper and more preclusive understanding of changes, Personality and themes in modern Indian history

CO2   To explain to the students importance of Foreign Policy for the Development for the Country.

CO3   To Explain to the learners how socio-economic development took place in the History course of Contemporary India.

CO4   Understanding the major trends of Modern India to the Learners.

B. English

Course (Paper) Name and No.: 16th to 18th Century English Literature IV_UAR5EG4

CO1   Explain salient literary movements duringElizabethan Era

CO2   Identify characteristics of Jacobean period anddevelopment of poetry and drama

CO3   Analyse characters, themes and dramatic devicesin the world-famous tragedy of Shakespeare

CO4   Perceive depiction of human values incorporated in different genres of English literature during 16th century

Course (Paper) Name and No.: Literary Criticism V _UAR5EG5

CO1   Define critical terms with suitable examplesbelonging to English literature

CO2   Explain the relationship between literature andliterary criticism

CO3   Appraise distinguished functions of literarycriticism

CO4   Develop the skill of identification of meter used inEnglis prosody

Course (Paper) Name and No.: Grammar and Art of Writing VI _UAR5EG6

CO1   Identify vowel, consonants and morpheme of theEnglish language

CO2   Classify word classes and different phrases ofEnglish language

CO3   Evaluate nature of mode, tenor and domain oflanguage

CO4   Develop the mechanics of print media

Course (Paper) Name and No.: 19th Century English Literature (VII)_UAR5EG7

CO1   Explain characteristics and growth of romanticismas literary movement

CO2   Identify features of Romanticism depicted inpoems

CO3   Examine the depiction of women characters inRomantic novel

CO4   Justify the relation between nature and manthrough literature

Course (Paper) Name and No.: 20th Century British Literature_UAR5EG8

CO1   Demonstrate the importance of literary texts andmovements and their different linkages

CO2   Identify the multiplicity of literary texts andrelevance to 20th century Britain

CO3   Interpret social, political and historical contexts of literary texts and interconnectivity with significantphilosophical trends of the world

CO4   Discuss the comprehensive and rebellious nature of 20th Century British Literature and its corelationwith shifting nature of British society

Course (Paper) Name and No.: Literature of Protest (IX)_UAR5EG9

CO1   Explain the distinctiveness and new modes of literary expressions which rejects traditional literary aesthetics

CO2   Inspect the   dehumanized practices,   power structures and divide in the Hindu social order

CO3   Criticize oppressive systems of caste and wretched condition of Dalit's lives and applaud the skills of Dalit writers

CO4   Develop protest against brutality and participate actively in the process of making healthy community

C. Geography

Course (Paper) Name and No.: Geography of Settlements_ (UAR5GE4)

CO 1   Understand the importance, nature and scope of Settlement Geography and types of settlements.

CO 2   Explain the origin, growth and classification of rural settlements.

CO 3   Explain and evaluate the distribution, density and variations in rural settlement patterns and morphology in India.

CO 4   Explain the origin, growth and classification of urban settlements and examine the models of urban settlement.

Course (Paper) Name and No.: Geography of Maharashtra_ (UAR5GE5)

CO 1   Understand the location, administrative setup and geographical personality of Maharashtra.

CO 2   Explain the drainage and climate in Maharashtra.

CO 3   Interpret the population growth, distribution and structure of population and analyze the population data.

CO 4   Explain the agriculture, fisheries and livestock resources in Maharashtra and to evaluate the recent issues and policies of them.

Course (Paper) Name and No.: Population Geography_ (UAR5GE5)

CO 1   Understand the nature, scope, importance of Population Geography and explain the relation with other social sciences.

CO 2   Explain and analyze the structure, growth, density and distribution of population in India and World.

CO 3   Explain and evaluate the population theories.

CO 4   Understand the causes, consequences of migration and to explain the trends of migration in India.

Course (Paper) Name and No.: Tools and Techniques in Geography for Spatial Analysis-I (Practical)_ (UAR5GE6)

CO 1   Demonstrate an understanding the basic concepts of projection and able to construct the projections.

CO 2   Explain the basic elements of map and able to delineate the water shade on toposheet and longitudinal profile of river.

CO 3   Explain the basics of topographical maps and interpret the different topographical maps.

CO 4   Prepare the thematic maps by conventional methods

Course (Paper) Name and No.: Regional Planning and Development_(UAR5GE7)

CO 1   Understand the concept, nature and problems associated with Regional Planning

CO 2   Explain the concept, types of region and demarcate the planning regions.

CO 3   Understand the concept and indicators of development and to explain the strategies and rregional disparities in development.

CO 4   Explain the planning and planning regions of India.

Course (Paper) Name and No.: Geography of Resources_(UAR5GE8)

CO 1   Understand the concept, factors, importance and classification of resources.

CO 2   Explain the resource consumption pattern and conservation measures of natural resources.

CO 3   Explain the distribution, consumption of water and forest resources and evaluate the problems and Conservation methods of water, forest resources.

CO 4   Explain the distribution, consumption of soil and mineral resources and evaluate problems the conservation methods of soil and mineral resources.

Course (Paper) Name and No.: Geography of Health_(UAR5GE8)

CO 1   Understand the nature, scope, approaches and evolution geography of Health Geography.

CO 2   Understand the Causes, and effects of air, water, radioactive and plastic pollution and suggest the solutions for them.

CO 3   Explain the weather related diseases and analyze the case studies of communicable and non-communicable diseases.

CO 4   Understand the linkages of health with environment and health related issues.

CO 5   Understand the distribution of hhealth care facilities and analyse the health care policies and health organisations in India.

Course (Paper) Name & No.: Geography of Disaster Mitigation & Management(UAR5GE8)

CO 1   Understand the concept, types and impacts of disaster.

CO 2   Explain the concept and role of national and international organisations for disaster management.

CO 3   Understand apply the methods of disaster management at pre and post disaster stage.

CO 4   Explain and apply the methods for the disaster management of earthquake, flood, cyclone and famine.

CO 5   Explain the causes, effects and management of industrial hazards, terrorism, wild fire and accidents.

Course (Paper) Name and No.: Geospatial Technology _ (UAR5GE9)

CO 1   Demonstrate an understanding the concept, components of Geospatial Technology.

CO 2   Explain the concepts of DEM and able to analyze and interpret the aerial photographs and satellite imageries.

CO 3   Explain the concepts and types of GPS and able to use the applications GPS as well as capable to survey through GPS.

CO 4   Use of image/map in GIS software's and Geo-referencing.

CO 5   Create the maps by using GIS software's.

D. Hindi

Course (Paper) Name and No.: Hindi Sahitya Ka Itihas, (Adhunik kal) Paper-IV_ UAR5HN4

CO1   हिंदी साहित्य के इतिहास के पाठ्यक्रम से छात्रों को इतिहास के लेखन परंपरा का विभिन्न कालखण्डों के नामकरण एवं समय सीमा का तथा युगीन परिस्थितियों का आकलन कर सकेगे।

CO2   वीरगाथाकालीन नाथ साहित्य की रचनाओं, कवियों, प्रवृत्तियों से प्रेम एवं वीर, साहसी भावनाओं की छात्रों में वृद्धि होगी।

CO3   रीतिकाल और भक्तिकालीन साहित्य के अध्ययन से छात्रों में नीति के दर्शन, कर्म करने की प्रेरणा, समाज में व्याप्त विषमताओं के विरुद्ध अपनी आवाज को समाज के सामने प्रस्तुत कर सकेंगे।

CO4   भक्तिकाल के साहित्य से जाति-पाति, धर्म की भेद-भावना नष्ट होगी, गुरु का महत्व उसकी विभिन्न शाखाओं, विशेषताओं का ज्ञान होगा, उसमें निहित आदर्श विचारोँ एवं नैतिक मूल्यों के प्रति प्रेम होगा एवं शुद्ध आचरण को स्पष्ट कर पायेंगे।

Course (Paper) Name and No.: Post-Independence Hindi Literature _UAR5HN5

CO1   Explain various social messages and values expressed in drama – Khajurao Ka Shilpi and Rashmirathi

नाटक खजुराहो का शिल्पी और रश्मिरथी में व्यक्त विभिन्न सामाजिक संदेशों और मूल्यों की व्याख्या करना |

CO2   Identify the human characteristics displayed by various characters in these drama and poetry

इन नाटक और कविताओं में विभिन्न पात्रों द्वारा प्रदर्शित मानवीय विशेषताओं को पहचानना|

CO3   Analyse and categorise the writing styles of post-independence writers and their thought process

स्वतंत्रता के बाद के लेखकों की लेखन शैली और उनकी विचार प्रक्रिया का विश्लेषण और वर्गीकरण करना|

CO4   Critically evaluate and explain the post-independence literature

स्वतंत्रता के बाद के साहित्य का समालोचनात्मक मूल्यांकन और व्याख्या करना|

Course (Paper) Name and No.: Information Technology in Hindi_UAR5HN6

CO1   इस पाठ्यक्रम के अध्ययन से छात्र सूचना प्रौद्योगिकी के विकास एवं चुनौतियां, समस्याएं, समाधान तथा हिन्दी में उसके उपयोग को समझ सकेंगे ।

CO2   सूचना प्रौद्योगिकी से भारतीय समाज जीवन में सकारात्मक, नकारात्मक प्रभाव, शिक्षा के क्षेत्र में योगदान, उसका ग्रामीण अर्थव्यवस्था पर प्रभाव, भारतीय समाज जीवन में परिवर्तन की आलोचना कर पायेंगे ।

CO3   कंप्यूटर पर हिन्दी में कामकाज, इंटरनेट पर हिंदी में विज्ञापन, मेल, ब्लॉग, ई-पत्रिकाएँ तथा रोजगार की विविध संभावनाओं के महत्व को जानेंगे ।

CO4   सायबर अपराध, सुरक्षा की चुनौतियाँ, सायबर शिक्षा का महत्व एवं संवैधानिक प्रावधानों से समझने की शक्ति प्राप्त होगी ।

Course (Paper) Name and No.: Literary Criticism: Prosody & Rhetoric's_UAR5HN7

CO1   काव्यशास्त्र के पाठ्यक्रम का अध्ययन करने से छात्रों को काव्य की प्रचलित संस्कृत, हिंदी, अंग्रेजी की परिभाषाओं से तीनों भाषाओं का ज्ञान होगा तथा काव्य के प्रयोजन, हेतु एवं तत्वों को समझेंगे जिसके कारण छात्रों में कल्पनाशिलता एवं भाषा शैली की क्षमता निर्माण हो सकेगी ।

CO2   विविध साहित्यिक छंदों के अध्ययन से विषयवस्तु एवं प्रसंगों के अनुसार छंदों में काव्य सृजन कला विकसित कर सकेंगे ।

CO3   छात्रों में साहित्य की विभिन्न पद्य विधाओं के अध्ययन से आलोचना करने, समीक्षा करने की कौशल निर्माण होंगे इसके कारण वे भविष्य में उत्कृष्ट आलोचक निर्माण होंगे ।

CO4   कला की परिभाषा, भेद, प्रयोजन तथा कला और साहित्य के अंतर्संबंध से परिचय हो सकेंगे ।

Course (Paper) Name and No.: Linguistics Hindi Language & Hindi Grammar_UAR5HN8

CO1   Describe various concepts of language and linguistics

        भाषा और भाषाविज्ञान की विभिन्न अवधारणाओं का वर्णन करना|

CO2   Apply the concepts of introductory Hindi grammar and linguistics

        परिचयात्मक हिंदी व्याकरण और भाषाविज्ञान की अवधारणाओं को लागू करना|

CO3   Classify the sound of alphabets from the pronunciation's aspect

        उच्चारण की दृष्टि से हिंदी वर्णों का वर्गीकरण करना |

CO4   Discuss the reasons behind changing pattern seen in language over period of time

        समय के साथ देखे जाने वाले भाषा में परिवर्तन के कारणों पर चर्चा करना |

Course (Paper) Name and No.: Mass Media_UAR5HN9

CO1   Explain the origin and evolution of traditional and Modern Mass Media

पारंपरिक और आधुनिक जनसंचार माध्यमों की उत्पत्ति और विकास की व्याख्या करना|

CO2   Describe various operational aspects of Mass Media

मास मीडिया के विभिन्न परिचालन पहलुओं का वर्णन करना|

CO3   Utilise knowledge of Hindi in creative writing such as scripts, interviews, news writing etc.

रचनात्मक लेखन जैसे स्क्रिप्ट, साक्षात्कार, समाचार लेखन आदि में हिंदी के ज्ञान का उपयोग करना ।

CO4   Distinguish various traditional and modern platforms of mass media and their relevance, features and applications along with impact

विभिन्न पारंपरिक और आधुनिक जनसंचार माध्यमों की प्रासंगिकता, विशेषताओं और अनुप्रयोगों के साथ-साथ प्रभाव में अंतर करना|

E.   History

Course (Paper) Name and No.: History of Medieval India(1000 CE-1526CE)_UAR5HS4

CO1   The students will learn the Sultanate rule and the history of Vinjaynagar and Bahamani Kingdom.

CO2   Students can study the socio-economic, cultural and political contribution of Medieval India

CO3   Students will get knowledge about the art and architecture of Medieval India.

CO4   In the curriculum of the Medieval India, students get guidance from within the workings of the rulers.

Course (Paper) Name and No.: History of Modern Maharashtra(1818 CE-1960)_UAR5HS5

CO1   Learners will acquaint a deeper and more inclusive understanding of landmarks events, personality.

CO2   To nature of pre-British education can be explained to the students.

CO3   The students can study the movements of the 19th century.

CO4   Political history of Maharashtra can be stresed.

Course (Paper) Name and No.: Introduction to Archaeology_UAR5HS6

CO1   The learners will acknowledge about Archaeology and its importance in History.

CO2   They will get knowledge about Epigraphy and its correlation with History.

CO3   They will understand importance of Numismatic in reorganisation of history.

CO4   They will know opportunities in field of Archaeology.

Course (Paper) Name and No.: History of the Marathas (1630 CE-1707CE) _UAR5HS7

CO1   Understand how the administrative system of Royal Period is useful in present time.

CO2   They will know the process of consolidation of Maratha Samrajya and successor of Shivaji Maharaj.

CO3   Students will learn significance of regional history.

CO4   It will enhance their perception of 17th century India in context of Maratha history

Course (Paper) Name and No.: History of Contemporary World_UAR5HS8

CO1   The students will comprehend the important events took place after Second World War period in the world and it's influenced in the present world politics.

CO2   Students will gained knowledge of world events.

CO3   Students will acknowledged about the various movements world History.

CO4   Students will understood the major trends in 20th century.

Course (Paper) Name and No.: Research Methodology and Sources of History_UAR5HS9

CO1   Students will be able to learn methods in research writing and understand the new trends in historical research.

CO2   The students developed a research approach.

CO3   Historical Research can help students understand the Authenticity and Creadibality.

CO4   Students can study the Sources of History through Indian Historiography.

SEMESTER VI

A. Economics

Course (Paper) Name and No.: Macro Economics - IV

CO1   To study the goods market and the open economy.

CO2   To study the financial market.

CO3   To study the exchange rate crisis.

CO4   To study the international monetary situation

Course (Paper) Name and No.: International Economics - V

CO1   Learners are studied the importance of international economics.

CO2   Learners are studied the various modern theories of international trade.

CO3   Learners are learned how trade is an engine of economic growth.

CO4   Learners understand the trade policy and regionalism

Course (Paper) Name and No.: Industrial &Labour Economics - VI

CO1   Learners will study the nature of labour market.

CO2   Learners will get with past, present and future of trade unions.

CO3   Learners will be aware about industrial relations and its measures.

CO4   Learners will get ways of labour welfare and social security

Course (Paper) Name and No.: Economics of Agriculture and cooperation -VI

CO1   To understand the important feature of co-operation.

CO2   To get need, structure and progress of co-operative finance.

CO3   To know the role and types of co-operative agro Industries.

CO4   To know the role of co-operative organization in India

Course (Paper) Name and No.: Research Methodology - VII

CO1   Learners will study statistical applications in research.

CO2   Learners will study index numbers.

CO3   Learners will study hypothesis formulation and testing.

CO4   Learners will study research report writing

Course (Paper) Name and No.: Development Theory and Experience -VIII

CO1   Learners will study the relation between demography and development.

CO2   Learners will get information structural transformation.

CO3   Learners will get knowledge about land, labour and credit market.

CO4   Learners will know the importance of environment and development.

Course (Paper) Name and No.: International trade policy and practice -IX

CO1   Learners will understand the difference between interregional and international trade.

CO2   Learners will understand the GATT, WTO and Doha round.

CO3   Learners will understand the international financial institutions and debt problem.

CO4   Learners will study the foreign capital flow in economy

B. English

Course (Paper) Name and No.: Literary Criticism_UAR6EG5

CO1   Explain literary movements with suitableillustrations through literary text

CO2   Experiment   with   New   criticism as a criticalapproach

CO3   Analyse nature, features and growth of feminismand its application to literature

CO4   Develop the technique of appreciation of a poemon the basis of practical criticisr

Course (Paper) Name and No.: Grammar and Art of Writing_UAR6EG6

CO1   Identify structures of English language

CO2   Use the correct grammatical structures of English language

CO3   Analyse various rhetorical devices in English language

CO4   Design advertisement through effective use of language

Course (Paper) Name and No.: 19th Century English Literature _UAR6EG7

CO1   Recognize impact of industrial revolution onVictorian Literature

CO2   Identify themes and poetic devices employed inVictorian poetry

CO3   Examine social concerns represented in Victorianfiction

CO4   Asses morality present through Victorian literaryworks and its application

Course (Paper) Name and No.: 20th Century British Literature_UAR6EG8

CO1   Explain the contribution of well-known precursorsand literary genres of Britain after the catastrophicconditions of war

CO2   Identify the distinctiveness and unconventional literary enterprise and passionate grief about loss of spiritualism and human values

CO3   Criticize the significant subject matters, evils ofwars and decline of value systems

CO4   Discuss the anti-traditional, innovative and experimental literary contribution and praise the unique literary talent

Course (Paper) Name and No.: 16th to 18th Century English Literature_UAR6EG9

CO1   Illustrate features of Restoration epoch andgrowth of drama

CO2   Distinguish between one's honour versus love represented in historical drama

CO3   Interpret prominent genres of poetry in Englishdeveloped during 18th century

CO4   Solve conflicts experienced by the protagonist andits application in real life

C. Geography

Course (Paper) Name and No.: Environmental Geography_ (UAR6GE4)

CO 1   Understand the nature, scope, importance and man-environment relationship in Environmental Geography.

CO 2   Explain the Structure, functions and types of ecosystem.

CO 3   Understand the concept, types, distribution and hotspots of biodiversity. Evaluate the threats and conservation methods of biodiversity

CO 4   Evaluate the environmental problems with their causes, effect and solutions.

CO 5   Understand the concept of Environmental management and Sustainable Development and motivate the student to apply the ecofriendly life style.

Course (Paper) Name and No.: Geography of Tourism and Recreation

CO1   Understand about nature, scope, development and factors of tourism development

CO2   Understand about infrastructure and ancillary services for tourism

CO3   They understand about types and impacts of tourism.

CO4   Understand Planning and organization about tourism

CO5   Understand the potential of tourism sectors in Maharashtra and India

CO6   Know about national tourism policy.

Course (Paper) Name and No.: Geography of Tourism and Recreation_ (UAR6GE5)

CO 1   Understand about nature, scope and components of tourism

CO 2   Analyze the new trends in tourism and impact of tourism.

CO 3   Explain the role of infrastructure and technology in tourism development.

CO 4   Explain planning of tourism and role of tourism organizations.

CO 5   Explain the potential of tourism in Maharashtra and evaluate the tourism policy of Maharashtra.

Course (Paper) Name and No.: Tools and Techniques in Geography for Spatial Analysis-II (Practical)

CO1   Understand the Meaning and types of data and its presentation.

CO2   Understand and able to solve the examples of measures of central tendency, dispersion and deviation and correlation, regression and hypothesis testing.

CO3   Able to collect and analysis of data sampling.

CO4   Able to collect the field data, its processing and writing of research report.

Course (Paper) Name and No.: Political Geography_ (UAR6GE5)

CO 1   Understand the nature, scope, historical development and recent trends in Political Geography. Explain the concepts of state, nation and nationalism.

CO 2   Explain the approaches and concepts in Political Geography.

CO 3   Explain the concept, distinction and functions and classification of frontiers and boundaries. Evaluate the disputes related with India's boundaries.

CO 4   Explain the Geostatic and Geopolitical views.

CO 5   Explain the concept, nature and approaches of Electoral Geography.

Course (Paper) Name and No.: Tools and Techniques in Geography for Spatial Analysis-II (Practical)_ (UAR6GE6)

CO 1   Demonstrate an understanding the types of data and able to draw the graphs.

CO 2   Solve the examples of measures of central tendency, dispersion and deviation.

CO 3   Solve the examples of correlation, regression and hypothesis testing.

CO 4   Calculate the point, line and area sampling.

CO 5   Collect the data and prepare the research report.

Course (Paper) Name and No.: Economic Geography _(UAR6GE7)

CO 1   Explain the nature, scope branches and approaches of Economic Geography.

CO 2   Explain and classify human economic activities.

CO 3   Explain the mineral resources and industrial development and evaluate the Weber's industrial location theory.

CO 4   Explain the importance and pattern of transport, international trade and trade organizations.

CO 5   Explain the levels of economic development and evaluate the impact of globalization, Special Economic Zones and related issues in India.

Course (Paper) Name and No.: Biogeography_(UAR6GE8)

CO 1   Explain the nature, scope, branches and approaches of Biogeography.

CO 2   Explain the Structure, components, functions and types of ecosystem and biosphere.

CO 3   Classify the plant community, biotic succession and major plant formation and biomes.

CO 4   Explain the marine biogeography, ocean habitats and island biogeography

CO 5   Explain the types, importance, loss and conservation of biodiversity.

Course (Paper) Name and No.: Social Geography_ (UAR6GE8)

CO 1   Explain the nature, scope, branches of Social Geography and concept of socio-cultural regions.

CO 2   Explain the race, religion, language and tribes in the world and distinguish between them.

CO 3   Explain the race, religion, language and tribes in India and distinguish between them.

CO 4   Evaluate the contemporary social issues in India.

CO 5   Analyse and evaluate the social welfare policies of government of India.

Course (Paper) Name and No.: Geography of Transport_ (UAR6GE8)

CO 1   Explain the concept, nature, scope and significance of Transport Geography.

CO 2   Explain and analyze the transport network system, efficiency of network and conflicting aspects of decision making.

CO 3   Explain the evolution of transport network, phases of growth and development of transport modes and analyse the comparative cost structures.

CO 4   Explain the concept of connectivity and accessibility and theories of transport.

CO 5   Evaluate the issues of transport development in India.

D. Hindi

Course (Course: Modern History of Hindi Literature   _UAR6HN4

CO1   आधुनिककाल की विभिन्न रचनाओं एवं रचनाकारों के अध्ययन से छात्रों में साहित्य लेखन की क्षमता निर्माण होगी तथा वे अपने युग के अनुकूल एवं प्रसंग के अनुसार लेखन कार्य कर सकेंगे।

CO2   उस काल की सामाजिक-सांस्कृतिक और राजनीतिक स्थिति के संदर्भ में आधुनिक काल की विशेषताओं का तुलनात्मक विश्लेषण कर पायेंगे।

CO3   हिन्दी साहित्य के अध्ययन से छात्र आधुनिक काल के उद्भव के कारणों को स्पष्ट करने में सक्षम होंगे

CO4   हिन्दी साहित्य के प्रत्येक काव्य विधा एवं गद्य विधा के कालखंड को दिए गए नामों के महत्व और आधार को प्रस्तुत करने में सक्षम होंगे।

Course (Paper) Name and No.: Post Independence Hindi Literature_UAR6HN5

CO1   Explain the linkage between Mahabharata era and current scenario

महाभारत काल और वर्तमान परिदृश्य के बीच संबंध की व्याख्या करना|

CO2   Explain the life journey of revolutionary freedom figher Birsa Munda and his stand against the British rule in India.

क्रांतिकारी स्वतंत्रता सेनानी बिरसा मुंडा की जीवन यात्रा और भारत में ब्रिटिश शासन के खिलाफ उनके रुख की व्याख्या करना|

CO3   Analyse and categorise the writing styles of post-independence writers Dharamveer Bharti and Iqbal Durrani

स्वतंत्रता के बाद के लेखकों धर्मवीर भारती और इकबाल दुर्रानी की लेखन शैली का विश्लेषण और वर्गीकरण करना|

CO4   Critically evaluate the novel Gandhi Se Pehle Gandhi and poetry drama Andha Yug

उपन्यास गांधी से पहले गांधी और काव्य नाटक अंधा युग का आलोचनात्मक मूल्यांकन करना|

Course (Paper) Name and No.: Social Media __UAR6HN6

CO1   सोशल मीडिया के अध्ययन से पाठकों को इसके विकास, गुण, दोष एवं इसके विविध भेदों को समझ पायेंगे ।

CO2   इस पाठ्यक्रम के अध्ययन से छात्र सोशल मीडिया से प्रभावित भारत के विविध क्षेत्रों, इसकी प्रचलित भाषा, समाज एवं संस्कृति के अंतर्गत संबंधों तथा मुक्त अभिव्यक्ति के प्रति संवेदनशीलता विकसित होगी ।

CO3   सोशल मीडिया के अध्ययन से छात्र सोशल मीडिया और कानून, बदलता हुआ भारतीय परिवेश, इसकी उपलब्धियां, उपयोगिता एवं यूनिकोड के माध्यम से हिंदी भाषा लिपि की वैश्विकता से परिचय प्राप्त कर सकेंगे ।

CO4   सोशल मीडिया के अध्ययन से छात्र इसमें हिंदी के प्रसार, प्रयोग, इसकी समस्याएँ, चुनौतियाँ, सीमाएँ तथा इसकी भारतीय समाज एवं संस्कृति को स्पष्ट कर सकेंगे ।

Course (Paper) Name and No.: Literary Criticism : Prosody & Rhetoric's_UAR6HN7

CO1   इस पाठ्यक्रम के अध्ययन से छात्रों को शब्दशक्ति का अर्थ, स्वरूप, परिभाषा एवं उसके विभिन्न भेदों का परिचय प्राप्त होगा ।

CO2   छात्रों को रस के अर्थ, स्वरूप, उसके विविध अंग एवं भेदों से परिचय प्राप्त कराकर साहित्यिक रसास्वादन की क्षमता में वृद्धि होगी ।

CO3   छात्रों में उपन्यास, कहानी, निबन्ध, नाटक, आत्मकथा, रेखाचित्र संस्मरण तथा जीवनी इन साहित्यिक गद्य विधाओं के अध्ययन से उनमें निहित विषयों से परिचित होंगे तथा उनमें लेखन, अभिनय एवं समीक्षा की क्षमता निर्माण कर सकेंगे ।

CO4   विभिन्न अलंकारों की परिभाषाओं एवं सोदाहरण विवेचनों से जहां एक ओर इनका ज्ञान वृद्धिगत होगा वहीं दूसरी ओर उनमें अलंकारिक भाषा शैली की क्षमता भी विकसित होगी, जिसके आधार पर छात्र भविष्य में अलंकारिक भाषा शैली में काव्य रचनाओं का सृजन भी कर सकेंगे ।

Course (Paper) Name and No.: Linguistics Hindi Language & Hindi Grammar_UAR6HN8

CO1   Explain the origin and evolution of Hindi Language

हिंदी भाषा की उत्पत्ति और विकास की व्याख्या करना|

CO2   Classify different forms of Hindi Language.

हिन्दी भाषा के विभिन्न रूपों का वर्गीकरण करना|

CO3   Apply different forms of Hindi language and correct grammar.

हिंदी भाषा के विभिन्न रूपों और व्याकरण को लागू करना |

CO4   Identify charactoristics and distinguish various ancient and medieval period languages
i.e Sanskrit ,Pali, Prakrut, Apbhransh

विभिन्न प्राचीन और मध्ययुगीन काल की भाषाओं जैसे संस्कृत पाली, प्राकृत, अपभ्रंश की विशेषताओं

को अलग कर पहचानना|

Course (Paper) Name and No.: Mass Media_UAR6HN9

CO1   Explain the use of language in various areas of Mass Media like Newspapers, Radio, Television and Cinema.

समाचार पत्र, रेडियो, टेलीविजन और सिनेमा जैसे मास मीडिया के विभिन्न क्षेत्रों में भाषा के उपयोग

की व्याख्या करना |

CO2   Identify various types of Advertisement platforms

विभिन्न प्रकार के विज्ञापन प्लेटफॉर्म की पहचान करना|

CO3   Explain various applicable SOPs/Guidelines governing the Advertisement vertical conduct

विज्ञापन आचरण को नियंत्रित करने वाले विभिन्न लागू दिशानिर्देशों की व्याख्या करना|

CO4   Discuss various aspects of documentary and short film making

वृत्तचित्र और लघु फिल्म निर्माण के विभिन्न पहलुओं पर चर्चा करना|

E.   History

Course (Paper) Name and No.: History of Medieval India (1526CE-1707CE)_UAR6HS4

CO1   The students will get knowledge about the political power of Mughal and Maratha.

CO2   They will get knowledge about Administrative systems of Mughals.

CO3   Learner will understood the origin and growth of regional empire.

CO4 To study the impact on Medieval Indian Society and Polity.

Course (Paper) Name and No.: History of Contemporary India (1947CE-2000CE)_UAR6HS5

CO1 Students will acquire a deeper and more preclusive understanding of changes, Personality and themes in modern Indian history

CO2 To explain to the students importance of Foreign Policy for the Development for the Country.

CO3 To Explain to the learners how socio-economic development took place in the History course of Contemporary India.

CO4 Understanding the major trends of Modern India to the Learners.

Course (Paper) Name and No.: Introduction of Museology and Archival Science_UAR6HS6

CO1 The students will get encourage to pursue careers in the field of Museology.

CO2 They will Know Archaeology as well as understand the glorious cultural development and scope and value.

CO3 To understood the historical value of Archival Science.

CO4 They will acknowledged about the new trends of Digitization of Records.

Course (Paper) Name and No.: History of the Maratha - Peshwa Period(1707CE- 1818CE)_ (UAR6HS7)

CO1 Students will be able to analyse the Marathas polices of expansion and its consequences.

CO2 They will understand the role played by the Marathas in the 18th century India.

CO3 To follow the various personalities of the Peshwa Period.

CO4 Students can study the features of administration of Peshwa Period.

Course (Paper) Name and No.: History of Asia (1945 CE- 2000CE)_UAR6HS8

CO1 The students will get knowledge of transformation of China under Mao Zedong and Deng Xiaoping.

CO2 They will understand the reconstruction the of Japan and major trends that emerge in Asia.

CO3   Learners will comprehend about the political condition of Southeast Asia.

CO4   To Understood the conflicts in Southeast Asia.

Course (Paper) Name and No.: Research Methodology and Sources of History_UAR6HS9

CO1   Students will be understanding and aware of historical research.

CO2   The understand to students the importance of Local History in new trend of Historical Research.

CO3   Introduce students to various approaches in Historical research.

CO4   To Understand the elements of Historical Research through research.

Master of Arts

Semester I

A. Economics

Course (Paper) Name and No.: Micro Economics-I

CO1   Relate the utility with consumer behaviour.

CO2   Explain production, cost and supply function.

CO3   Make use of price and output determination under perfect competition.

CO4   Examine the monopoly and its aspects.

Course (Paper) Name and No.: Economics of Development

CO1   Demonstrate the role of social and economic indices of growth and development.

CO2   Judge various modern theories of growth and distribution.

CO3   Define various market concepts.

CO4   Examine the various aspects of Foreign trade.

Course (Paper) Name and No.: - Macro Economics

CO1   Relate economic mechanism with their regular life.

CO2   Illustrate the concept of national income.

CO3   Identify the mechanism of the open economy.

CO4   Assess the functions of the money and capital market.

Course (Paper) Name and No.: Statistical Methods in Economics

CO1   Define concept of Random variable and its types.

CO2   Explain concept of Hypothesis and different type's distributions and its applications.

CO3   Concept of simple linear regression and interpretation of regression coefficient.

CO4   List the problems in simple linear regression and its consequences.

B. English Literature

Course (Paper) Name and No.: Literary Theory and Criticism- I

CO1   Interpret classical critical theories and itsreflection in literature

CO2   Apply Romantic critical theories and its relevancein literary texts

CO3   Examine nature and features of Indian classicaldrama

CO4   Develop techniques of New Criticism for betterappreciation of literature

Course (Paper) Name and No.: Linguistic and Stylistic Analysis of Text- II

CO1   Classify figurative devices and linguistic patterns demonstrated in language

CO2   Make use of lexis and syntax of language

CO3   Analyse the usage of cohesion and coherence in English language

CO4   Elaborate stylistic and linguistic approach to the study of literature

Course (Paper) Name and No.: Fiction- III

CO1   Interpret significant types of novels with suitable examples

CO2   Identify satirical elements reflected in the novel and its corelation with socio-political condition

CO3   Analyse distinctiveness of Victorian novelist and their depiction of multiple themes

CO4   Perceive the causes of tragedy in literature as well as in real life

Course (Paper) Name and No.: Drama- IV

CO1   Demonstrate origin and development of drama and its theatrical features

CO2   Identify tenets of Natyashastra and its reflection in Sanskrit drama

CO3   Examine the need for emancipation of women and revolt against patriarchy

CO4   Assess the reflection of human values in the drama and its application

C. Hindi

Course (Paper) Name and No.: History of Hindi Literature(Adhunik kal), Paper-I

CO1   Understanding the basis of the classification of Hindi literature.

CO2   Understanding the concept of history of literature.

CO3   Understanding the features of Adikal, Bhakti kal, Ritikal and Adhunikkal, in context of socio - cultural and political condition of that period.

CO4   Understanding the literary trends of Adhunik kal

CO5   Understanding the reason of emergence of Adhunikkal in Hindi literature

Course (Paper) Name and No.:kavyasastra evam Sahityalochan, Paper-III

CO1   Understanding the criticisms of Indian poetry theory and their basis information.

CO2   Understanding the theory of national poetry.

CO3   Understanding the theory of international poetry.

CO4   Understanding the Indian theory of thinkers.

CO5   Understanding the Indian theory and criticisms of International thinkers.

Course (Paper) Name and No.: Bhasha Vigyan avam Hindi Bhasha, Paper-5

CO1   Learners will be able to understand and list down various aspects of Linguistics and Hindi language

CO2   To be able to understand nuances of Phonetics, Morphology, Syntax and semantics

CO3   To be able to trace and list down the entire journey of Hindi language period wise with unique aspects of all stages.

CO4   To be able to comprehend all aspects of Devanagrilipi including origin, evolution and unique features.

CO5   To be able to apply the knowledge of advanced level of grammar

Course (Paper) Name and No.: Ancient and Medieval Poetry, Paper-7

CO1   Describing the progressive nature of Sant Kabir and his writings.

CO2   Understanding the vision of Mira in context of her Krishna Bhakti poetry.

CO3   Describing the Krishna leela poetry of Soordas by relating it with his philosophy of his life

CO4   Understanding the vision of Malik Mohd Jaysi in context of poetry.

CO5   Describing the Rama Bhakti poetry of Tulsidas along with the philosophy of Bhakti cult.

CO6   Understanding bravery in context of Bhushan poetry.

Semester II

A. Economics

Course (Paper) Name and No.: Micro Economics

CO1   Outline the game theory in detail.

CO2   Create an understanding of strategic behaviour under oligopoly and monopoly market.

CO3   Simplify the information economics for their practical life.

CO4   Define various alternative theories of the firms.

Course (Paper) Name and No.: Macroeconomics-II

CO1   Examine the price setting mechanism in an economy.

CO2   Relate the importance of Neo-Classical economics.

CO3   Elaborate the Keynesian economics in detail.

CO4   Summarise Macroeconomic policies.

Course (Paper) Name and No.: Public Economics

CO1   Define mechanism of taxation in India.

CO2   Illustrate local, state and central government expenditure.

CO3   Evaluate tax regulation, distribution, implication and tax evasion.

CO4   Examine India's federal structure, Decentralization and Government reforms.

Course (Paper) Name and No.: Mathematical Techniques for Economics

CO1   Make use of concept of Set and different types of functions.

CO2   Examine concept of derivative and unconstrained optimization and its application in economics.

CO3   Interpret constrained optimization with equality and inequality constraints.

CO4   Adapt concept of matrices and its applications.

B. English Literature

Course (Paper) Name and No.: Literary Theory and Criticism- I

CO1   Recognise the relationship between literature and literary theories

CO2   Identify   feministic   ideology   represented   in literature

CO3   Distinguish features of Reader Response Theory and its application to literary works

CO4   Evaluate the formation of ecocriticism and its essence in literature as well as in real life

Course (Paper) Name and No.: Linguistic and Stylistic Analysis of Text- II

CO1   Illustrate the sound system of English language

CO2   Identify place and manner of articulation of Vowels and Consonants

CO3   Inspectsalient traits   in   narratology   and   its application

CO4   Explain the techniques of discourse analysis

Course (Paper) Name and No.: Fiction- III

CO1   Illustrate modern and postmodern novels, its unique characterization and shifting from traditional themes

CO2   Identify the significant contribution of modern novelists and their focus on elements of psychology and imperialism

CO3   Distinguish the conflict between good and evil in literary text and life

CO4   Adapt social, ethical values percolated in the literary texts

Course (Paper) Name and No.: Drama IV

CO1   Classify   different   types   of   drama and   its   distinctiveness   in modern and postmodern era

CO2   Identify the relationship between nature and manpresent in literature and society

CO3   Compare antitraditional features of absurd dramaand its thematic concerns

CO4   Estimate various paradigms of relationship andproblems of working class depicted in the plays

C. Hindi

Course (Paper) Name and No.: History of Hindi Literature(Adhunik kal), Paper II

CO1   Understanding the basis of the classification of Hindi literature.

CO2   Understanding the concept of history of literature.

CO3   Understanding the features of Adikal, Bhakti kal, Ritikal and Adhunikkal, in context of socio - cultural and political condition of that period.

CO4   Understanding the literary trends of Adhunik kal

CO5   Understanding the reason of emergence of Adhunikkal in Hindi literature

Course (Paper) Name and No.:kavyasastra evam Sahityalochan, Paper IV

CO1   Understanding the criticisms of Indian poetry theory and their basis information.

CO2   Understanding the theory of national poetry.

CO3   Understanding the theory of international poetry.

CO4   Understanding the Indian theory of thinkers.

CO5   Understanding the Indian theory and criticisms of International thinkers.

Course (Paper) Name and No.: Bhasha Vigyan avam Hindi Bhasha, Paper- VI

CO1   Learners will be able to understand and list down various aspects of Linguistics and Hindi language

CO2   To be able to understand nuances of Phonetics, Morphology, Syntax and semantics

CO3   To be able to trace and list down the entire journey of Hindi language period wise with unique aspects of all stages.

CO4   To be able to comprehend all aspects of Devanagrilipi including origin, evolution and unique features.

CO5   To be able to apply the knowledge of advanced level of grammar

Course (Paper) Name and No.: Ancient and Medieval Poetry, Paper VIII

CO1   Describing the progressive nature of Sant Kabir and his writings.

CO2   Understanding the vision of Mira in context of her Krishna Bhakti poetry.

CO3   Describing the Krishna leela poetry of Soordas by relating it with his philosophy of his life

CO4   Understanding the vision of Malik Mohd Jaysi in context of poetry.

CO5   Describing the Rama Bhakti poetry of Tulsidas along with the philosophy of Bhakti cult.

CO6   Understanding bravery in context of Bhushan poetry.

Semester III

A. Economics

Course (Paper) Name and No.: Economics of Agricultural production and Rural Markets

CO1   Outline Economics of agricultural production and productivity in India.

CO2   Elaborate the Rural credit markets in India.

CO3   Define labour markets for economic development in India.

CO4   Identify Land and Lease market in detail.

Course (Paper) Name and No.: Economics of Labour Markets

CO1   Assess the nature of labour market.

CO2   Explain the demand and supply of labours.

CO3   Classify the various dimensions of wages in labour market.

CO4   Identify social upliftment of labours in India.

Course (Paper) Name and No.: Trade Unions and Industrial relations in India

CO1   Outline origin and roles of Trade Unions.

CO2   Discuss various approaches for the development of Industrial sector.

CO3   Evaluate responsibilities by workers in India.

CO4   Analyse the various laws related to industries and social development.

Course (Paper) Name and No.: Environmental Economics-IV

CO1   Outline role of environment in economic growth.

CO2   Explain different aspects related to environmental development.

CO3   Identify the issues related to environmental field.

CO4   Elaborate various environmental policies, agreements and case studies.

B. English Literature

Course (Paper) Name and No.: Poetry From Chaucer to Present_ PAR3PCP

CO1   Classify tenets of different schools of poetry inEnglish Literature

CO2   Identify attributes of Metaphysical school ofpoetry with illustrations

CO3   Examine the nature and features of Romantic andModern school of poetry

CO4   Measure the depiction of human values in poetryand its application in real life

Course (Paper) Name and No.: Gender Perspectives on Literature_PAR3GPL

CO1 Summarize prominent critical theories related togender with appropriate literary texts

CO2 Compare projection of men and women characters in the context of gender discrimination

CO3 Determine the status of women in patriarchal andsocietal system

CO4 Modify traditional prejudices and practice genderparity in the society

Course (Paper) Name and No.: Twentieth Century American Literature_PAR3TCA

CO1 Illustrate literary terms with suitable examples in the realm of twentieth century American Literature

CO2 Analyse identity crisis and philosophical veinsincorporated in American poetry

CO3 Perceive predicaments of the protagonist belonging to African American Literature

CO4 Develop the sense of multi- culturalism throughprominent texts of American Literature

Course (Paper) Name and No.: Shakespeare IV _ PAR3SHK

CO1 Interpret salient characteristics of Shakespearean tragedies with relevant illustrations

CO2 Identify nature and features of Romantic comediesas well as Historical plays of Bard of Avon

CO3 Evaluate prominent themes reflected in world famous works of William Shakespeare

CO4 Elaborate depiction of universal truths andrelevance of William Shakespeare in 21st Century

C. Hindi

Course (Paper) Name and No.: Modern Prose _ PAR3HN9

CO1 भारतीय कृषक के विसंगतिपूर्ण जीवन की अभिव्यंजना, सामाजिक शोषकों का यथार्थ चित्रण, समाजवादी व्यवस्था पर बल क्रांतिधर्मी नारी-चरित्रों की सृष्टि, आदर्श समाज की स्थापना का छात्र समीक्षात्मक अध्ययन कर सकेंगे ।

CO2 'आधे-अधूरे' नाटक के अध्ययन से छात्र मध्यवर्गीय परिवार की विसंगतियों, स्त्री-पुरुष के संबंधों, अमानवीय परिस्थितियों और पारस्परिक मनान्तर को समझेंगे ।

CO3 आधुनिक मध्यवर्गीय परिवार की सामाजिक, मानसिक और आर्थिक स्थितियों की समीक्षा कर सकेंगे।

CO4 आशोक के फुल निबन्ध संग्रह के अध्ययन से छात्रों में भारतीय इतिहास, इतिहास और संस्कृति तथा ऐतिहासिक खोजों का आलोचनात्मक अध्ययन करने की दृष्टि प्राप्त कर सकेंगे ।

Course (Paper) Name and No.: Modern Poetry _ PAR3HN11

CO1 जयशंकर प्रसाद के व्यक्तित्व एवं कृतित्व तथा कामायनी में चित्रित समरसता दर्शन को स्पष्ट कर सकेंगे

CO2 महाकाव्यत्व की कसौटी पर कामायनी का मूल्यांकन प्रस्तुत कर सकेंगे ।

CO3 राम की शक्ति पूजा तथा निराला की सभी कविताएँ एक साथ पुराण, इतिहास, धर्म, संस्कृति, मिथक, स्वप्न, यथार्थ, परंपरा तथा आधुनिकता को किस तरह अपने में समेटे हुए हैं इसको भिन्न-भिन्न सन्दर्भों में विश्लेषित कर सकेंगे ।

CO4 कविता के माध्यम से छात्र भ्रष्टाचार और अनैतिकता तथा स्वतन्त्रता पूर्व तथा स्वतन्त्रता के बाद की स्थितियों का तुलनात्मक अध्ययन कर सकेंगे ।

Course (Paper) Name and No.: Special Study : Hindi Poetry of Marathi Saint _ PAR3HN13

CO1 मराठी संतों के हिंदी काव्य तथा मराठी संतों से छात्र परिचय प्राप्त कर सकेंगे ।

CO2 मराठी संतों के काव्य के अध्ययन से छात्र महाराष्ट्र की संस्कृति तथा हिंदी भाषी क्षेत्रों की संस्कृति का तुलना कर सकेंगे ।

CO3 संत तुकाराम, संत नामदेव के काव्य के अध्ययन से छात्र मानवतावादी संदेश से परिचित हो सकेंगे ।

CO4 छात्र महाराष्ट्र के संतों के व्यक्तित्व एवं कृतित्व के अध्ययन से हिंदी भाषी संतों के विचारों की समीक्षा कर सकेंगे ।

Course (Paper) Name and No.: Prayojanmoolak Hindi _ PAR3HN15

CO1 Explain the context, characteristics and applications of Functional Hindi.

कार्यात्मक हिंदी के संदर्भ, विशेषताओं और अनुप्रयोगों की व्याख्या करना।

CO2 Make use of various forms of Functional Hindi like Creative language, Official Language, etc.

कार्यात्मक हिंदी के विभिन्न रूपों जैसे रचनात्मक भाषा, राजभाषा आदि का उपयोग करना।

CO3 Examine the many forms and process of translation to learn about the attributes that a translator must possess.

अनुवादक के गुणों के आधार पर उसके रूपों और प्रक्रियाओं का परीक्षण करना |

CO4 Explain the importance of advertisements in today's world with respect to its meaning, objective and types

वर्त्तमान युग में विज्ञापन के अर्थ, उद्देश्य और प्रकारों के संदर्भ में उनके महत्व की व्याख्या करना|

Semester IV

A. Economics

Course (Paper) Name and No.: Economics of Human Development

CO1   Illustrate various concepts related to human development.

CO2   Define multiple dimensions of human development.

CO3   Measure various aspects related to human development indices.

CO4   Identify different aspects of human development.

Course (Paper) Name and No.: Industrial Economics

CO1   Define market structure with the reference to the firms.

CO2   Explain overall development of industrial development with the help of technical know-how.

CO3   Examine the financial tools in industrial development.

CO4   Elaborate performance and growth of Indian Industrial sector.

Course (Paper) Name and No.: Agricultural Development and policy

CO1   Explain various theories of agricultural development.

CO2   Analyse various initiatives by public sector time to time for agricultural development.

CO3   Create awareness on contemporary debates in the area of agricultural products and market.

CO4   Explain trends about agricultural development and its implications.

Course (Paper) Name and No.: Research Project

CO1   Explain the basics of Research Methodology.

CO2   Compare the methods of data collection, analysis of data and presentation.

CO3   Decide the advance methods of analysis and Index

CO4   Compile the testing of hypothesis and report writing

B. English Literature

Course (Paper) Name and No.: Indian Writing in Translation I_ PAR4IWT

CO1   Interpret significant Indian texts in translation andits linkages between society and political upheavals

CO2   Identify reflection of Indian ethos and poetry

CO3   Distinguish the outstanding contribution of modern Indian dramatists and their unique representation of social realism

CO4   Elaborate the literary journey of Dalit women writers and their ways of empowerment and emancipation

Course (Paper) Name and No.: Research Methodology II_ PAR4RSM

CO1   Interpret essential key concepts for initiatingresearch in English language and Literature

CO2   Identify paradigms of primary, secondary data andplagiarism

CO3   Determine appropriate methods to be used forresearch in English language and Literature

CO4   Develop the research capabilities and acumen for pursuing research in English language andLiterature

Course (Paper) Name and No.: Political Reading of Literature III _ PAR4PRL

CO1   Demonstrate nature of monarchic ideologydepicted in literary works

CO2   Apply colonialism and imperialism as an ideologyto literature with suitable examples

CO3   Examine the politics of race, class and gender inrepresented in English literature

CO4   Discuss the nature of politics in literature andreflection in reality

Course (Paper) Name and No.: Project Writing IV _ PAR4PWT

CO1   Apply basic tools of research in selected domainsof study

CO2   Examine Research Methodology used in languageand literature

CO3   Determine the scheme of chapterization in theresearch project

CO4   Create a dissertation pertaining to the researchtopic successfully

C. Hindi

Course (Paper) Name and No.: Modern Prose _ PAR4HN10

CO1 उपन्यास के अध्ययन से छात्र डॉ.बाबासाहेब आंबेडकर के व्यक्तित्य एवं कृतित्व को समझ सकेंगे ।

CO2 नाटक विधा के अध्ययन से छात्र संपूर्ण विश्व के अंधत्व से पीड़ित व्यक्तियों की समस्याओं से परिचित हो सकेंगे।

CO3 छात्र उपन्यास तथा नाटक के तत्वों के माध्यम से उन विधाओं का समीक्षात्मक विवेचन कर सकेंगे ।

CO4 कहानियों के अध्ययन से छात्र भारतीय संस्कृति, मानवीयता, जातीयता,एवं पारिवारिक जीवन परिचय प्राप्त कर सकेंगे ।

CO1 उपन्यास के अध्ययन से छात्र डॉ.बाबासाहेब आंबेडकर के व्यक्तित्य एवं कृतित्व को समझ सकेंगे ।

Course (Paper) Name and No.: Modern Poetry _ PAR4HN12

CO1 बौद्ध दर्शन, अंतः और बाह्य जगत् की एकाकारता, आत्मा और परमात्मा, व्यष्टि और समष्टि का तादात्म्य साहित्य, संगीत, कला, आस्वादन की प्रक्रिया को छात्र अपने आप में आत्मसात कर सकेंगे ।

CO2 धूमिल की कविताओं के अध्ययन से छात्र कविताओं से परिचित हो सकेंगे तथा कविताओं के मूल अर्थ को समझ सकेंगे ।

CO3 कविताओं में उभरने वाली अर्थ व्यंजनाओं, भाषा और रचना-प्रक्रिया से परिचित हो सकेंगे ।

CO4 दलित कविताओं के अध्ययन से छात्र भारतीय दलितों के जीवन की करुण व्यथा तथा भाग्य, ईश्वर, नियति के विरूद्ध उनके पीछे व्याप्त स्वार्थ एवं षड्यन्त्र से परिचित हो सकेंगे ।

Course (Paper) Name and No.: Jansanchar Madhyam_PAR4HN14

CO1 Explain what the term "mass media" means, what it entails, and how it works.

स्पष्ट करना कि है अर्थ क्या का शब्द "मीडिया मास", इसमें क्या शामिल है, और यह कैसे काम करता है।

CO2 Identify the different characteristics of languages used by the media, such as film, radio and television language.

मीडिया द्वारा उपयोग की जाने वाली भाषाओं की विशेषताओं की पहचान करना, जैसे फिल्म, रेडियो और टेलीविजन की भाषा।

CO3 Evaluate that social media has a significant influence in the evolution of society

विश्लेषण करना कि समाज के विकास में सोशल मीडिया का महत्वपूर्ण प्रभाव है|

CO4 Discuss many types of media writing, such as news writing, feature writing, radio play writing, and so on.

कई प्रकार के मीडिया लेखन पर चर्चा करना, जैसे समाचार लेखन, फीचर लेखन, रेडियो नाटक लेखन, आदि।

Course (Paper) Name and No.: Project Writing _PAR4HN16

CO1   अनुसंधान की पद्धति तथा उसके तत्वों से परिचित होंगे।

CO2   अनुसंधान का अर्थ, परिभाषा एवं विशेषताओं समझ सकते हैं

CO3   शोध प्रविधि, शोध का महत्त्व, शोध के प्रमुख सोपान, शोध की प्रेरणा, शोध के उद्देश्य, शोध दृष्टिकोण, शोध-प्रक्रिया, शोध-प्रक्रिया के विविध चरण, विषय-निर्धारण आदि अनुसंधान की जानकारी प्राप्त कर अच्छा प्रबंध लिख सकेंगे।

CO4   शोध की रूपरेखा, सामग्री संकलन, शोध प्रबंध लेखन, सन्दर्भ ग्रंथ सूची की पद्धति, आदि अनुसंधान के अंगों से परिचित होकर समीक्षा कर सकेंगे।

Faculty of Commerce

Programme- B.Com

Programme Outcomes

PO1   After completing three years for Bachelors in Commerce (B.Com) programme, students would gain Knowledge in the fundamentals of Commerce, Accountancy, Management and all allied subjects

PO2   The commerce focused curriculum offers a number of specializations which would equip the student to face the modern-day challenges in commerce and business and they will be prepared to accept responsibilities in the business world

PO3   Empowerment of learners through access to commerce education and enabling them to develop as intellectually active, socially responsible citizens always ready for continuous personal and professional growth to fit into the challenging business environment

PO4   Inculcate the element of research amongst the learners, to develop their overall personality

Department of Accounting and Finance

Program Specific Outcomes

PSO1 Understand the concept, development of experimental and analytical skills, developing the aptitude for academic and professional skills, acquiring basic concepts and understanding of hyphenated techniques, understanding the fundamental Accounting & Finance processes and rationale towards application of Accounting & Finance knowledge are among such important aspects.

PSO2 Acquire the knowledge, skill in different areas of communication, decision making, innovations and problem solving in financial and business activities.

PSO3 Get platform to pursue professional courses such as Chartered Accountants, Cost and Management Accountant, MBA, etc.

PSO4 To do their higher education and can make research in the field of accountancy and Finance.

PSO5 To develop ICT skill and knowledge among learners in applications of internet in education leads to benefit in e-Governance.

PSO6 Update the knowledge about the business law, taxation law corporate law and industrial law.

Department of Management Studies

Programme Specific Outcomes

PSO1   Will create operational cadre management personnel

PSO2   Develop the lateral thinking, communication skills and social responsibilities among learners

PSO3   Strengthen the analytical, interpersonal organization and decision making skills through presentations and seminars.

PSO4   Adequate exposure to operational environment in the field of management

PSO5   Encourage and inculcate the use of modern technology to solve the practical problems in the real world

PSO6   Will prepare learners for future career success by encouraging them to develop necessary tools and skills, including written and oral communication skills, an ability to work with others, leadership qualities, and a capability to creatively solve problems

Programme- M.Com. (Advanced Accountancy)

Programme Outcomes

PO1   After completing two years for Masters in Commerce (M.Com) programme, students would gain knowledge in conventional as well as contemporary areas in the discipline of Commerce and Accountancy.

PO2   The Commerce and Accountancy focused curriculum offers specialization in various areas of Accountancy which would equip the student to face the modern-day challenges in commerce and business and they will be prepared to accept responsibilities in the business world

PO3   To enable the students for conducting business, accounting and auditing practices

PO4   Learners will be able to prove proficiency in pursuing higher and professional studies and advance research in various disciplines of commerce

PO5   Inculcate the element of research amongst the learners through projects, to develop their overall personality

Programme- M.Com. (Business Analytics)

Programme Outcomes

PO1   Acquire conceptual, fundamental and application-based knowledge in Business Analytics, Data Science, Business Intelligence, Artificial Intelligence, Financial Modelling, Business Modelling, Financial analytics, HR and Marketing Analytics.

PO2   Apply data visualization tools for development of Business modelling & Financial Modelling.

PO3   Prepare, analyze, Evaluate and interpret financial statements as per Indian AS by applying critical thinking skills, analytical skills and problem-solving skills.

PO4   Analyze the Human Resources, Marketing & supply chain management model through big data and data mining techniques

Faculty of Commerce

Class: F.Y.B. Com.

Semester I

Course (Paper) Name and No.: Commerce I

CO1 Explain concept of Business , Objectives of Business and New Trends in Business.

CO2 List Constituents of Business Environment, Impact of WTO and Trading Blocs.

CO3 Discover Project Planning, Promotion of Business Unit and statutory Requirement in promoting Business Unit.

CO4 Develop Competencies of Entrepreneurship.

Course (Paper) Name and No: Accountancy and Financial Management - I

CO1 Define the accounting standards.

CO2 Solve LLP concern final account.

CO3 Solve departmental final account.

CO4 Compare Bank Balance and Cash Balance

Course (Paper) Name and No: Business Economics- Paper no. I

CO1 Learners understand the basic tools to analyze the business economics.

CO2 Learners are able to understand the elasticity of demand forecasting.

CO3 Learners studied the theories related to production function.

CO4 Learners are now in a position to understand different concepts of costs

Course (Paper) Name and No.: Paper No. I - Environmental Studies

CO1 Understand comprehensibly the concept of environment and ecosystem.

CO2 Understanding the natural resources and need and measures for sustainable development.

CO3 Understand the population and emerging issues of development

CO4   Understand the urbanization and environment.

CO5   Read the thematic maps and fill the world map.

Course (Paper) Name and No.: Business Communication I

CO1   To recognize importance of business communication in corporate world.

CO2   To differentiate between formal and informal communication.

CO3   To understand the use of technology in the process of communication.

CO4   To acquire the skills of drafting various business letters.

CO5   To understand the importance of presentation and interview skills.

Course (Paper) Name and No.: Mathematical & Statistical Techniques-I

CO1   Explain shares, mutual funds, permutation, combination and LPP

CO2   Apply Summarization Measures to solve the examples

CO3   Find the probability

CO4   Solve the problems by using decision theory criterions

Course (Paper) Name and No.: Basic Course in Mathematics and Statistics

CO1   Student will be able to make use of the basic concepts of mathematics and statistics.

CO2   Student will be able to define the function, types of functions and derivatives.

CO3   Student will be able to apply Summarization Measures to solve the examples.

CO4   Student will be able to determine the probability

Semester II

Course (Paper) Name and No.: Commerce II

CO1   Explain Concept of service, Marketing Mix for Services and service strategies.

CO2   Summarize Retailing, its format and Retail scenario.

Course (Paper) Name and No: Accountancy and Financial Management - II

CO1   Define the conversion method in incomplete records of accounting.

CO2   Find del-creder commission in consignment accounts.

CO3   Construct the Branch Profit or Loss

Course (Paper) Name and No: Business Economics- Paper no. II

CO1   Learners get the knowledge of perfect competition and monopoly markets

CO2   Learners are now able to discriminate monopolistic competition and oligopoly markets.

CO3   Learners studied the different pricing practices adopted by the firm.

CO4   Students studied the theories capital budgeting.

Course (Paper) Name and No.: Paper No. I - Environmental Studies

CO1   Understand the solid waste management and role of society in solid waste management.

CO2   Understanding the environmental problems associated with agriculture and sustainable agricultural practices.

CO3   Understand the Tourism potentials and challenges before India.

CO4   Understand the environmental movements and environmental management in India.

CO5   Able to fill the environmentally significant features in Mumbai and Konkan region map.

Course (Paper) Name and No.: Business Communication II

CO1   To recognize importance of business communication in corporate world.

CO2   To differentiate between formal and informal communication.

CO3   To understand the use of technology in the process of communication.

CO4   To acquire the skills of drafting various business letters.

Course (Paper) Name and No.: Mathematical & Statistical Techniques-II

CO1   Find the derivative, interest and annuity

CO2   Apply Bivariate Linear Correlation and Regression to solve the examples

CO3   Predict the future values by using time series methods and will able to find index numbers

CO4   Solve the problems of probability distribution

Course (Paper) Name and No.: Learning Mathematics and Statistics using Software's

CO1   Student will be able to make use of the basic commands of Excel and GeoGebra.

CO2   Student will be able to solve the problems of Correlation and Regression, Time series and Probability Distribution by using Excel.

CO3   Student will be able to determine maxima and minima of the function by using GeoGebra

CO4   Student will be able to solve the problems of Probability Distribution by using GeoGebra.

Class: S.Y.B. Com.

Semester III

Course (Paper) Name and No.: Accountancy and Financial Management – III

CO1   Find Purchase consideration in amalgamation of Firms.

CO2   Solve the partnership final A/c , with respect to admission, retirement and death from partnership firm

CO3   Inspect the accounting treatment for Piecemeal Distribution of Cash

CO4   Construct the hire purchase Table and journalized the transactions

Course (Paper) Name and No: Financial Accounting & Auditing – V Management Accounting

CO1   Analyze various ration like balance sheet ratio and Revenue statement ratio

CO2   Analyzing Interpret financial statement of company

CO3   Compose cash flow statement

CO4   Formulate Capital Budgeting

Course (Paper) Name and No: Business Economics- Paper no. III

CO1   Define the basic concepts of macroeconomics and national income

CO2   Explain the Keynesian theories related to macroeconomics.

CO3   Evaluate the different post of Keynesian developments in macroeconomics.

CO4   Examine the relationship between supply of money and demand for money for the estimation of inflation

Course (Paper) Name and No.: Advertising- I

CO1   Explain Integrated Marketing Communication, advertising & classification of advertising.

CO2 Analyse advertising agency, agency & client & career in advertising.

CO3 Identify economic & social aspects of advertising.

CO4 Know the Importance of Brand building, special purpose advertising & trends in advertising.

Course (Paper) Name and No.: Business law- I

CO1 Define the various aspects of Indian Contract act 1872.

CO2 Explain the concept of Special Contracts.

CO3 Analyse the sale of goods act 1930.

CO4 Explain the Negotiable Instrument act 2015 & Information Technology act 2000.

Course (Paper) Name and No.: Commerce III (Management Functions and Challenges)

CO1 Explain evolution of Management thought, and modern Management Approach.

CO2 Apply concept of planning, MBO, Decision making.

CO3 Analyse concept of organising, Departmentation and delegation of Authority.

CO4 Develop Leadership Traits, Motivation and Controlling Attitude.

Course (Paper) Name and No.: Computer Programming Paper- I

CO1 To give brief knowledge of computer hardware, software and system.

CO2 To understand all functionality of Word.

CO3 To use excel in different functions corresponding to different scenario.

CO4 To perform operations in excel as per the need

Semester IV

Course (Paper) Name and No.: Commerce IV

CO1   Illustrate Concept of Production Management, Production system and Inventory Management.

CO2   Infer Dimension of quality, Quality circle and Service Quality Management.

CO3   Analyse Functioning of Indian Financial Market, SEBI , Stock Exchange and Credit Rating Agencies.

CO4   Compare Recent Trends in Finance like Mutual Fund, Commodity Market, Derivative Market, Start up venture,Micro Finance and Managing Finance during Pandemic.

Course (Paper) Name and No.: Accountancy & Financial Management IV

CO1   Define the basic of issue, of shares and debentures

CO2   Summarized the concept of accounting software

CO3   Analyze the company income statement between pre and post period on the basis of incorporation

CO4   Determine the company laws conditions and relate to redemption of Preference Shares

Course (Paper) Name and No.: Financial Accounting and Auditing – Auditing

CO1   Explain concept of Auditing

CO2   Outline Audit plan, procedure and Documentation

CO3   Interpret audit techniques ,internal audit, internal control

CO4   Evaluate audit techniques like vouching & verification

Course (Paper) Name and No: Business Economics- Paper no. IV

CO1   Define the basic concepts of public finance.

CO2   Analyze the tax and non-tax revenues of the government.

CO3   Evaluate the theories of public expenditure and public debt of the government.

CO4   Modify the budget and other policies of the government.

Course (Paper) Name and No.: Advertising- II

CO1   Classify the various medias in advertising.

CO2   Explain advertising budget, advertising campaign & media planning.

CO3   Analyse the fundamentals of creativity, creativity aspects & creativity through endorsement.

CO4   Know the Importance of execution & evaluating of advertising.

Course (Paper) Name and No.: Business law-II

CO1   Explain the Indian Companies act 2013.

CO2   Summarize the Indian Partnership act 1932.

CO3   Determine the structure, objective & working procedure of consumer protection act 1986 & competition act 2000.

CO4   Evaluate the Intellectual property rights.

Course (Paper) Name and No.: Computer Programming- II

CO1   Students should be able to understand the concepts of programming before actually starting to write programs.

CO2   To acquire Object Oriented Skills in Python

CO3   Students should be able to develop logic for Problem Solving.

CO4   Students should be made familiar about the basic constructs of programming such as data, operations, conditions, loops, functions etc.

Class: T.Y.B. Com.

Semester V

Course (Paper) Name and No.: Commerce V (Marketing)

CO1   Summarise the concepts of Marketing , Marketing research and Consumer behaviour,

CO2   Explain the various aspects and importance of marketing decision making

CO3   Analyze the Emerging trends in selling and Skill Sets required for Effective Selling

CO4   Examine the various key marketing dimensions and marketing during a pandemic

Course (Paper) Name and No.: Financial Accounting & Auditing – VII

CO1   Find the capital Reserve in internal Reconstruction

CO2   Build Investment Account of a particular person and ethical behavior and its implications for accountants.

CO3   Testing the applicability of Buy Back conditions

CO4   Categorize the assets and liabilities in vertical format.

Course (Paper) Name and No.: Financial Accounting and Auditing VIII (Cost Accounting)

CO1   Explain the concept of Cost Accounting, cost centre, Cost Unit, Elements of Cost, Coding System.

CO2   Apply the concept of Material cost, Stock Levels, Inventory control, EOQ and Stock Turnover Ratio.

CO3   Solve Practical Problems on Labour Cost and Overheads.

CO4   Construct Cost Sheet and Reconciliation of Cost and Financial Statement.

Course (Paper) Name and No.: Business Economics- Paper no. V

CO1   Recall the economic policies of the government of India.

CO2   Illustrate the agricultural policies of India.

CO3   Criticize the industrial and service sector policies of the government of India.

CO4   Examine the financial markets of India

Course (Paper) Name and No.: Marketing Research-I

CO1   Summarize the various introductory aspects of marketing research

CO2   Enable the student to plan marketing research

CO3   Analyze the various sources of data collection

CO4   Examine data processing, analysis and reporting

Course (Paper) Name and No: Export Marketing Paper –I

CO1   Summarize concepts of export marketing

CO2   Identify global framework of export marketing

CO3   Discover export incentives and assistance

CO4   Explain India's foreign trade policy

Course (Paper) Name and No: Direct & Indirect Tax I

CO1   Summarize the basic concept, of Income Tax and Residential Status

CO2   Apply Various deduction from Total Income

CO3   Assess the income from Salaries, house property, capital Gain and Business Income

CO4   Solve the Computation of Total Income for Individual and filling ITR-1 Form

Semester VI

Course (Paper) Name and No.: Commerce VI (Human Resource Management)

CO1   Explain the concepts of Human Resource Management

CO2   Summarize the various aspects of Human Resource Development

CO3   Examine the importance of Human relations

CO4   Analyze the various aspects of leadership, motivation, employee morale, employee grievance and their effective management in organizations

Course (Paper) Name and No.: Financial Accounting and Auditing Paper IX

CO1   Solve problems on foreign currency

CO2   Determine the net profit or Loss and Assets and Liabilities of Limited Liability Partnership Firm

CO3   Compose the table of Net liability in Underwriting of Shares and Debentures

CO4   Solve Purchase Consideration for amalgamation, absorption and external reconstruction

Course (Paper) Name and No.: Financial Accounting & Auditing X (Cost Accounting)

CO1   Apply the concept of Budgetary control for preparing Cash budget.

CO2   Solve Problems on Process Costing

CO3   Evaluate Concept of Contract Costing and Marginal Costing

CO4   Compare the Actual cost with Standard cost and able to do variance Analysis.

Course (Paper) Name and No.: Business Economics- Paper no. VI

CO1   Explain the theories of international trade.

CO2   Distinguish between various commercial policies adopted by various organizations in the world.

CO3   Evaluate the balance of payments and the agreements of WTO.

CO4   Illustrate the foreign exchange market.

Course (Paper) Name and No.: Marketing Research-II

CO1   Explain the various aspects of Product, brand and price research

CO2   Outline the various aspects of physical, promotion, advertising and consumer research

CO3   Analyze sales research, rural marketing research and global research

CO4   Determine how to manage marketing research activities and few prominent marketing research agencies

Course (Paper) Name and No: Export Marketing Paper –II

CO1   Outline export distribution channels and promotion techniques.

CO2   Apply product planning labeling and pricing decision for export marketing

CO3   Explain the procedures and role of various financial institutions for export finance.

CO4   Discuss export procedure and documentation.

Course (Paper) Name and No: Direct & Indirect Tax II

CO1   Find the taxable and non-taxable supplies

CO2   Outline the basic concept of Indirect Taxes (Goods and Service tax).

CO3   Understanding- Lower CO3 Determine the Time, Place and Value of Supply

CO4   Solve Input Tax Credit & Payment of Tax and Registration under GST Law

Class: F.Y.B. Com. (Accounting & Finance)

Semester I

Course (Paper) Name and No.: Financial Accounting I

CO1   Describe various concept of accounting standard and Indian Accounting Standards

CO2   Solve practical problems regarding inventory valuation by FIFO and weighted average method.

CO3   Prepare the final account of manufacturing concern.

CO4   Calculate the various ratios and prepare the Departmental Final account.

CO5   Estimate hire purchase price and calculate interest on hire purchase transactions.

Course (Paper) Name and No.: Cost Accounting I

CO1   Describe the various concepts of cost, costing and cost accounting.

CO2   Calculate stock levels, economic order quantity and prepare stock ledger.

CO3   Evaluate different techniques of calculating employee cost and measurement of direct expenses.

CO4   Discuss the various concepts and methods of allocation, apportionment and absorption methods of overheads and calculate overhead rate.

Course (Paper) Name and No.: Management I

CO1   Explain the various aspects of Financial Management and to describe types of finance

CO2   Explain how operating leverage contributes to a firm's business risk and apply financial leverage to form long term financial policies for business

CO3   Calculate time value of money

CO4   Define and measure the cost of capital and calculate WACC

Course (Paper) Name and No.: Communication I

CO1   Demonstrate the outline theory of business communication.

CO2   Analyze formal and informal communication present and business organization.

CO3   Examine methods of communication and identify different barriers to successful communication.

CO4   Formulate various types of commercial letters effectively.

Course (Paper) Name and No.: Commerce I

CO1   Describe the business and business environment.

CO2   Describe the business ethics and demonstrate the knowledge of MSMED.

CO3   Explain corporate social responsibility and social audit and various aspects of consumer protection law.

CO4   Evaluate different strategies for setting up the business at global level under an international business environment.

Course (Paper) Name and No.: Business Economics I

CO1   Define the concepts related to business and its application.

CO2   Illustrate the fundamentals of demand and supply.

CO3   Make use of various production techniques to understand the functioning of productive units in the economy.

CO4   Compose various cost and pricing methods used in the market by the firms.

CO5   Interpret different types of market structure in the economy.

Course (Paper) Name and No.: Foundation Course I

CO1   Summarize overview of Indian Society.

CO2   Identify various forms of Disparity in Society.

CO3   Explain Constitutional Values and Democratic Principles.

CO4   Discuss various aspects of Indian Political Process

Semester II

Course (Paper) Name and No.: Financial Accounting II

CO1   Discuss various aspects of fire insurance claim and compute amount of claim for loss of stock and profit

CO2   Discuss the various aspects of the consignment account and calculate commission's normal loss, Abnormal losses and prepare accounting for consignment account.

CO3   Classify the branches and prepare branch account under different method.

CO4   Prepare the final Account of Proprietary trading concern from incomplete records.

Course (Paper) Name and No.: Auditing I

CO1   Define auditing and discuss principles of audit, types of audit errors and frauds and other concepts of auditing.

CO2   Describe audit planning, audit programme, audit working papers and audit note book.

CO3   Define internal audit, its objectives, scope, principles, and usefulness and distinguish between internal audit and statutory audit.

CO4   Explain and evaluate audit techniques.

Course (Paper) Name and No.: Financial Services

CO1   Describe the role and functions of financial services, factoring, forfaiting and bill discounting.

CO2   Explain the knowledge of various intermediaries such as merchant bankers, underwriters, stock brokers and securitization.

CO3   Explain consumer finance, credit ratings and types of plastic money and its growth.

CO4   Develop the knowledge of financial services such as lease and hire purchase, housing finance and venture capital and its mechanism.

Course (Paper) Name and No.: Communication II

CO1   Identify different types of interviews organized in the commercial world.

CO2   Construct business letters effectively.

CO3   Analyze the mechanism of meetings, conferences and its application in the business world.

CO4   Develop effective presentation skills necessary in the corporate world.

Course (Paper) Name and No.: Business law I

CO1   Define various components under Law of Contract, Sale of Goods Act, Negotiable Instrument Act and Consumer Protection Act.

CO2   Describe various components of Negotiable Instrument and its uses in Financial transactions.

CO3   Demonstrate the knowledge of Consumer Protection Council, Consumer Dispute Redressal Agencies.

CO4   Demonstrate the comprehensive knowledge of Indian Contract Act and draft legal agreement & MOU.

CO5   Discuss various aspects of the Sale of Goods Act and prepare Hire Purchase Agreement.

Course (Paper) Name and No.: Business Mathematics

CO1   Demonstrate concept of shares and mutual funds.

CO2   Apply various formulas for simple and compound interest, EMI's, Functions and their applications.

CO3   Solve various problems of derivatives and apply optimization technique in economic.

CO4   Evaluate matrix operations and determinants of a matrix.

Course (Paper) Name and No.: Foundation Course II

CO1   Describe the concept of Globalization and its impact on Indian Society.

CO2   Classify various human rights and its journey of evolution.

CO3   Explain Concept of Stress, Conflicts and Managing Stress and Conflicts in
      Contemporary Society.

CO4   Discuss concepts of Ecology, Sustainable Development and different causes of Environment
      Degradation.

Class: S.Y.B. Com. (Accounting and Finance)
Semester III

Course (Paper) Name and No.: Foundation course III

CO1   Outline Indian Financial System

CO2   Summarize financial market system

CO3   Explain different types of financial instruments

CO4   Evaluate different financial services

Course (Paper) Name and No.: Auditing II

CO1   Describe the knowledge of auditing standards

CO2   Explain the various procedure of appointment of auditors

CO3   Apply verification techniques, vouching techniques for audit of assets and liabilities.

CO4   Examine income and expenditure.

Course (Paper) Name and No.: Principle and practice of banking

CO1   Describe the knowledge of Indian financial system

CO2   Demonstrate bank and related issues of bank

CO3   Make use of banking technology in payment system

CO4   Evaluate consumer behavior and product pricing in banking system

Course (Paper) Name and No.: IT in Accountancy I

CO1   Describe history and parts of computers and demonstrate the knowledge of hardware, software and networks.

CO2   Describe various emerging technologies in the world of technology.

CO3   Apply and demonstrate the knowledge of office productivity tools for drafting, data processing and presentation

CO4   Make use of E-commerce & M-commerce in personal and professional life & analyze the impact of e-commerce and m-commerce for developing business models & strategies.

Course (Paper) Name and No.: Financial Accounting III

CO1   Demonstrate the effects on financial statements in case of admission, retirement and death of a partner during the year.

CO2   Describe the concept of profit prior to incorporation and calculate the different ratios for determining the profit/loss for pre and post-incorporation period.

CO3   Calculate purchase consideration and evaluate the effect of amalgamation/conversion in the Balance Sheet.

CO4   Prepare and evaluate a statement of piecemeal distribution of cash under different methods.

Course (Paper) Name and No.: Taxation II

CO1   Define and describe concepts of income tax

CO2   Determine the residential status of different persons.

CO3   Identify and apply the assesse eligible for deduction for deduction under chapter VI A

CO4   Compute income chargeable to tax under the various heads of income

Course (Paper) Name and No.: Business Economics II

CO1   Understand the basic of national income accounting.

CO2   Understand the cause and consequence of business cycle.

CO3   Understand the role of fiscal and monetary policy.

CO4   Understand the Macro & Micro concepts of economics.

Course (Paper) Name and No.: Cost Accounting II

CO1   Describe process cost account and treatment of Normal loss, Abnormal loss and gain in the preparation of process cost accounting.

CO2   Identify total cost of join product and by product apply method of apportionment of join cost to join product and by product

CO3   Classify different types of cost and determine the total cost of the product.

CO4   Compute notional or estimates profit for contract

Course (Paper) Name and No.: Business Law-II

CO1   Describe various forms of IPR and provision of law with respect to registration of patent, copyright, trade mark.

CO2   Demonstrate the various provisions of limited liability partnership act 2008.

CO3   Acquaint knowledge of various acts of industries.

CO4   Design partnership deed as per partnership act 1932.

Course (Paper) Name and No.: Research Methodology in Accounting and Finance

CO1   Describe various aspects of research methodology

CO2   Demonstrate the research design in accounting and finance

CO3   Make use of various aspects of data collection and processing

CO4   Analyze various statistical tools for testing the hypothesis, Develop research report writing skill

Semester IV

Course (Paper) Name and No.: Information Technology in Accountancy- II

CO1   Describe IT and Business Process Management.

CO2   Demonstrate the knowledge of IT in auditing and information systems.

CO3   Make use of accounting software for recording the accounting transactions.

CO4   Prepare MIS Reports under Computerized Environment

CO5   Design the Computerized Accounting system.

CO6   Develop the knowledge of business Analytics. And financial Analytics.

Course (Paper) Name and No.: Financial Accounting IV

CO1   Describe various provisions of redemption of preference shares as per Companies Act, 2013.

CO2   Determines the underwriter's liability.

CO3   Calculate the maximum permissible limit of buyback of equity shares.

CO4   Determine different methods of redemption of debentures as per the provisions of the Companies Act, 2013.

CO5   Build the final accounts of companies

Course (Paper) Name and No.: Taxation III

CO1   Describe the various provisions of clubbing of income and set off and carry forward losses as per income tax act.

CO2   Compute taxable income of partnership firm

CO3   Demonstrate the knowledge of return of income and self-assessments

CO4   Examine and compute TDs and interest payable as per provision of income tax

CO5   Assess the file of income tax return for individual/HUF and partnership firms.

CO6   Estimate the advance tax liability of the assesse

Course (Paper) Name and No.: Business Law III

CO1   Define various concepts of the Companies Act, 2013.

CO2   Demonstrates the various provisions of the Insolvency and Bankruptcy Code, 2016.

CO3   Evaluate the various provisions of the Companies Act, 2013.

CO4   Elaborate the constitution of the National Company Law Tribunal.

Course (Paper) Name and No.: Auditing III

CO1   Describe various aspects of investigation and due diligences.

CO2   Demonstrate the knowledge of audit under computerized information system environment.

CO3   Make use of professional ethics while conducting the audit procedure.

CO4   Prepare audit report as per provision of company act 2013

Course (Paper) Name and No.:   Business Economics II

CO1   Define the Keynesian concepts of National Income Theory of Income and Employment.

CO2   Interpret the relationship between supply of money and Demand for Money for the estimation of Inflation.

CO3   Identify the role of fiscal and monetary policies in understanding the economy.

CO4   Analyze the impact of international trade on the domestic economy.

Course (Paper) Name and No.: Wealth management

CO1   Define and explain the various aspects of wealth management.

CO2   Describe operational aspects of the wealth management

CO3   Calculate interest, DCIF and compare valuation of shares and bonds.

CO4   Analyses wealth management process

CO5   Develop wealth management plan

Course (Paper) Name and No.: Management Accounting

CO1   After completing the Programme in B. Com. Accounting and Finance, Student will able to:

CO2   Describe the comprehensive knowledge of management accounting

CO3   Prepare cash budget and cash flow statement

CO4   Analyze and interpret the financial statements by using different accounting techniques

Course (Paper) Name and No.: Foundation Course IV

CO1   Describe basic management concepts

CO2   Apply the concept of planning and organizing

CO3   Classify the procedure of staffing

CO4   Elaborate importance and principles of directing, motivation, coordination, and controlling

Class: T.Y.B. Com. (Accounting and Finance)

Semester V

Course (Paper) Name and No.: Taxation - III

CO1   Describe various provisions relating to utilization of Input Tax Credit.

CO2   Explain the concept of GST and discuss the framework of GST.

CO3   Explain and Compute the provisions relating to place of supply, Time and Value of

CO4   supply Determined Person liable for Registration and compute the GST liability of a

registered person.

Course (Paper) Name and No.: Financial Management II

CO1   Describe the financial concepts used in strategic financial management

CO2   Explain the various capital structure theories and to demonstrate the dividend

decision models

CO3   Apply the different techniques of capital budgeting for effective decision making

CO4   Calculate NAV with respect to mutual funds and ascertain the valuation of bond

CO5   Compare and evaluate different policies under receivable and payable management

Course (Paper) Name and No.: International Finance

CO1   Explain future and option of derivatives and calculate various components of

derivatives options and futures.

CO2   Determination foreign exchange market and dealing in forging exchange market.

CO3   Determine exchange rate and to make comparison of different currencies.

CO4   Summaries various component of International financial management and evaluate

the project by Applying various capital budgeting techniques.

Course (Paper) Name and No.: Cost Accounting III

CO1 Describe the uniform costing and inter-firm comparison.

CO2 Explain cost accounting system and prepare reconciliation statement.

CO3 Determine the cost and cost of service sector industry.

CO4 Calculate cost per equivalent unit by applying FIFO and Weighted average method and preparation of process cost accounting.

CO5 Determine and analyze the total cost under traditional and ABC system

Course (Paper) Name and No.: Financial Accounting V

CO1 Describe the block chain accounting.

CO2 Summarize the accounting entries based on GST.

CO3 Prepare the statement of affairs and liquidators final statement and consolidated financial statement.

CO4 Calculate purchase consideration and evaluate the effect of amalgamation/conversion in the Balance Sheet.

CO5 Discuss various methods and legal provisions of internal reconstruction.

Course (Paper) Name and No.: Financial Analysis and Business Valuation

CO1 Describe different techniques of financial modelling and project appraisal.

CO2 Demonstrate the various aspects and models of the valuation of the business.

CO3 Analyze the financial statements

CO4 Determine the value of assets and liabilities

Course (Paper) Name and No.: Financial Accounting VI

CO1 Describes the legal provision and prepare financial statement of a banking company and the insurance company.

CO2 Demonstrate the comprehensive knowledge of regulation governing non-banking

financial companies and preparation of the financial statement.

CO3   Calculate the goodwill and value per share by applying different methods.

CO4   Discuss the statutory provisions of conversion of partnership business into Limited liability partnership and preparation of the final accounts.

Course (Paper) Name and No.: Management II

CO1   Describe the various avenues of the marketing management.

CO2   Demonstrate comprehensive knowledge of human resource management and application of various related theories.

CO3   Explain the different aspects of production management.

CO4   Discuss and analyze various techniques of financial management.

Semester VI

Course (Paper) Name and No.: Taxation - IV

CO1   Describe various kinds of ledgers/Registers to be maintained by the taxable person.

CO2   Describe the basic concepts relating to export promotion schemes under FTP

CO3   Compute the payment of Taxes and Refunds and Explain the procedure of accounting, Auditing & assessments.

CO4   Analyze the provisions relating to TDS & TCS.

CO5   Discuss the provisions relating to Custom Laws and determine the procedure for clearance of imported and exported goods.

Course (Paper) Name and No.: Financial Management III

CO1   Describe various concepts in valuation and to make use of different approaches of valuation

CO2   Explain the modes of acquiring another firm and to determine the exchange ratio for evaluation of mergers

CO3   Explain the various aspects of corporate restructuring and takeovers and prepare balance sheet after reconstruction

CO4   Apply the knowledge of lease and hire purchase financing and analyze the NPV under lease and purchase

CO5   Evaluate working capital management policies and the risk

Course (Paper) Name and No.: Security Analysis and Portfolio Management

CO1   Summarize the Concept of Portfolio management and its process.

CO2   Describe theory of Valuation and Calculate Alternative method of Valuation

CO3   Evaluate Dow theory and Calculate Mathematical Indicators and Market Indicators.

CO4   Discuss and Calculate Economy Analysis, Industry Analysis and Company Analysis.

CO5   Summarize the Concept of Portfolio management and its process.

Course (Paper) Name and No.: Financial Accounting VII

CO1   Describe the legal provisions and prepare the final accounts of electricity companies and co-operative societies.

CO2   Demonstrate the knowledge of IFRS and Indian standards

CO3   Classify fixed and variable income bearing securities and calculate ex-interest and cum-interest price and weightage average cost.

CO4   Analyze accounting policies for maintain accounting of foreign branches.

CO5   Discuss the various mutual fund schemes, calculate NAV and prepare the accounting entries.

Course (Paper) Name and No.: Management Control Systems

CO1   Describe the various development in management accounting and management control systems.

CO2   Analyze the various statements of financial goals set.

CO3   Measure the performance under responsibility centers.

CO4   Discusses methods of inflation accounting.

Course (Paper) Name and No.: Indian Economy

CO1   Define the concepts of Indian Economy and Agricultural Sector.

CO2   Illustrate the service sector and industrial sector of India.

CO3   Examine money and banking sectors in India.

CO4   Evaluate Industrial sector and industrial policy of India

Course (Paper) Name and No.: Cost Accounting IV

CO1   Describe various types of budget and prepare flexible and personal budget

CO2   Discuss the absorption costing and marginal costing and calculate marginal cost of the product

CO3   Explain different policies under transfer pricing and calculate transfer price

CO4   Calculate and analyze the variances under the standard costing system.

CO5   Evaluate various schemes for managerial decision making

Course (Paper) Name and No.: Project Work

CO1   Explain the various aspects of writing research methodology based on project

CO2   Apply various statistical and accounting techniques for testing the hypothesis

CO3   Analyze and interpret the data

CO4   Develop research project writing skills and draft research project

Class: F.Y.B.M.S.

Semester I

Course (Paper) Name and No.: Introduction to Financial Accounts

CO1   Demonstrate basic knowledge of concepts, theories, principles and standards used in financial accounting.

CO2   Apply accounting concepts for transaction recording

CO3   Develop ability to prepare financial statement of the company

CO4   Interpret information in the financial statement of the organization

Course (Paper) Name and No.: Business Law

CO1   Apply basic legal knowledge to business transactions in their future and identify the fundamental legal principles behind contractual agreements.

CO2   Classify the negotiable instrument and legal environment of the business.

CO3   Determine the legal and fiscal structure of different forms of business organisations and their responsibility as an employer.

CO4   Interpret the various provisions related to Intellectual Property Rights, its applicability, duration and registration procedures.

Course (Paper) Name and No.: Business Statistics

CO1   Explain fundamentals of statistics and different types of data

CO2   Analyse information using numerical data and graphical charts

CO3   Interpret statistical analysis tools to make business decisions

CO4   Evaluate performance of the business or company and identify trends

Course (Paper) Name and No.: Business Communication

CO1   Demonstrate the outline of theory of Business Communication

CO2   Apply formal and informal communication present in business organization

CO3   Examine methods of communication and identify different barriers to successful communication

CO4   Formulate various types of commercial letters effectively

Course (Paper) Name and No.: Foundation of Human Skills

CO1   Develop and nurture a deep understanding of personal motivation.

CO2   Evaluate and improve upon personal leadership strengths and weaknesses

CO3   Explain the importance of social responsibility & social ethics

CO4   Elaborate, lead and also guided by the values of self-awareness, equity, social justice, inclusiveness, empowerment, collaboration, citizenship.

Course (Paper) Name and No.: Business Economics I

CO1   Define the concepts related to business economics and its applications.

CO2   Illustrate the fundamentals of demand and supply.

CO3   Make use of various production techniques to understand the functioning of productive units in the economy.

CO4   Interpret different types of market structures in the economy.

Course (Paper) Name and No.: Foundation Course I

CO1   Summarize overview of Indian Society.

CO2   Identify various forms of Disparity in Society

CO3   Explain Constitutional Values and Democratic Principles.

CO4   Discuss various aspects of Indian Political Process.

Course (Paper) Name and No.: Personality Development –I

CO1   Describe how the personality develops.

CO2   Define stages of personality development and basic personality traits.

CO3   Explain how morals are developed.

CO4   Discuss personality theories about development

Semester II

Course (Paper) Name and No.: Principles of Marketing

CO1   Define the concept of marketing and introduction of basic parts

CO2   Illustrate the marketing environment consisting of micro and macro also consumer behavior

CO3   Explain marketing mix in details

CO4   Discuss concept of Segmentation, Targeting and positioning also new trends in marketing

Course (Paper) Name and No.: Industrial Law

CO1   Summarize the concept of Industrial relations and industrial disputes and will be able to illustrate the role of trade union in the industrial setup.

CO2   Explain the law related to health, safety and welfare measures in industry and provisions related to employee's compensation.

CO3   Distinguish various provisions in the industry for the employee benefits.

CO4   Identify numerous laws related to compensation and make use of it at the workplace.

Course (Paper) Name and No.: Business Mathematics

CO1   Explain basic mathematical concepts

CO2   Make use of basics of mathematics for financial calculations like simple interest, compound interest, annuity, depreciation, etc

CO3   concepts of mathematical and economical functions

CO4   Predict risk and take decisions accordingly

Course (Paper) Name and No.: Business Communication II

CO1   Interpret different type of interview organized in commercial world

CO2   Apply mechanism of meetings, conferences and its applications in business world

CO3   Construct business letters effectively

CO4   Develop effective presentation skills necessary in corporate world

Course (Paper) Name and No.: Introduction to Cost Accounting

CO1   Learners will be able to differentiate between Financial and Cost Accounting.

CO2   Learners will be able to understand concepts and theories of Cost Accounting.

CO3   Learners will be able to explain Cost elements.

CO4   Learners will be able to interpret various emerging concepts of Costing

Course (Paper) Name and No.: Principles of Management

CO1   Explain the functions and responsibilities of managers & tools and techniques to be used in the performance of the managerial job.

CO2   Analyze and understand the environment of the organization

CO3   Build the leadership capacity and teamwork skills for business decision making.

CO4   Elaborate the knowledge of current theory and techniques of major business discipline.

Course (Paper) Name and No.: Foundation Course II

CO1   Describe the concept of Globalization & its impact on Indian Society

CO2   Classify various human rights & its journey of evolution.

CO3   Discuss concepts of Ecology, Sustainable Development & different causes of Environmental Degradation

CO4   Explain Concept of Stress, Conflicts, and Managing Stress and Conflicts in Contemporary Society.

Course (Paper) Name and No.: Personality Development- II

CO1   Understand and demonstrate knowledge of personal beliefs and values

CO2   Build confidence and overcome the problems associated with personality

CO3   Improve their personality and language related difficulties.

CO4   Develop the basic idea of significance and reasons for personality development and self-grooming.

Class: S.Y.B.M.S.

Semester III

Course (Paper) Name and No.: Basics of Financial Services

CO1   Explain financial markets and its various segments

CO2   Classify different financial institutions and their functions

CO3   Explain the fundamentals of banking and knowledge of banking operations.

CO4   Evaluate different instruments for investment in the financial market.

Course (Paper) Name and No.: Corporate Finance

CO1   Explain different sources of finance

CO2   Utilize tools and techniques for proper business decision making

CO3   Analyse various investment options based on time value of money.

CO4   Evaluate feasibility of the business

Course (Paper) Name and No.: Consumer Behaviour

CO1   Outline the consumer decision making process and its application in marketing function of firms.

CO2   Build the skill of analysing consumer information to create consumer-oriented marketing strategies.

CO3   Analyse the environmental and individual influence on consumers.

CO4   Utilise different Consumer decision-making models in business processes.

Course (Paper) Name and No.: Advertising

CO1   Illustrate the evolution of advertising, its different types and the ethics and laws used in advertising.

CO2   Develop Advertising strategy and apply the same in the marketing mix.

CO3   Design a creative advertisement campaign by making use of the different elements of advertising.

CO4   Examine the growing importance of advertising and career opportunities in advertising.

Course (Paper) Name and No.: Recruitment & Selection

CO1   summarize the process of recruitment & selection & various traditional & modern techniques of recruitment.

CO2   create a job profile by defining accountabilities, standards and competencies.

CO3   describe the skills and knowledge needed to conduct full and fair recruitment and selection.

CO4   conclude the   importance of recruitment & selection, manpower planning, preparation of job description & job analysis & soft skills required for job.

Course (Paper) Name and No.: Motivation and Leadership

CO1   Define the concept of motivation and theories of motivation

CO2   Illustrate the Indian scene & work life balance

CO3   Explain Leadership & theories of leadership & types of leader

CO4   Elaborate great leader & their style , activities also roles of great leader

Course (Paper) Name and No.: Information Technology in Business Management-I

CO1   Demonstrate knowledge of security threats to computer systems and perform counter measures to secure it.

CO2   Analyze the role played by six major types of information systems in organizations and their relationships to each other.

CO3   Define the concept and application of E-mail, Internet and Domain Name System.

CO4   Develop and exhibit proficiency in the use of Word processing, spreadsheet and presentation applications and google forms.

Course (Paper) Name and No.: Foundation Course in Physical Education II

CO1   Explain the principles of nutrition, dietary guidelines and also implement the same for the purpose of improvements.

CO2   Utilizes the knowledge of health to improve physical fitness and apply the parameters to check the health status.

CO3   Make use of knowledge to prevent sports injuries

CO4   Analyse the the importance of sports training without using drugs for performance

Course (Paper) Name and No.: Foundation Course(Environmental Management)III

CO1   Define the concepts about environment, biogeochemical cycles and various types of resources available.

CO2   Classify various types of environment degradation, pollution, and recollect the concept of waste management.

CO3   Formulate solutions to the various environmental problems and challenges faced by us as per the legal and regulatory policies with regards to environment protection.

CO4   Explain methods and approaches for sustainable environmental planning, development and management.

Course (Paper) Name and No.: Business Planning & Entrepreneurial Management

CO1   Explain foundation of Entrepreneurship development & theories of entrepreneurship

CO2   Identify various types & classification of entrepreneurs

CO3   Explain Entrepreneur project development & Business plan

CO4   Discuss Venture development & its importance

Course (Paper) Name and No.: Accounting for Managerial Decisions

CO1   Evaluate and interpret financial statements by using trend %, common size and

comparative.

CO2   Define financial ratios and it's utility in Decision making for organization

CO3   Interpret cash inflows and cash outflows of the business from operating, investing and financial activities

CO4   Examine financial statements with the help of tools and techniques for accounting managerial decisions.

Course (Paper) Name and No.: Strategic Management

CO1   Define business policy and strategies and how does it affect the working of any business organizations.

CO2   Interpret the impact of internal and external environment on strategies of an organization.

CO3   Evaluate various corporate, business and functional level strategies. Also Explain various innovative and creative strategy making models.

CO4   Examine techniques, tools, models and theories of strategic management into practical business world.

Semester IV

Course (Paper) Name and No.: Strategic Cost Management

CO1   Classify main elements of cost

CO2   Estimates the cost incurred for making the product and preparation of cost sheet.

CO3   Make use of tools and techniques to ascertain the cost.

CO4   Determines the value of input units and finished goods under process costing

Course (Paper) Name and No.: Corporate Restructuring

CO1   Tell about formulation and implementation of corporate restructuring.

CO2   Develop understanding of causes, methods and types of restructuring

CO3   Build financial statements of internal & external reconstruction of an organisation.

CO4   Explain pre & post impact of reconstruction.

Course (Paper) Name and No.: Integrated Marketing Communication

CO1   Explain the basic principles of planning and execution in marketing communications.

CO2   Designing an effective advertising and develop sales promotion program.

CO3   Make use of managerial perspective and an informed decision-making ability for Effective and efficient tackling of promotional situations.

CO4   Interpret various range of tools available for marketing communication, and the various facets of advertising, public relation and promotion management.

Course (Paper) Name and No.: Rural Marketing

CO1   Outline the efforts put by the government in rural development and the problems in rural market and the ways to overcome it.

CO2   Identify the nature of competition in rural markets and the use of marketing mix by manufacturers.

CO3   Analyse the various distribution and communication strategies used in rural markets.

CO4   Develop the rural aspects of marketing and consumer behaviour and the abilities to design effective strategies.

Course (Paper) Name and No.: Training & Development in HRM

CO1   Explain the process, importance of training & development & also can interpret advantages of training & development & will also understand how to undertake training needs analysis.

CO2   Evaluate the process of management development.

CO3   Describe the counseling techniques with reference to the development of employees, society & Organization.

CO4   Interpret the process of performance management, appraisals & ethics of appraisal.

Course (Paper) Name and No.: Change Management

CO1   Define Change and its features, importance, levels & types

CO2   Identify the impact of Change & its implementation

CO3   Explain the resistance to change also how to overcome it & the concept of Organizational development

CO4   Discuss the effects of implementation of change

Course (Paper) Name and No.: Information Technology in Business Management

CO1   Infer the basic concepts, scope and application of data warehouse and data mining and big data.

CO2   Identify all components in an ERP system and the relationship among the components.

CO3   Assess various roles MIS have towards strategic goals and operational success of an organization.

CO4   Relate to the relationship between business information needs and decision making with respect to outsourcing

Course (Paper) Name and No.: Foundation Course (Ethics & Governance) - IV

CO1   Define the basic concepts of ethics and Business Ethics.

CO2   Analyze scope of ethics in Compliance, finance, financial market, Human resources, marketing and production.

CO3   Evaluate the theory of corporate governance used by organizations in the day-to-day working.

CO4   Outline the development of Corporate Social Responsibility and the responsibilities of business corporations beyond profit maximization.

Course (Paper) Name and No.: Business Economics-II

CO1   Define the Keynesian concepts of national income, theory of income and employment.

CO2   Interpret the relationship between the supply of money and demand for money for the estimation of inflation.

CO3   Identify the role of fiscal and monetary policies in understanding the economy.

CO4   Analyze the impact of international trade on the domestic economy.

Course (Paper) Name and No.: Business Research Methods

CO1   Define the concept and process of business research in a business environment.

CO2   Plan the use of tools and techniques for exploratory, conclusive and causal research.

CO3   Test the hypothesis using statistical techniques

CO4   Build the analytical abilities and research skills.

Course (Paper) Name and No.: Production & Total Quality Management

CO1   Summarize basics of productivity and total quality management.

CO2   Identify various designing aspects of production systems in different Industries.

CO3   Interpret various certifications and strategies for quality improvement.

CO4   Examine Inventory control techniques and materials management System.

Course (Paper) Name and No.: Foundation Course in Physical Education IV

CO1   Choose the ways and means to avoid stressful situations.

CO2   Build the mindset through the knowledge of rules and scheme of awards of sports

CO3   Apply the yogic exercises to improve performance and concentration in their personal game and work

CO4   How to apply good strategies for healthy life style

Class: T.Y.B.M.S.

Semester V

Course (Paper) Name and No.: Investment Analysis & Portfolio Management

CO1   Identify various short term and long term investment avenues.

CO2   Analyse different concepts of risk and return associated with various investment options.

CO3   Evaluate various investment portfolio using tools & techniques

CO4   Make use of tools and techniques to understand risk - return relationship

Course (Paper) Name and No.: Commodity & Derivatives Market

CO1   Define the meaning of financial derivatives.

CO2   Distinguish between forward futures and options contracts

CO3   Interpret the concept of Derivatives and its types

CO4   Identify about Hedging and the development position of Derivatives in India

Course (Paper) Name and No.: Wealth Management

CO1   Summarize various wealth management aspects through personnel investment planning, retirement planning, etc.

CO2   Assess investment opportunities by implementing wealth management strategies

CO3   Design, manage and evaluate alternative investment portfolios

CO4   Measure performance of portfolios by applying techniques

Course (Paper) Name and No.: Direct Taxes

CO1   Demonstrate the knowledge of concepts, principles and terminologies of income tax law

CO2   Interpret provisions of income tax laws

CO3   Assess computation of taxable income and tax liability

CO4   Develop the understanding of return filing

Course (Paper) Name and No.: Services Marketing

CO1 Define basic concept of service marketing and how does it differs from product marketing.

CO2 Analyse the impact of service recovery efforts on consumer loyalty and key elements of service marketing mix.

CO3 Identify quality aspects and importance of ethics in service marketing.

CO4 Interpret recent trends in marketing of services in various service sectors.

Course (Paper) Name and No.: E-Commerce & Digital Marketing

CO1 Define E-Commerce, its significance, innovative uses of E-Commerce, trends in e-commerce in various sectors and M-Commerce & its trends.

CO2 Application of E-commerce in developing competitive advantage for business and Build a website.

CO3 Interpret the importance of security, privacy, ethical issues and avenues related to E-Commerce.

CO4 Perceive the building blocks that constitute digital marketing and the tools, techniques, knowledge to develop cohesive digital marketing strategies.

Course (Paper) Name and No.: Sales & Distribution Management

CO1 Define knowledge about different components of sales and distribution management and what are the roles and responsibilities of a sales manager.

CO2 Interpret market analysis, sales forecasting approaches and selling concepts to focus on decision making aspects and implementation of decisions in sales and distribution management.

CO3 Design and Implement Distribution Channel Strategy.

CO4 Evaluate sales performance by using different performance evaluation techniques also perceive ethics and trends in sales and distribution management.

Course (Paper) Name and No.: Customer Relationship Management

CO1   Explain CRM goals and identify milestones in relationship management.

CO2   Analyze the companies which focuses on relationships with customers by using techniques of marketing initiatives, customer service and data management.

CO3   List the shift from short term customer transactions to a long-term relationship model.

CO4   Formulate best CRM strategies and practices.

Course (Paper) Name and No.: Finance for HR Professionals & Compensation Management

CO1   Describe the basic compensation concepts and the context of compensation practice.

CO2   Identify the internal and external environmental factors that have an impact on the pay structure of an organization

CO3   Illustrate different ways to strengthen the pay-for-performance link.

CO4   Design a pay structure or salary structure for employees working in the Company.

Course (Paper) Name and No.: Strategic Human Resource Management & HR Policies

CO1   Explain Human Resource Management with a strategic perspective.

CO2   Summarize HRM function and relate with corporate strategy in order to understand HR as strategic resource.

CO3   Assess strategic human resource Management and it's correlation with organizational performance

CO4   Apply theories and concepts relevant to strategic human resource management and utilize it for contemporary organization.

Course (Paper) Name and No.: Performance Management & Career Planning

CO1 Define the different facets of performance management of an enterprise.

CO2 Explain the features, components and evolution of performance management and its best practices.

CO3 Apply the performance management process like performance planning, benchmarking, managing and performance appraisal.

CO4 Determine the benefits and limitations of career planning and accordingly plan their career.

Course (Paper) Name and No.: Industrial Relations

CO1 Explain the concept of industrial relation.

CO2 Evaluate the essential concept of industrial relation at organization level and assess industrial dispute and various methods to prevent it.

CO3 Analyze how trade union are helpful in effective communication between workers and management through collaborative bargaining

CO4 Define history & provision of various legislation related to industrial relation in India

Course (Paper) Name and No.: Logistics & Supply Chain Management

CO1 Explain various technical concepts used in logistics and supply chain management.

CO2 How various warehousing management systems and transportation can be practiced in various industries?

CO3 To apply various techniques of inventory management and their practical situations.

CO4 Discover recent trends in logistics and supply chain management.

Course (Paper) Name and No.: Corporate Communication & Public Relations

CO1 Explain various technical concepts used in logistics and supply chain management.

CO2 How various warehousing management systems and transportation can be practiced in various industries?

CO3 To apply various techniques of inventory management and their practical situations.

CO4 Discover recent trends in logistics and supply chain management.

Semester VI

Course (Paper) Name and No.: Innovative Financial Services

CO1   Explain traditional as well as modern financial services based on fee based and fund based services.

CO2   Select the various intermediaries between the industry and the investors and explain the process of securitization.

CO3   Classify the facility available in the financial market regarding leasing, hire purchase, housing finance etc.

CO4   Summarize the financial products available in the market related to consumer durable & plastic money

Course (Paper) Name and No.: Project Management

CO1   Apply project management practices to the launch of new programs, products and services

CO2   Provide outline of planning and controlling activities to effectively produce and deliver goods and services.

CO3   Analyze appropriate business strategies and practices.

CO4   Evaluate knowledge about capital budgeting, capital structure and asset valuation.

Course (Paper) Name and No.: Strategic Financial Management

CO1   Illustrate basic concepts of financial management with regards to dividend policy and advanced capital budgeting

CO2   Examine theories and techniques to make better decisions

CO3   Demonstrate the knowledge and skills in relation to investment, financing and dividend policy decisions

CO4   Discuss corporate governance and financial management in banking sector

Course (Paper) Name and No.: Indirect Taxes

CO1   Demonstrate the basic knowledge of definitions and concepts GST law

CO2   Examine implication of provision GST law

CO3   Summarize the procedures involved from registration till return filing

CO4   Assess computation of tax liability

Course (Paper) Name and No.: Brand Management

CO1   Define meaning and significance of brand management, and how to build, sustain and grow brands.

CO2   Choose and implement various brand management programmes.

CO3   Assess various sources of brand equity.

CO4   Design Brand by using various Brand Elements.

Course (Paper) Name and No.: Retail Management

CO1   Interpret Organised Retail Sector and comprehend the ways retailers use technology to support the retail business.

CO2   Make use of various retail strategies related to the retail sector to achieve competitive advantage.

CO3   Appraise Merchandise Management and decide on the pricing of the products to attract the customers.

CO4   Develop a retail outlet.

CO5   Learners will be able to understand retail management terminology

Course (Paper) Name and No.: International Marketing

CO1   Outline strategies for entering into the international market.

CO2   Analyze environmental variables that influence international marketing and conduct research to enter a new international market.

CO3   Make use of strategies and tactics that can lead to successful international marketing.

CO4   Formulate a comprehensive International Marketing Plan.

Course (Paper) Name and No.: Media Planning & Management

CO1   Explain different features, impact and role of media in marketing.

CO2   Identify different budgeting techniques used, buying processes and tactics, and scheduling of media.

CO3   Gather knowledge of underlying criteria for evaluating the advantages and failure in data sources, media research, media mix and media strategies.

CO4   Develop a sense of judgment when evaluating media with the help of different media measurement metrics and media buys.

Course (Paper) Name and No.: HRM in Global Perspective

CO1   Explain the key term, theories and demonstrate it in field of IHRM

CO2   Define the basic concepts of Expatriates and Repatriates and relate it with challenges faced by Expatriates and Repatriates

CO3   Analyse the global cross culture and workforce management and relate it with reference to Human Resource Management.

CO4   Evaluate HRM trend and assess its Challenges

Course (Paper) Name and No.: Organisational Development

CO1   Interpret the basics of Organizational Development & role of OD practitioner.

CO2   Evaluate the implementation of OD interventions and judge their usefulness against other change tools and techniques.

CO3   Formulate an approach for organization development in response to appropriate organizational diagnosis, business imperatives and internal and external contextual forces.

CO4   Describe the data and explains the effectiveness of OD interventions;

Course (Paper) Name and No.: HRM in Service Sector Management

CO1   Define the concept and growing importance of HRM in the service sector.

CO2   Illustrate the ways of managing human resources in the service sector.

CO3   Adapt to the trending issues and challenges of HR in various service sectors.

CO4   Analyse the significance of the human element in creating customer satisfaction through service quality.

Course (Paper) Name and No.: Indian Ethos in Management

CO1   Adapt values and practice of IE in management

CO2   Demonstrate correlation between traditional and modern management system

CO3   Analyze the stress management techniques and discover its wide spectrum.

CO4   Explain concept and importance of learning and relate to system of India

Course (Paper) Name and No.: Operation Research

CO1   Define and formulate linear programming problems and appreciate their limitations

CO2   Interpret and solve complex problems by minimizing cost

CO3   Develop mathematical skills to analyze and solve networking models arising from a wide range of applications.

CO4   Identify parameters that will influence the optimal solution.

Class: M. Com. I

Semester I

Course (Paper) Name and No.: Business Ethics and Corporate Social Responsibility

CO1   Summarise Concept of Business Ethics, Indian Ethos, Various Approaches to Business Ethics and Gandhian Approach in Management.

CO2   Infer Ethical Practices followed by business firms, concept and Regulatory framework of corporate Governance.

CO3   Analyse concept of CSR, CSR activities performed by Indian Corporation, Models and Prestigious Awards for CSR.

CO4   Evaluate CSR towards stakeholders, Designing CSR policy, Global Recognition of CSR.

Course (Paper) Name and No.: Strategic Management

CO1   extend their knowledge on the various levels of strategies and its functions in business

CO2   distinguish the various strategic analysis and selecting the best alternatives for implementation

CO3   develop an understanding on Corporate Restructuring Strategies, Strategic Alliance, Public Private Participation and IT driven strategies

CO4   determine the importance of BPO & KPO in India, Business Process Reengineering and Disaster Management

Course (Paper) Name and No.: Cost and Management Accounting

CO1   Solve the problems based on Cost Accounting Standard.

CO2   Calculating the profitability of business using marginal costing techniques

CO3   Assessing the decision to be made under different alternatives under marginal costing

CO4   Gathering importance of costing techniques and methodology

Semester II

Course (Paper) Name and No.: Research Methodology for Business

CO1   interpret the importance of research, research design, hypothesis and sampling

CO2   apply the research process in collecting primary and secondary data

CO3   perceive the different tools and techniques in data analysis, data interpretation and hypothesis testing

CO4   develop an understanding on the different styles of report writing and modern practices in research

Course (Paper) Name and No.: E-Commerce

CO1   Outline the evolution of E-commerce, Models of E-commerce.

CO2   Extend their knowledge on World wide Web and E-enterprise.

CO3   Analyse E- Marketing and Electronic Payment System.

CO4   Evaluate Legal and Regulatory Environment and security Issues of E-Commerce.

Course (Paper) Name and No.: Corporate Finance

CO1   Explain the Scope and objectives of Financial Management.

CO2   Calculating the Present Value, Annuity, Techniques of Discounting, Techniques of Compounding, Bond Valuation and YTM

CO3   Examine Application of Capital Budgeting.

CO4   Solving the problems on Cost of Capital, Capital Structure Decisions and Business Risk and Financial Risk

Class: M. Com. II

Semester III

Course (Paper) Name and No.: Advanced Financial Accountancy

CO1   Learners are able to develop the concept of foreign currency conversion.

CO2   Learners are able to develop the concept of final accounts and statutory requirements of Banking companies.

CO3   Learners are able to develop the concept of final accounts and statutory requirements of insurance companies.

CO4   Learners are able to develop the concept of final accounts and statutory requirements of co-operative Societies.

Course (Paper) Name and No.: Direct Tax

CO1   Learners have precise understanding of all basic concepts of Direct Tax.

CO2   Learners are able to differentiate between Income Taxable & Exempt Income along with the determination of Residential Status of Assesse.

CO3   Learners will be able to segregate the Income into the various Heads of Income and compute the tax liability according to the applicable provisions.

CO4   Learners become aware of the various deductions available to Assesse from the Gross Total Income .

CO5   Learners will calculate the Tax liability of Individuals , Firms & Company.

CO6   Learners understand the procedure for filing of Income Tax Returns

Semester IV

Course (Paper) Name and No.: Corporate Financial Accounting

CO1   Learners are able to develop the concept of corporate financial reporting.

CO2   Learners are able develop the concept of International Financial Reporting Standard.

CO3   Learners are able to develop the concept of valuation of business for amalgamation and merger.

CO4   Learners are able to develop the concept consolidated financial statement

Course (Paper) Name and No.: Indirect Tax (G.S.T)

CO1   Learners will get precise understanding of the definitions, concepts and title under G.S.T.

CO2   Learners become aware of the rules & procedures for registration under G.S.T.

CO3   Learners are able to compute the Tax liability & place of collection of Tax under Integrated G.S.T. Act 2017.

CO4   Learners are able to differentiate between origin & movement of goods & services under the Integrated G.S.T Act 2017.

CO5   Learners learn the procedure for Challan generation , time & amount of tax along with the provisions for T.D.S and T.C.S.

Course (Paper) Name and No.: Advanced Cost Accounting

CO1   Learners are able to develop the concept of Process Costing.

CO2   Learners are able to develop the concept of Cost allocation and Activity Based Costing system.

CO3   Learners are able to develop the concept of Responsibility Accounting.

CO4   Learners are able to develop the concept of Strategic Cost Management.

Course (Paper) Name and No.: Financial Management

CO1   Learners are able to develop the concept of types of financing.

CO2   Learners are able to develop the concept of Investment decisions and capital budgeting.

CO3   Learners are able to develop the concept of Working Capital Management.

CO4   Learners are able to develop the concept Financial Planning.

CO5   Learners are able to develop the concept Financial Policy and strategic management

Class: M. Com. I (Business Analytics)

Semester I

Course (Paper) Name and No.: Introduction to Business Analytics & Data Science

CO1   Describe the basics of business analysis and Data Science

CO2   Interpret data management and handling and Data Science Project Life Cycle

CO3   Discuss the machine learning concept

CO4   Evaluate the data mining techniques

Course (Paper) Name and No.: Business Intelligence

CO1   Identify the decision-making capabilities in the business intelligence architecture and implement activities.

CO2   Categorize and assess consumer behavior and its influence on firm and household decisions.

CO3   Evaluate the moral challenges involving best practices of ethical behavior.

CO4   Develop the data analysis framework for optimal performance.

Course (Paper) Name and No.: Statistics & Econometrics

CO1   Discuss the various concepts of Econometrics

CO2   Calculate probability distribution, Continuous Random Variables & Probability Distribution, Normal Distribution.

CO3   Analyze the variances by using ANOVA.

CO4   Critically evaluate uses (and misuses) of statistics.

Course (Paper) Name and No.: R Programming

CO1   Define basics of statistical computing and data analysis

CO2   Apply R programming in statistics

CO3   Analyze use of R analytical programming

CO4   Design and write efficient programs using R to perform routine and specialized data management and analysis tasks

Course (Paper) Name and No.: Research Methodology

CO1   Describe various aspects of research methodology

CO2   Design the research in research methodology in accounting and finance

CO3   Analyze the data collected & process for drawing conclusion

CO4   Apply various statistical tools in research

CO5   Develop research report writing skill

Course (Paper) Name and No.: Strategic Cost Accounting

CO1   Apply cost accounting methods to evaluate and project business performance.

CO2   Classify the cost of product, apportionment of cost of product.

CO3   Calculate total cost of the product for fixing selling price.

CO4   Determine the target cost.

Semester II

Course (Paper) Name and No.: Business Application of Block Chain Technologies

CO1 To describe Blockchain technology and its significance.

CO2 To explain cryptography and Blockchain technology networks.

CO3 To identify Business challenges in Blockchain technology.

CO4 To evaluate the domain specific Blockchain technology business cases.

Course (Paper) Name and No.: Business Modelling

CO1 Describe the basic of VB and Excel

CO2 Explain the Power BI and its use

CO3 Analyze the Power BI techniques

CO4 Design an application of spreadsheet in the modelling

Course (Paper) Name and No.: Quantitative techniques for Managers

CO1 Evaluate different types of decision-making environments and the appropriate decision-making approaches and tools

CO2 Construct linear programming problem and to find optimal CO2: solution by graphical simplex method.

CO3 Solve Transportation Models and Assignment Models also to solve game theory problems by understanding pure and mix strategies.

CO4 Describe optimal sequence of difference jobs on different machines and queuing theory concepts and CPM, PERT to reduce cost and time.

Course (Paper) Name and No.: Python Programming

CO1   Explain significance of Python language for developers.

CO2   Make use of loops, functions, lists, tuples, and Range in Python programs.

CO3   Analyze the different ways of data analysis with the help of Python application.

Course (Paper) Name and No.: Financial Reporting

CO1   Describe and understand the International Financial Reporting standards and their application.

CO2   Prepare and interpret the financial statements according to the Ind AS.

CO3   Develop understanding the concept of GAAP, IFRS and Ind AS.

CO4   Distinguish the scheme of Merger, demerger and Reverse Acquisition.

Faculty of Science

Department of Chemistry

Programme Specific Outcomes

PSO1 The students will have sound understanding of fundamental and application based principles and theories in Physical, Inorganic, Organic and Analytical Chemistry

PSO2 Students will learn various techniques to perform scientific experiments as well as accurately record and analyse the results of such experiments

PSO3 Student will learn the usage of analytical instruments, select, and apply appropriate techniques and resources for the analysis

PSO4 Extensive laboratory and classroom work will skill the students with in problem solving, critical thinking and analytical reasoning as applied to scientific problems

PSO5 Students will be acquainted with new areas in both chemistry and allied fields of science and technology

PSO6 Students will understand the applications and impact of the chemistry in societal, and environmental contexts, and demonstrate it's knowledge and need for sustainable development

PSO7 Students will learn to apply ethical practices such as limited and safe use of hazardous chemicals, responsibility toward environmental and health safety

PSO8 Students will be able to work in team and thus get prepared as a perfect professional chemist with respect to knowledge, responsibility and teamwork

Department of Chemistry (Post Graduate Diploma in Analytical Instrumentation)

Programme Specific Outcome

PSO1   Prepare solutions of various strength, reagents used for Instrumental analysis.

PSO2   Analyze real sample on sophisticated analytical instruments using SOPs.

PSO3   Demonstrate handling of troubleshooting abilities on the instruments during actual analysis.

PSO4   Interpret chromatographic and spectroscopic analytical data.

Department of Microbiology

Programme Specific Outcome

PSO1 The program is aimed at equipping the students with basic knowledge in various branches of Microbiology such as Microbial Genetics, Molecular Biology, Virology, Medical Microbiology, Immunology, Microbial Biochemistry and Industrial Microbiology. Additionally, it also makes students aware of interdisciplinary sciences such as Bioinformatics and Bioinstrumentation

PSO2 At the end, student will have employability in food industry, pharmaceutical industry, Agricultural industry and fishery. Students will work as microbiologist in QA and production departments

PSO3 Students will develop basic understanding of the subject and will have developed life skills to solve environmental and hygiene related problems

Department of Biotechnology

Programme Specific Outcome

PSO1 Students will learn the basic concepts of Chemistry and analytical chemistry applied in Biological Sciences.

PSO2 An education in Cell biology, Biochemistry, Animal and plant physiology, human genetics and Immunology will impart knowledge to the students about cellular structure, biomolecules, metabolic pathways, its regulation along with defense mechanism and physiological processes in plants and animals.

PSO3 Students will also learn the concepts of biodiversity, ecology environment and its conservation.

PSO4 Students will gain basic information of microbial cultures, sterilization methods and enzyme production. They will be taught bio-safety guidelines and good laboratory practices.

PSO5 Introduction of recent topics like Drug delivery, Marine biotechnology, Bioinformatics will impart knowledge of mechanism of drug delivery, drug designing and applications of marine organisms as food, neutraceutical and cosmetics etc.

PSO6 Students will understand the principles and the applications of molecular biology and genetic engineering methods with an emphasis on the application of recombinant DNA technology to animals, plants and microbial organisms.

PSO7 The course will give the knowledge of Bioethics, IPR, entrepreneurship, scientific writing Communication, and management skills to the students.

PSO8 Students will get hands on training of techniques used in Cell Biology, Biochemistry, Microbiology, Immunology, Molecular Biology and Genetic Engineering.

Department of Computer Science

Programme Specific Outcome

PSO1   Challenging and varied subjects aligned with the current trend with the introduction of Machine Intelligence specific subjects.

PSO2   Understand Data Management Skills.

PSO3   Learn the skills of Image processing.

PSO4   Introduction of the physical world through Architecting of IoT and Wireless Sensor Networks and Mobile Communication.

PSO5   Security domain is also evolved by the introduction of Ethical Hacking, Cyber Forensic and Information and Network Security.

PSO6   Get the hands on experience Linux Server Administration and Web Services topics are included.

Department of Information Technology

Programme Specific Outcome

PSO1   Learners are able to work effectively in IT industries in field of project management.

PSO2   Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks.
Able to understand building blocks of Internet of Things and characteristics.

PSO3   Learners are able to configure different types of servers on Linux Platform.

PSO4   Learners are able to create application projects using different technologies such as
enterprise java and .Net.

PSO5   Learners are able to build and enhance business intelligence capabilities by adapting
the appropriate technology and software solutions.

Department of Computer Science

M.Sc. in Data Analytics

Programme Specific Outcome

PSO1 Apply IT in the field of Data Science, AI, Networking, Security and Cloud Computing.

PSO2 Design solutions for complex IT problems.

PSO3 Develop research, investigation skills and achieve professional competency in the field of I.T.

Department of Zoology

Programme Specific Outcomes

PSO1   Gain the comprehensive knowledge and understanding of major concepts, theoretical principles and experimental findings in Zoology and its different subfields.

PSO2   Learn a wide range of approaches, from genetics to molecular and cellular biology, as well as physiological processes and anatomy, and diseases

PSO3   Spread awareness about wildlife and ecology as well as the environment and its conservation in the society

PSO4   Gain knowledge of Agro based Small Scale industries like sericulture, aquaculture and vermicomposting.

PSO5   Develop the interest and employability, program includes learning experiences which offer opportunities for higher studies and research at reputed laboratories

PSO6   Understand the concept of research and its type along with basic knowledge of qualitative research techniques, data collection and process of scientific documentation.

PSO7   Analyze the ethical aspects of research and evaluate the different methods of scientific writing and reporting by appropriate documentations and presentations.

Programme- M.Sc.

Department of Chemistry

Programme Outcome

PSO1   Knowledge: develop knowledge, understanding and expertise in their chosen field of chemical science.

PO2   Green Approach: awareness about usage of environmental methodologies

PO3   Analytical Approach: develop critical thinking and problem solving ability with accuracy and valid reasoning

PO4   Effective communication: develop ability to analyse, interpret and communicate effectively the ideas, knowledge and information orally, written, electronically and through media

PO5   Social responsibility: understanding of socially relevant aspects of the subjects, application of knowledge for sustainable development, awareness about environmental and health safety

PO6   Ethics: understand the different values and moral dimensions associated with knowledge, decisions and related responsibility

PO7   Personality development: build the personality of an individual as a responsible citizen, scientist, academician, industrialist, team leader, team member, social personality

Programme – M.Sc. II Analytical Chemistry

Department of Chemistry

Programme Specific Outcome:

PSO1 Students will have a strong foundation in the fundamentals and application of various theoretical concepts in Analytical, Inorganic, Organic and Physical Chemistry

PSO2 Students will learn advanced characterization techniques by gaining the knowledge of spectroscopy, chromatography, electroanalytical methods, hyphenated techniques and chemistry of synthetic and natural products

PSO3 Student will learn the usage of analytical instruments, select, and apply appropriate techniques and resources for the analysis

PSO4 Students will demonstrate their laboratory skills in qualitative, quantitative, separation and advanced instrumental methods

PSO5 Students will identify the need of IPR by integrating the knowledge of total quality management, GLP and GMP

PSO6 Research ability will be developed as the students get skilled to problem solving, critical thinking and analytical reasoning as applied to scientific problems

PSO7 The ability to communicate scientific information in written, oral and electronic formats will be developed among students

PSO8 Students will be able to learn application of various softwares for interpretation and representation of results

Programme – M.Sc. II Organic Chemistry

Department of Chemistry

Programme Specific Outcome

PSO1   PSO1: Develop analytical thinking and apply the same for understanding principles, proposing mechanism and logical conclusions.

PSO2   PSO2: Comprehensive understanding of the interdisciplinary nature of Chemistry and emerging trends in Chemistry.

PSO3   PSO3: Enormous employment opportunities at Research and Development as well as synthetic division of chemical, pharmaceutical, dyestuff and food industries.

PSO4   PSO4: Competency in design and planning of synthesis and carry out with Good Laboratory Practices.

PSO5   PSO5: Access, search and use of chemical literature and acquiring necessary skills to succeed in research and advance studies.

PSO6   PSO6: Research opportunities to pursue Ph.D. programme.

PSO7   PSO7: Competency in handling instruments and interpretation of spectral data for structure determination of organic compounds

Department of Microbiology

Programme Specific Outcome:

PSO1   The program is aimed at equipping the students with basic knowledge in various branches of Microbiology such as Microbial Genetics, Molecular Biology, Virology, Medical Microbiology, Immunology, Microbial Biochemistry, Environmental Microbiology, Advances in Biotechnology and Industrial (food, pharmaceutical) Microbiology. Additionally, it also makes students aware of interdisciplinary sciences such as Bioinformatics and Bioinstrumentation

PSO2   At the end, student will have employability in food industry, pharmaceutical industry, Agricultural industry and fishery. Students will work as microbiologist in Research, QC, QA and production departments

PSO3   Students will develop basic understanding of the subject and will have developed life skills to solve environmental and hygiene related problems

Department of Biotechnology

Programme Outcome

PSO1   Courses will provide integrated knowledge of biochemistry, cell biology and immunology with details of protein folding, protein targeting, and regulation of metabolic pathways, bio-membranes, cell signaling, vaccinology, immunological techniques and Animal Models.

PSO2   Students will develop understanding of history, theoretical basis, of latest technologies in area of biotechnology.

PSO3   On completion of course, students should be able to gain basic skills in plant and animal biotechnology.

PSO4   Students will get conceptual exposure of computational, biostatical and bioinformatics tools.

PSO5   Course will provide integrated knowledge of operations of various fermenters and important microbial/enzymatic industrial processes in food and fuel industry. It will also provide knowledge on intellectual property rights and their implications in biological research and product development

PSO6   Courses will provide integrated knowledge and broad perspectives of various pandemics diseases and emerging pathogens. Students will be familiar with the basic concepts and significance of Biologics/Biosimilar, principles and the applications of enzyme technology with enzyme purification techniques.

PSO7   Students will develop understanding about Health hazards of pollution and waste, solid waste management, biodiversity concepts and data management and environmental monitoring.

PSO8   Students will be able to understand the basic science behind the properties of nanomaterials synthesis and applications of nanomaterials.

PSO9   Students will get knowledge of the emerging fields of OMICS and Systems Biology, biological systems as a whole and how parts of systems interact with each other and their applications for screening, testing and treatment of human diseases.

PSO10   Students will have a firm foundation in Drug Discovery and Clinical Studies along with detail information of Clinical Trial Design and Indian Regulations, Pharmacovigilance and Clinical Data Science.

PSO11   Students will develop skills for the processing and analysis of scientific data along with knowledge of techniques used Food Technology - Nutraceuticals

Department of Computer Science

Programme Specific Outcome

PSO1   Learners will be able to communicate computer science concepts, designs, and solutions effectively and professionally.

PSO2   Able to Identify, analyse and synthesize scholarly literature relating to the field of computer science.

PSO3   Gain knowledge of computing to produce effective designs and solutions for specific problems.

PSO4   Promotes research oriented activity through different subjects

Department of Information Technology

Programme Specific Outcome

PSO1   Enter new problem areas that require an analytic and innovative approach.

PSO2   Get some development experience within a specific field of Information Technology, through project work.

PSO3   Get the ability to apply knowledge of Information Technology to real-world issues.

PSO4   Apply advanced theoretical and practical methods gained from various courses.

PSO5   Develop and renew Information Technology competence.

Faculty of Science

Class: F.Y.B. Sc. Chemistry
Semester I

Course (Paper) Name and No.: Chemistry Paper-I, Sem-I Code: USC1CH1

CO1 Recall thermodynamics terms, the first law of thermodynamics and terms like normality, molarity.

CO2 Solve the Numerical problems based on the Concentration of solutions

CO3 Classify the elements according to electronic configuration and explain details of periodic trends and atomic structure.

CO4 Explain the name, bonding and structure of organic compounds, bond fission, types of organic reactions and various electronic effects

Course (Paper) Name and No.: Chemistry Paper-II, Sem-I Code: USC1CH2

CO1 Explain the rules of integration, derivatives.

CO2 Outline the metallic and non-metallic nature, oxidation states, electronegativity, Anomalous behaviour and allotropy of main group elements.

CO3 Explain the reactivity of group 1 and group 2 elements and the effects of Oxides of carbon, sulfur and nitrogen on the environment.

CO4 Define surface tension, Viscosity, Refractive index of Liquid, Order of reaction.

Course (Paper) Name and No.: Chemistry Practical's Code: USC1CHP

CO1 Find exact concentration of the solutions and enthalpy of dissolution.

CO2 Apply chemical kinetics law to calculate the rate constant of the reaction.

CO3 Find the normality of acids and bases and purity of samples gravimetrically.

CO4 Apply Thin Layer Chromatographic (TLC), Distillation, Recrystallization, Sublimation methods for separation of a mixture.

Semester II

Course (Paper) Name and No.: Chemistry Paper-I, Sem-II Code: USC2CH1

CO1   Explain deviations from ideal gas laws , Joule-Thomson effect and nanotechnology with the experimental setup.

CO2   Define the equilibrium constant, Le-Chatelier Principle and the second law of thermodynamics.

CO3   Discuss basic terms of co-ordination chemistry, qualitative analysis and acid-base theories

CO4   Identify the products of reactions of alkanes, alkenes and alkynes

Course (Paper) Name and No.: Chemistry Paper-II, Sem-II Code: USC2CH2

CO1   Classify between aromatic, anti-aromatic, and non-aromatic compounds.

CO2   Write the mechanism of the Electrophilic aromatic substitution reaction.

CO3   Identify the shapes of molecules with and without lone pair of electrons and the oxidation number of elements to balance the redox equations.

CO4   Explain Law of crystallography, Different types of interaction of electromagnetic radiation with matter, Degree of ionization and Henderson equation for acidic and basic buffers.

Course (Paper) Name and No.: Chemistry Practical's Code: USC2CHP

CO1   Apply chemical kinetics law to calculate the rate constant of reaction.

CO2   Make use of colorimeter and pH meter.

CO3   Identify cations and anions from the given mixture of compounds and   percentage of metal present in the sample by titration.

CO4   Identify organic compound containing C,H (O) N, S, X elements.

Course (Paper) Name and No.: Discrete Mathematics & Paper II

CO1   Student will be able to analyse the properties of functions, relations and recurrence relations.

CO2   Student will be able to solve the recurrence relations.

CO3   Student will be able to make use of the preliminary counting to solve the problems.

CO4   Student will be able to apply the advanced counting methods to solve the problems.

Class: S.Y.B. Sc. Chemistry

Semester III

Course (Paper) Name and No.: General Chemistry - I

CO1   Illustrate the equation of Gibbs free energy, Chemical potential, Transport number and degree of Ionization.

CO2   Explain different types of ionic crystals and hybridizations.

CO3   Construct the molecular orbital diagram of homonuclear diatomic molecules.

CO4   Compare the different properties, reactions and reactivity of alkyl/aryl/halides/ organometallic compounds/alcohol, Phenol and epoxide.

Course (Paper) Name and No.: General Chemistry-II

CO1   Explain complex chemical reactions, Collision and activated complex theory, effect of temperature on Arrhenius equation, thermodynamics of ideal solutions.

CO2   Summarize the chemistry of Boron, Silicon and Germanium compounds.

CO3   Recall the facts and basic concepts like a distillation of solution, Haber process and role of active methylene compounds.

CO4   Construct the names and methods of preparation of carbonyl group compounds.

Course (Paper) Name and No.: Analytical chemistry III

CO1   Classify analytical methods and errors in analysis.

CO2   Outline the methods of calibration of tools used and preparations for titrimetric analysis.

CO3   Explain the principles of titrimetric analysis and UV-Visible spectroscopy.

CO4   Apply statistical methods to treat the analytical data.

Course (Paper) Name and No.: Practical

CO1   Determination of various constants such as solubility products, dissociation constant, rate constant based on physical principles.

CO2   Identify the ions in inorganic salts.

CO3   Demonstrate the effectiveness of crystallization as a separation technique.

CO4   Infer the obtained results effectively presentation.

Semester IV

Course (Paper) Name and No.: General Chemistry I

CO1   Explain thermodynamics properties, equilibrium constant and different types of electrode.

CO2   Illustrate Gibb's Phase rule, Phase diagram of one and two component system with examples.

CO3   List the properties of transition metal compounds and different types of isomers in coordination compounds.

CO4   Compare properties, acidity, preparations, reactions, the nucleophilicity of acyl substituents of carboxylic acid and stereochemistry.

Course (Paper) Name and No.: General Chemistry-II

CO1   Explain the law of crystallography, types of crystal, Interplanar distance in the lattice, types of catalysis, Mechanisms and Kinetics of catalyst.

CO2   Explain the concept of hydration of cations and anions with respect to the effect of charge and radius.

CO3   Identify the hazardous effect of air pollutants like sulphuric acid, nitric acid and phosphoric acid

CO8   Outline the synthesis, reaction of amines and heterocyclic compounds like Furan, Pyrrole, Thiophene.

Course (Paper) Name and No.: Analytical chemistry III

CO1   Classify various separation methods based on their principles.

CO2   Discuss the principles, construction and working of instrumental techniques based on the electrochemical properties of the analytes.

CO3   Describe chemical methods of analysis and their suitable parameters.

CO4   Apply the analytical methods to determine the physicochemical of environmental analysis.

Course (Paper) Name and No.: Practical

CO1   Find emf, amount of acid, acid strength potentiometrically.

CO2   Compare the strength of HCl and H_2SO_4 by kinetically.

CO3   Calculate the amount from the given sample conductometrically and gravimetrically.

CO4   Analyze qualitatively bifunctional organic compounds.

Class: T.Y.B. Sc. Chemistry

Semester V

Course (Paper) Name and No.: Physical Chemistry

CO1   Select the type of spectrum such as rotational, vibrational, Raman for given molecules using molecular spectroscopy, and make use of data to solves different numericals.

CO2   Relates the equations of mole fraction and molecular weight of different colligative properties, distinguishing with examples of collision theory and activated complex theory.

CO3   Explain terms involved in nuclear chemistry and outline detection and measurement of radioactivity using G.M. Counter and Scintillation counter method.

CO4   Summarize colloidal systems in various class and use to apply various catalyst in reactions

Practical's

CO1   Interpret the order of chemical reaction by calculation and graphically and determine molecular weight of polymer using viscosity measurement.

CO2   Demonstrate practical handling skills based on instruments such as conductometry, colorimetry, potentiometry.

Course (Paper) Name and No.: Inorganic Chemistry

CO1   Explain concept of Superconductivity, types of super conductors and its applications, imperfections in solids and their effect on properties chemistry of inner transition elements, extraction and applications, chemistry of non-aqueous solvents

CO2   Compare chemistry of Group 16 elements and Group 17 elements.

CO3   Assign the point group for given molecules using basic concepts of molecular symmetry and construct molecular orbital diagrams for heteronuclear diatomic molecules and polyatomic species.

CO4   Determine packing density of different types of cubic unit cells

Practical's

CO1   Develop the practical skills for preparation of different inorganic metal complexes

CO2   Examine the percentage purity of the inorganic compounds qualitatively and quantitively and impurity identification.

Course (Paper) Name and No.: Organic Chemistry

CO1   Explain the fate of the excited molecule in photochemistry and systematic study of photochemical reactions.

CO2   Relate the reactivity and reactions of organometallic, heterocyclic compounds and their synthesis

CO3   Apply the concepts in writing and predicting the mechanism of organic reactions.

CO4   Examine the spectral data of UV-Visible, IR, NMR and Mass spectroscopy for structure elucidation of organic compounds.

Practical's

CO1   Identify chemical type of components present in binary mixture of solid-solid mixture and unknown organic compound by micro-scale technique.

CO2   Apply skills in the separation and qualitative analysis of organic compounds of solid-solid mixtures by microscale technique.

Course (Paper) Name and No.: Analytical Chemistry

CO1   Define the quality concepts, chemical standards certified reference materials, various grades of chemicals and sampling methods

CO2   Contrast solvent and solid phase extraction methods

CO3   Discuss the principles and instrumentation of different spectroscopic methods

CO4   Evaluate the various concentrations based on weight and volume and their interconversions.

Practical's

CO1   Demonstrate the analytical skills in the quantitative analysis of variety of samples

CO2   Interpret the results of a chemical analysis and effectively communicate in the form of written reports in laboratory journal

Course (Paper) Name and No.: Drugs

CO1   Define the routes of administration, methods of ingestion, tolerance, withdrawal and interactions of these drugs with other psychoactive and nonpsychoactive drugs.

CO2   Explain details about the pharmacodynamics agents used for the treatment of different diseases side effects and synthesis.

CO3   Classify the dyes based on applications and dyeing methods

CO4   Make use of Unit processes required for the synthesis of dyes intermediates

Practical's

CO1   Synthesis of simple drugs i.e asprin

CO2   Estimation of Ibuprofen.

CO3   The acid-neutralizing capacity of antacid

CO4   Project on cotton dyeing

Semester VI

Course (Paper) Name and No.: Physical Chemistry

CO1   Classify chemical and concentration cells with and without transferences

CO2   Summarize preparation methods and characterization techniques of nanomaterials.

CO3   Classify polymers in various class and determine the average molecular weight of polymers using various methods

CO4   Explain physical aspects of NMR spectroscopy in details and classify the systems using phase rules

Practical's

CO1   Determine molecular weight by Rast method and order of reaction by fractional change method and Explain the adsorption phenomenon and the validity of dsorption isotherm.

CO2   Demonstrate practical skills based on instruments such as conductometry, pH meter, potentiometry

Course (Paper) Name and No.: Inorganic Chemistry

CO1   Demonstrate the knowledge of organometallic chemistry, and metallurgy.

CO2   Explain the chemistry of Group 18 elements, preparation and structures of xenon compounds and biological importance of metal ions.

CO3   Construct molecular orbital diagram of different coordination compounds, Analyse the electronic spectra of complexes.

CO4   Measure Crystal field stabilization energy (CFSE) for octahedral complexes using basic concepts of Crystal Field Theory.

Practical's

CO1   Develop the practical skills for preparation of different inorganic metal complexes

CO2   Examine the percentage purity of the inorganic compounds qualitatively and quantitively and impurity identification.

Course (Paper) Name and No.: Organic Chemistry

CO1   Explain stereoselectivity, stereospecificity, mechanism and stereochemistry of substitution, elimination and addition and rearrangement reactions.

CO2   Classify polymers and its preparation, functional group transformation and selectivity of reagents and catalyst in organic synthesis.

CO3   Construct the structures of carbohydrates and its interconversion, describe the structures of proteins, nucleic acids and its components.

CO4   Interpret the analytical and chemical evidences for structure elucidation of natural products

Practical's

CO1   Demonstrate the separation of the liquid-liquid and solid-liquid mixtures by fractional distillation.

CO2   Plan organic synthesis with calculations, stoichiometry, aspects of synthesis and predictions of spectral data in IR and NMR of the reactant and product.

Course (Paper) Name and No.: Analytical Chemistry

CO1   Illustrate the principles of polarography and amperometric titration

CO2   Extend the theoretical principles to the range of applications of TGA, DTA and NAA

CO3   Classify the advanced chromatographic techniques based on mobile phases and stationary phases, modes of separation and their instrumental details and applications in industry

CO4   Apply the suitable analytical method for food and cosmetic analysis

Practical's

CO1   Explain the theory behind the separation of ions by ion exchange chromatography and analysis of commercial samples and waste water samples

CO2   Interpret the measured data after numerical or graphical treatment

Course (Paper) Name and No.: Drugs

CO1   Explain details about the chemotherapeutic agents used for the treatment of different diseases side effects and synthesis.

CO2   Explain drug discovery design and development and drug metabolism and application of nanoparticles in medicinal chemistry.

CO3   Classify the dyes based on Chemical Constitution and preparations

CO4   Explain the non-textile uses, Health and Environmental Hazards of the dyes

Practical's

CO1   Synthesize, Crystallization Physical constant, Apply the o-Methylation step to different phenols

CO2   Propose the acetylation method of aromatic amines

CO3   Examine monograph

CO4   Apply the TLC technique for the separation of the mixture of dyes

Class: F.Y.B. Sc. Microbiology

Semester I

Course (Paper) Name and No.: Fundamentals of Microbiology-I

CO1   Define types of bonds associated in chemical interactions

CO2   Explain the properties of macromolecules essential for life

CO3   Demonstrate the knowledge on the contribution of scientists in the field of microbiology

CO4   Distinguish between eukaryotic & prokaryotic cell structure and function

Course (Paper) Name and No.: Basic Techniques in Microbiology-II

CO1   Explain the basic techniques used in the microbiology

CO2   Classify the bacteria by using the conventional and modern techniques.

CO3   Examine the morphological characteristics of microorganisms

CO4   Define the various terms used in the field of Microbiology

Course (Paper) Name and No.: Practicals

CO1   Apply staining techniques used for the microscopic study of bacterial morphology and cell organelles of eukaryotic cells.

CO2   Analyze the macromolecules found in test samples

CO3   Demonstrate the effect of physicochemical agents onto the growth of various microorganisms

CO4   Demonstrate knowledge of microscope handling, Laboratory safety, inoculation techniques and media preparation

Semester II

Course (Paper) Name and No.: Basics of Microbiology II

CO1   Relate key characteristics/differences among protozoa, algae, fungi, slime molds and myxomycetes

CO2   Classify the viruses based on their general features.

CO3   Compare between turbidometry and nephelometry methods for cell density measurement

CO4   Calculate the generation time of bacteria using growth curve

Course (Paper) Name and No.: Exploring Microbiology

CO1   Recite general characteristics of eubacteria and archaebacteria

CO2   Describe the interaction among microbes and human health

CO3   Demonstrate the knowledge of microscopic technique for the study of world of microbes

CO4   Compare the normal microbial flora of human body

Course (Paper) Name and No.: Practicals

CO1   Compare the morphological characteristics of various fungi isolated from soil sample

CO2   Verify the Beers law by using colorimeter

CO3   Determine the microbial cell number by using Breed's count, Browns opacity tube and Hemocytometry

CO4   Detect virulence factor- Lecithinase, Coagulase & hemolysin activity of microorganism

Class: S.Y.B. Sc. Microbiology

Semester III

Course (Paper) Name and No.: I : Estimation of Biomolecules and Introduction to Bioenergetics and Biostatistics

CO1   Explain the method of extraction and estimation of biomolecules.

CO2   Apply concept of thermodynamics to bioenergetics.

CO3   Solve biostatistical problems related to measurement of central tendency and dispersion.

CO4   Determine concentration of solutions in terms of molarity, normality molality, osmolarity, mole fraction etc.

Course (Paper) Name and No.: II: Introduction to fermentation technology and Applied Microbiology

CO1   Compare primary and secondary screening methods.

CO2   Explain the parts of the fermenter and its type.

CO3   Apply standard microbiological techniques for the testing and preservation of milk /food.

CO4   Demonstrate the understanding of techniques used for wastewater management and treatment

Course (Paper) Name and No.: III: Introduction to Microbial Genetics and Molecular Biology

CO1   Compare the structure and biochemistry of DNA and RNA, nucleotides, and their types.

CO2   Explain the methods of DNA sequencing like Maxam & Gilbert and Sanger's method.

CO3   Categorize the different types of mutations which may occur in DNA and their repair mechanisms.

CO4   Enlist the basic concepts of steps involved in DNA replication and protein synthesis.

Course (Paper) Name and No.: Practicals

CO1   Estimate concentration of biomolecules using colorimetric methods.

CO2   Analyze food, milk, and water samples for their microbiological qualities.

CO3   Experiment with DNA for its estimation, separation, and visualization

CO4   Demonstrate skills for isolation for screening of antibiotic producer and organic acid producer

Semester IV

Course (Paper) Name and No.: I: Introduction to Metabolism and Enzymology

CO1   Explain the concepts of metabolism and metabolic pathways.

CO2   Develop kinetic model of enzyme Inhibition

CO3   Compare solute uptake mechanisms of bacteria

CO4   Illustrate preparation of vesicles for study of solute uptake

Course (Paper) Name and No.: II: Introduction to Medical Microbiology and immunology

CO1   Define various terms associated with Epidemiology.

CO2   Explain the importance of pathogenic bacteria in human disease concerning infections of the respiratory tract, gastrointestinal tract, skin, and nervous system.

CO3   Classify the types of immune systems, cells involved in the immune system.

CO4   Select the immunological and molecular techniques for disease diagnosis.

Course (Paper) Name and No.: III: Advances Analytical Techniques, Soft Skills and Applications of Microbiology

CO1   Define the basic terms involved in Bioinformatics.

CO2   Explain the importance of research work, research planning and interpretation of data.

CO3   Develop the understanding of principle, working and applications of separation and spectrophometric techniques of Centrifugation, Chromatography and Spectrophotometry.

CO4   Categorize the distinct types of Biosensors and Nanoparticles.

Course (Paper) Name and No.: Practicals

CO1 Experiment with enzyme for determination of Km, Vmax and, effect of pH and Temperature on enzyme activity.

CO2 Determine biochemical characteristics of bacteria

CO3 Demonstrate skills for separation techniques such as Paper chromatography, Thin layer chromatography, Column chromatography and Cell sizing.

CO4 Formulate a scientific report/Abstract

Class: T.Y.B. Sc. Microbiology

Semester V

Course (Paper) Name and No.: I : Microbial Genetics I

CO1   Explain the fundamental principles of Central dogma of life

CO2   Co –relate between prokaryotic and eukaryotic DNA replication, transcription, and translation

CO3   Compare the various gene exchange mechanisms found in microorganisms

CO4   Determine the role of mutagenic agents and their effects onto the growth of living cells

Course (Paper) Name and No.: II: Medical Microbiology & Immunology

CO1   Explain mode of transmission, diagnosis, prophylaxis and treatment of respiratory, gastrointestinal skin diseases and virulent factors of pathogen.

CO2   Describe the structure and function of immunoglobulins, cells and organs involved in formation of adaptive immune response.

CO3   Analyze the mechanism of antigen antibody reaction and its application in diagnosis of various infections.

CO4   Compare Koch postulates and molecular Koch postulates in identification of pathogen.

Course (Paper) Name and No.: III: Microbial Biochemistry I

CO1   Explain mechanism of generation of electrochemical energy and ATP synthesis

CO2   Demonstrate EMP, ED, HMP pathways and TCA cycle.

CO3   Differentiate between catabolism and anabolism of lipids

CO4   Deduct fermentation pathways

Course (Paper) Name and No.:IV: Bioprocess Technology Part-I

CO1   Explain the techniques of strain improvements in Industrial Microbiology.

CO2   Develop the design of bioreactors and media for fermentation under different conditions.

CO3   Select the procedures and techniques for the upstream and downstream process of fermentation.

CO4   Compare traditional industrial fermentation such as Beer, Wine, Vinegar, etc.

Course (Paper) Name and No.:V: Applied component Biotechnology

CO1   Apply knowledge to carry out biophysical techniques (electrophoresis, spectrophotometry) in biotechnology

CO2   Apply techniques for engineering biomolecules industrial and marine organisms for potential applications

CO3   Compare the mechanisms of generating transgenic animals

CO4   Create strategies to bioremediate the pollutants from soil

Course (Paper) Name and No.: Paper I and II (Practicals)

CO1   Develop experimental skill while performing fundamental molecular biology experiments

CO2   Apply ultraviolet rays for the induction of mutation in microbial cell

CO3   Identify the causative microorganism from different pathological samples using cultural and biochemical analysis

CO4   Interpret the presence of causative agent such as Candida albicans and Mycobacterium species in the patient's sample using microscopic technique

Course (Paper) Name and No.: Paper III and IV (Practicals)

CO1   Determine phosphatase activity

CO2   Differentiate between homo- and hetero-fermenters.

CO3   Determine sugar concentration by Cole's Ferricyanide method and Alcohol concentration by Dichromate method.

CO4   Demonstrate the knowledge of alcohol fermentation with respect to process, efficiency determination, sugar, and alcohol tolerance determination of yeast.

Course (Paper) Name and No.: Paper V (Practicals)

CO1   Explain the details on cultivation of mushroom

CO2   Apply techniques to explore marine microorganisms

CO3   Develop knowledge on the role of microorganisms in industrial and marine biotechnology

CO4   Formulation of biopesticide using *Bacillus thuringiensis*

Semester VI

Course (Paper) Name and No.: Microbial Genetics I

CO1   Explain basic tools and steps involved in r- DNA technology

CO2   Find In-Silico Analytical techniques used in Bioinformatics and Proteomics

CO3   Classify viruses based onto their general structure, genetic material, and life cycle

CO4   Explain the regulation of genes expression at molecular level

Course (Paper) Name and No.: II: Medical Microbiology & Immunology

CO1   Explain the structure and role of T & B cells in adaptive immune response.

CO2   Differentiate between modes of action of different chemotherapeutic agents in disease treatment.

CO3   Evaluate the mode of transmission, pathogenesis and treatment of central nervous system and sexually transmitted diseases.

CO4   Describe the role of vaccines in disease prevention, complement system in immune response.

Course (Paper) Name and No.: III: Microbial Biochemistry II

CO1   Describe general reactions of amino acid metabolism and amino acid fermentation

CO2   Summarize factors affecting catalytic efficiency of enzymes.

CO3   Analyze the regulatory mechanism of a pathway

CO4   Judge the assimilatory and dissimilatory pathways of inorganic metabolism

Course (Paper) Name and No.:IV: Bioprocess Technology Part II

CO1   Explain the industrial production of bioinsecticides, biofertilizers, and biopolymers such as xanthan gum, PHA, alginate, etc.

CO2   Apply the knowledge of principles and applications of animal and plant tissue culture techniques, and immobilization techniques.

CO3   Build the understanding of IPR, Patent, Criteria for patentability, Indian patent act, Role of the patent in R & D.

CO4   Compare industrial fermentation such as Penicillin, Mushroom, Glutamic acid, etc.

Course (Paper) Name and No.:V: Applied component Biotechnology

CO1   Explain the role of biotechnology in society

CO2   Examine the role of biotechnology in healthcare sector (animal & human healthcare, genetic counselling, and forensic medicine)

CO3   Inspect problems related to genetic engineering in plant biotechnology

CO4   Interpret the issues of bioenergy and biofuel in the world

Course (Paper) Name and No.: Paper I and II (Practicals)

CO1   Use methodology for molecular and colorimetric methods for isolation of macromolecules from microorganism.,

CO2   Analyze sequences using bioinformatics tools for local and global alignment.,

CO3   Estimate MIC and MBC of antibiotics, sensitivity, and resistance of antibiotics by Kirby-Bauer Method.,

CO4   Interpret blood type, and diagnose syphilis, typhoid infection by antigen antibody reaction.,

Course (Paper) Name and No.: Paper III and IV (Practicals)

CO1   Estimate concentration of protein by Lowry's method and UV absorption.

CO2   Determine kinetics of enzyme inhibition

CO3   Test for determination of unknown concentrations of antibiotic and growth factor using bioassay.

CO4   Demonstrate the knowledge of determining bioburden of samples.

Course (Paper) Name and No.: Paper V (Practicals)

CO1   Demonstrate the presence of carbohydrates using chemical reagents

CO2   Construct knowledge on the role of microorganisms in industrial biotechnology

CO3   Develop immobilized microbial cells using calcium alginate

CO4   Estimate the cellulase activity of microorganisms

Class: F.Y.B. Sc. Biotechnology

Semester I

Course (Paper) Name and No.: Paper-I Biotechnology-I (UBT1BIT)

CO1   Develop an understanding of developments in various fields of Biotechnology.

CO2   Relate to applications and benefits of Biotechnology in the fields of agriculture, livestock, human health and environment.

CO3   Justify the Biosafety rules and its implementation.

CO4   Elaborate the concept and significance of IPR.

Course (Paper) Name and No.: Paper-II Basics of Microbiology (UBT1BOM)

CO1   Build skill towards use of microscopy and staining techniques.

CO2   Explain the concepts of sterilization and the mechanism of disinfection.

CO3   Categorize different types of microorganisms based on their nutritional requirements.

CO4   Apply different methods and techniques for growth and enumeration of microorganisms.

Course (Paper) Name and No.: Paper-III Basic Chemistry-I (UBT1BCH)

CO1   Explain chemical bonds.

CO2   Develop skills towards use of titrimetric and gravimetric analysis.

CO3   Differentiate between chiral and achiral molecules and different enantiomers.

CO4   Illustrate of different types of chemical formulas.

Course (Paper) Name and No.: Paper-IV Biochemistry-I (UBT1BOC)

CO1   Discuss the chemistry of carbohydrates with their roles.

CO2   Explain Classification and general properties of Proteins.

CO3   Elaborate protein structure and function.

CO4   Enlist structure and functions of Nucleic acids

Course (Paper) Name and No.: Paper-V Cell Biology (UBT1CBI)

CO1   Discuss the ultrastructure, function and location of organelles in prokaryotic and eukaryotic cells

CO2   Illustrate the principles of membrane transport with different types of pumps and cell junctions.

CO3   Compare different phases of cell cycle along with roles of restriction points and Checkpoints.

CO4   Explain the role of apoptosis in maintenance and development of healthy cells.

Course (Paper) Name and No.: Paper-VI Genetics (UBT1GEN)

CO1   Compare different mechanisms of Genetic Exchange in Bacteria.

CO2   Illustrate Incomplete dominance, codominance and multiple alleles.

CO3   Explain the organization of Eukaryotic Genetic Material, in Chromosomal aberrations and Sex Determination

CO4   Interpret the Mendel's Principle in Human Genetics

Course (Paper) Name and No.: Paper-VII Environmental Science and Sustainable Development (UBT 1ESS)

CO1   Develop an understanding of the structure and functioning of the ecosystems.

CO2   Gain insights about the concept of pollution, climate change and sustainable development

CO3   Discuss the relevance of renewable energy sources and conservation of biodiversity

Course (Paper) Name and No.: Paper-VIII Computer Applications in Biotechnology (UBT1CAB)

CO1   Develop an understanding of computer networking and internet

CO2   Develop skills to use word processing, spreadsheet, and presentation software.

CO3   Develop skills to present biological data.

Semester II

Course (Paper) Name and No.: Paper-I Biotechnology- II (UBT2BIT)

CO1   Explain the basic principles of PTC and callus culture.

CO2   Develop an understanding of the application of biotechnology in the food industry.

CO3   Gain insight into details of genetic engineering.

CO4   Discuss tools and techniques used in medical biotechnology.

Course (Paper) Name and No.: Paper-II Microbiology and Immunology (UBT2MAI)

CO1   Compare replication mechanisms used by viruses along with their cultivation, purification techniques

CO2   Apply different methods and techniques for growth and enumeration of microorganisms.

CO3   Elaborate the concept of Immunity and role of antigens and immunoglobulin in the immune system.

CO4   Explain the Humoral and Cellular Immune Response

Course (Paper) Name and No.: Paper-III Basic Chemistry- II (UBT2BCH)

CO1   Develop an understanding of thermodynamics.

CO2   Learn about reaction kinetics and order of reaction.

CO3   Gain insight into the details of reaction mechanisms in Organic Chemistry.

Course (Paper) Name and No.: Paper-IV Bioorganic Chemistry- II (UBT2BOC)

CO1   Discuss the basics of lipid biochemistry.

CO2   Illustrate structure, functions and applications of enzymes.

CO3   Develop skills towards the principle, working and applications of different analytical techniques.

Course (Paper) Name and No.: Paper-V Molecular Biology and Genetic Engineering (UBT2MBG)

CO1   Compare the replication in prokaryotes and eukaryotes

CO2   Classify the different types of mutations

CO3   Illustrate different DNA repair mechanisms.

CO4   Explain details of genetic engineering

Course (Paper) Name and No.: Paper-VI Plant and Animal Physiology (UBT2PAP)

CO1   Interpret the intracellular organization of photosynthesis and Pathway

CO2   Explain the Physiological Processes of Plants and functions of plant growth regulators.

CO3   Develop a comprehensive and deep understanding of the vital physiological processes of animals.

CO4   Discuss concept of Human Nutrition

Course (Paper) Name and No.: Paper-VII Laboratory Skills & Biostatistics (UBT2LSB)

CO1   Make use of GLP, SOP and Biosafety guidelines

CO2   Develop skills towards preparation of standard solutions and buffers in the laboratory

CO3   Organize the biological data using statistical tool

Course (Paper) Name and No.: Paper-VIII Communication Skills

CO1 Develop an understanding of communication skills required to excel in real work Environment and corporate life.

CO2 Make use of technical and non-technical qualities in career planning

CO3 Learn about Leadership, team building, decision making and stress management

Class: S.Y.B. Sc. Biotechnology

Semester III

Course (Paper) Name and No.: Paper- I (Biophysics)

CO1   Demonstrate the   techniques   like Microscopy and Spectroscopy.

CO2   Illustrate the concept of heat, sound and fluid dynamics.

CO3   Make use of various electrophoretic techniques

CO4   Explain the various fundamentals and applications of Biophysics

Course (Paper) Name and No.: Paper- II (Applied Chemistry –I)

CO1   Categorize the different types of Organic reactions and its mechanism.

CO2   Explain the synthesis of organic compounds and other methods of organic synthesis.

CO3   Apply the principles of green chemistry in industrial applications.

CO4   Utilize green chemistry to reduce environmental pollution.

Course (Paper) Name and No.: Paper-III (Immunology)

CO1   Elaborate on different types of immune cells and lymphoid organs, role of effector molecules and complement system.

CO2   Explain the cellular and molecular aspects of lymphocyte activation, differentiation, and memory.

CO3   Apply different techniques based on Antigen-antibody interactions.

CO4   Illustrate the immunological response and how it is triggered and regulated.

Course (Paper) Name and No.: Paper-IV (Cell Biology and Cytogenetics)

CO1   Explain the structure and functions Cytoskeleton

CO2   Illustrate the principles of membrane transport with different types of pumps and cell junctions.

CO3   Elaborate on Genetic Linkage and DNA recombination

CO4   Solve problems based on Two-point Cross; Three-point Cross, Pedigree and Tetrad analysis

Course (Paper) Name and No.: Paper-V (Molecular Biology)

CO1   Compare the Transcription processes in Prokaryotes and Eukaryotes

CO2   Explain the Gene Expression Translation and post TranslationalModifications

CO3   Classify different vectors and enzymes used in genetic engineering with their applications.

CO4   Discuss the Mechanism of Gene Expression and Regulation

Course (Paper) Name and No.: Paper-VI (Bioprocess Technology)

CO1   Select types of microorganisms used in industrial processes.

CO2   Explain the design of a Fermenter and different fermentation processes.

CO3   Outline different assays for industrial products.

CO4   Develop knowledge about pharmacokinetics parameters, drug formulation routes and half-life.

Course (Paper) Name and No.: Paper-VII (Research Methodology)

CO1   Define the Research problem and its types through research methodology.

CO2   Explain the overall Process of research design and experimental design.

CO3   Organize Research Study fromits inception to its Report and oral presentations.

CO4   Develop the knowledge of research Ethics in Scientific Writing and Research Publication.

Course (Paper) Name and No.: Biotechnology Practical of UBT3BPH and UBT3APC Course Code: UBT3PR1

CO-1   Utilize different Spectroscopic and microscopic techniques.

CO-2   Make use of Electrophoretic techniques for separation of various biomolecules.

CO-3   Analyze the different types of organic compounds.

CO-4   Estimate different types of organic compounds like Acetone, amide and benzoic acid.

Course (Paper) Name and No.: Biotechnology Practical of UBT3IMM and UBT3CBC Course Code: UBT3PR2

CO-1   Make use of various immunological techniques

CO-2   Apply different immune-techniques in diagnostics of various diseases.

CO-3   Construct genetic maps using tetrad analysis and three point cross

CO-4   Outline principle and working of protein detection techniques.

Course (Paper) Name and No.: Biotechnology Practical of UBT3MOB and UBT3BPT Course Code: UBT3PR3

CO-1   Elaborate various stages in bioprocess thatinvolve upstream and downstream processes.

CO-2   Experiment with the actualfermentation process some metabolites.

CO-3   Make use of microbiological techniques in manufacture of industrial products.

CO-4   Examine the various screening techniques.

Semester IV

Course (Paper) Name and No.: Paper-I (Biochemistry) UBT4BIC

CO1   Explain the different Metabolic pathways.

CO2   Summarize the Electron transport chain and energy rich compounds.

CO3   Illustrate metabolic reactions involved in carbohydrate and lipid metabolism.

CO4   Identify disorders associated with lipids and nucleotide metabolism.

Course (Paper) Name and No.: Paper-II (Applied Chemistry –II) UBT4APC

CO1   Categorize sampling and techniques.

CO2   Classify different types of Natural products on the basis of their structures.

CO3   Analyze natural products using Chromatographic techniques.

CO4   Explain basic concepts of Polymers and Nanomaterial.

Course (Paper) Name and No.: Paper-III (Medical Microbiology) UBT4MEM

CO1   Identify common infectious agents and summarize the epidemiology of infectious diseases.

CO2   Interpret various disease factors and processes caused by different microorganisms.

CO3   Elaborate on pathogenesis, diagnosis and treatment involved in GI, STD and Nosocomial infections.

CO4   Explain the various aspects of Systemic Infections including Causative Agents, symptoms and Prophylaxis.

Course (Paper) Name and No.: Paper-IV (Environmental Biotechnology) UBT4ENB

CO1   Compare causes, types and control methods of Air, soil and water pollution.

CO2   Apply techniques used in Solid Waste Management.

CO3   Explain different global environmental problems and issues.

CO4   Elaborate on Bioremediation technology in environmental pollution.

Course (Paper) Name and No.: Paper-V (Bioinformatics and Biostatistics) UBT4BBI

CO1   Build the basic concepts and use of computers, internet.

CO2   Make use of various Biological database, multiple sequence alignment tools

CO3   Solve problems based on correlation and regression analysis

CO4   Test the hypothesis using z test, t test and x2 test

Course (Paper) Name and No.: Paper-VI (Molecular Diagnostics) UBT4MOD

CO1   Outline the techniques used in Basic Molecular diagnostics.

CO2   Construct the restriction map.

CO3   Infer the knowledge of different types of PCR and its quality control.

CO4   Identify DNA polymorphism and molecular diagnostic tools for infectious diseases with ethical, legal and social issues in regards to genetic counselling.

Course (Paper) Name and No.: Paper-VII (Entrepreneurship Development) UBT4END General Elective

CO1   Outline the concept and role of Entrepreneurs in Entrepreneurship Development.

CO2   Plan and set up the Enterprises through various resources.

CO3   Build enterprises and bio-business through innovations.

CO4   Explain the concept of Intellectual property rights, regulatory affairs and corporate laws.

Course (Paper) Name and No.: Biotechnology Practical of UBT4BIC and UBT4APC Course Code: UBT4PR1

CO1   Apply different estimation techniques in Biochemistry.

CO2   Demonstrate the organ Function tests: Liver (SGPT, SGOT) and Urine Analysis

CO3   Identify different types of organic compounds with known chemical types.

CO4   Infer the characterization of nanoparticles using different methods

Course (Paper) Name and No.: Biotechnology Practical of UBT4MEM and UBT4ENB Course Code: UBT4PR2

CO1   Develop skill for isolation, staining and identification of various microorganisms.

CO2   Make use of various Diagnostics techniques.

CO3   Evaluate the various parameters for effluent treatment.

CO4   Identify the microorganism used in bioremediation.

Course (Paper) Name and No.: Biotechnology Practical of UBT4 BBI and UBT4 MOD Course Code: UBT4 PR3

CO1   Apply basic practical techniques of bioinformatics.

CO2   Make use of various biological data bases.

CO3   Utilize the techniques for isolation and detection of nucleic acids.

CO4   Solve problems based on correlation, regression and non-parametric test

Class: T.Y.B. Sc. Biotechnology

Semester-V

Course (Paper) Name and No.: Paper-I (Cell Biology) UBT5CBI

CO1   Explain principles of cell signaling

CO2   Compare the stages, mechanisms and patterns of embryonic development in different model organisms.

CO3   Illustrate the plant developmental biology from early pattern formation in plants to organization of root and shoot meristem.

CO4   Elaborate on types, causes, diagnosis and treatment of cancer

Course (Paper) Name and No.: Paper-II (Medical Microbiology & Instrumentation) UBT5MMI

CO1   Compare replication mechanisms used by viruses along with their cultivation, purification techniques

CO2   Analyze the importance of appropriate drug therapy by learning development of drug resistance mechanism

CO3   Explain the causes of newly emerging diseases and role of vaccines.

CO4   Illustrate the basic principles of spectroscopy and tracer techniques.

Course (Paper) Name and No.: Paper-III (Genomics & Molecular Biology) UBT5GMB

CO1   Make use of different methods of gene transfer in plants and animals.

CO2   Explain significance of GMOs.

CO3   Determine the sequences of DNA and the library screening methods.

CO4   Discuss different human genome mapping methods and gene editing tools.

Course (Paper) Name and No.: Paper-IV (Marine Biotechnology) UBT5MBI

CO1 Classify the Marine organisms with bioprospecting.

CO2 Explain applications of Marine Biotechnology in different areas.

CO3 Apply various techniques used in seafood processing.

CO4 Construct the aqua farms, mass culture of microalgae and formulation of fish feeds.

Course (Paper) Name and No.: Paper-V (Biosafety-Applied Component) UBT5BIS

CO1 Outline the Biological hazardous agent and its management.

CO2 Explain the basic biosafety guidelines and regulations related to GMOs and LMOs.

CO3 Identify possible types of contaminants in Pharmaceutical products.

CO4 Tell the significance of recombinant DNA technology and bioethics.

Course (Paper) Name and No.: Biotechnology Practical
Cell Biology+ Medical Microbiology & Instrumentation Course Code:UBT5PR1

CO1 Estimate MIC, MLC, sensitivity, and resistance of antibiotics.

CO2 Determine Bacteriophage Titers and presence of Covid antigen.

CO3 Explain the concepts of Cancer Genetics and visiting Cancer Research Institute.

CO4 Identify types of Meristems, structure of anther, and stages of embryo sac development.

Course (Paper) Name and No.: Biotechnology Practical
Genomes & Molecular Biology + Marine Biotechnology Course Code:UBT5PR2

CO1 Experiment with molecular biology techniques.

CO2 Estimate transformation efficiency

CO3 Measure amount of antioxidant, carotenoid, gelatine and collagen from marine sources

CO4 Formulate of Fish Feed from plant source and silage from fish waste

Course (Paper) Name and No.: Biotechnology Practical Applied Component: Biosafety Course Code:UBT5PR3

CO1   Develop a realistic approach to solve safety related issues through case studies.

CO2   Test presence of adulterants in the food

CO3   Inspect sterility of pharma- products

CO4   Estimate Vitamin B12 from bacterialsource

Class: T.Y.B. Sc. Biotechnology
Semester VI

Course (Paper) Name and No.: Paper- I Biochemistry UBT6BIC

CO1   Build the knowledge of protein structures and protein purification techniques.

CO2   Explain metabolic pathways of carbohydrates, and Cholesterol with its regulation.

CO3   Classify the Hormones Based on their mechanism of action.

CO4   Identify the disorders associated with endocrine function.

Course (Paper) Name and No.: Paper-II (Industrial Microbiology) UBT6IMI

CO1   Illustrate on production of different dairy products.

CO2   Explain the process of inoculum development with suitable examples.

CO3   Compare the different Down-stream Processing.

CO4   Summarize requirements of QA-QC along with various documentation & Audit reports.

Course Name and No.: Paper-III (Pharmacology and Neurochemistry) UBT6PNE

CO1   Illustrate the mechanisms of action of drugs on tissues vitro and in vivo.

CO2   Outline of absorption, Distribution, Metabolism and Excretion of Drugs.

CO3   Interpret different poison and toxins in regards to basic and regulatory toxicology with treatments.

CO4   Explain neuronal pathways and mechanism of propagation of nerve impulse along with associated drugs.

Course Name and No.: Paper-IV (Environmental Biotechnology) UBT6ENB

CO1   Discuss the types of energy resources and alternate fuel sources from biomass energy

CO2   Illustrate different methods used in Industrial Effluent Treatment.

CO3   Evaluate the functioning of technology involved in waste water treatment using aerobic and anaerobic methods.

CO4   Explain various treatment methods for hazardous waste management.

Course (Paper) Name and No.: Paper-V (Agri Biotechnology) UBT6ABT

CO1   Explain Greenhouse Technology, Agriculture system and Precision Agriculture/ Cultivation System

CO2   Illustrate the different biotechnological tools and techniques for crop improvement.

CO3   Select different molecular markers in plant breeding.

CO4   Make use of microbes as bio-fertilizers, PGRs and bio-pesticides.

Course (Paper) Name and No.: Practical Biochemistry + Industrial Microbiology Course Code: UBT6PR1

CO1   Assess microbiological quality of milk

CO2   Determine blood glucose and serum cholesterol

CO3   Demonstrate various protein purification techniques

CO4   Solve the problems related to hormones.

Course (Paper) Name and No.: Practical Pharmacology - Neurochemistry and Environmental Biotechnology (50M)+ Project work (50M) Course Code: UBT6PR2

CO1   Evaluate Lethal dose and lethal concentration using a suitable model.

CO2   Assess quality of industrial effluent samples by physico-chemical methods.

CO3   Develop understanding of techniques used in Effluent Treatment Plant.

CO4   Make use of techniques used in Cell biology, Biochemistry, Immunology, Microbiology and Environmental Biology.

Course (Paper) Name and No.: Practical Agri Biotechnology Course Code: UBT6PR3

CO1   Make use of microbial techniques for enrichment and isolation of soil microbes.

CO2   Measure abiotic stress tolerance in model plants.

CO3   Formulate biofertilizer and hydroponics nutrient solution for plant growth.

CO4   Summarize the facilities available in the Greenhouse plant.

Class: F.Y.B. Sc. Computer Science
Semester I

Course (Paper) Name and No.: Computer Organization and Design, Sem-I Code: UCS1COD

CO1   Explain the underlying principles of computers

CO2   Analyze the Instruction set architecture

CO3   Analyze the role of various hardware components of processor

CO4   Analyze how data is transferred between various peripheral devices in the computer

Course (Paper) Name and No.: Programming with Python-I, Sem-I Code: UCS1PP1

CO1   Understand the pros and cons of scripting languages vs. classical programming languages

CO2   Understand Python programming basics and paradigm

CO3   Apply loops, control statements, and string manipulations

CO4   Illustrate the use of lists, tuples & dictionaries for representing compound data

Course (Paper) Name and No.: Programming with C, Sem-I Code: UCS1PWC

CO1   Explain the basic programming concepts and broad view of programming language.

CO2   Apply programming concepts such as operators, primitive data types, and loops

CO3   Illustrate the use of an array, pointer, and file handling techniques

CO4   Demonstrate the use of strings and string handling functions

Course (Paper) Name and No.: Database Systems, Sem-I Code: UCS1DBS

CO1   Analyze database requirements and determine the entities involved in the system and their relationship to one another.

CO2   Create tables and insert/update/delete data, and query data in a relational DBMS using MySQL commands.

CO3   Understand the normalization and its role in the database design process.

CO4   Implement simple queries to MySQL related to String, Maths and Date Functions.

Course (Paper) Name and No.: Discrete Mathematics, Sem-I Code: UCS1DM

CO1   Explain the function, types of function and relation

CO2   Solve the problem on recurrence relation

CO3   Analyze the permutation, combination and counting principle

CO4   Examine the properties of the graph,

application of graph and trees

Course (Paper) Name and No.: Descriptive Statistics and Introduction to Probability, Sem-I Code: UCS1DSP

CO1   Understand and present data using table and graphs

CO2   Apply measures of central tendency and dispersion to draw conclusions

CO3   Apply the basic probability rules and theorem in problem-solving

CO4   Apply the method of least squares to estimate the parameters in a regression model

Course (Paper) Name and No.: Soft Skills Development, Sem-I Code: UCS1SSD

CO1   Develop Personality with the help of soft skills and hard skills

CO2   Analyze the importance of communication, etiquette, and manners

CO3   Identify the academic skills needed for employment

CO4   Develop professional skills like leadership, team building, and decision making

Course (Paper) Name and No.: Practical's of UCS1COD+UCS1PP1, Sem-I Code: UCS1PPR1

CO1   Analyze the working of combinational circuits using Logisim simulator

CO2   Develop assembly language programs using SPIM simulator

CO3   Develop solutions to simple computational problems using Python programs

CO4   Demonstrate programs using simple Python statements and expressions.

Course (Paper) Name and No.: Practical's of UCS1PWC+UCS1DBS, Sem-I Code: UCS1PPR2

CO1   Design a C program to implement the concept of function

CO2   Create user-defined data types such as structures and unions

CO3   Create simple queries to MySQL related to String, Maths and Date Functions.

CO4   Create a table, insert records, delete/update records

Course (Paper) Name and No.: Practical's of UCS1DMA+UCS1DSP, Sem-I Code: UCS1PPR3

CO1   Determine properties of function, relation and recurrence relation

CO2   Solve the problems by using Pigeonhole principle, Inclusion – Exclusion Principle , Permutation and Combination

CO3   Analyze data and manipulate it with functions by using R

CO4   Analyze data attributes with functions and other statistics packages.

Semester II

Course (Paper) Name and No.: Object Oriented Programming with C++, Sem-II Code: UCS1OOP

CO1   Understand object-oriented programming and the difference between structured oriented and object- oriented programming features.

CO2   Explain use of objects and classes for developing programs.

CO3   Apply virtual and pure virtual function & complex programming situations.

CO4   Illustrate various object-oriented concepts to solve different problems.

Course (Paper) Name and No.: Programming with Python-II, Sem-II Code: UCS2PP2

CO1   Design real-life applications by reading/writing to files, exceptions and concept of pattern matching

CO2   Design GUI applications using Graphical User Interface controls

CO3   Explain the concepts of database connect and to move the data to/from the application.

CO4   Explain Network Interface, read from URL and send email.

Course (Paper) Name and No.: Linux, Sem-II Code: UCS2LIN

CO1   Explain the Importance of Linux in Software Ecosystem and Architecture of Linux.

CO2   Apply various command line utilities.

CO3   Design Network using IP address, DNS and different network protocols.

CO4   Apply System Administrative task on network.

Course (Paper) Name and No.: Data Structures, Sem-II Code: UCS2DST

CO1   Describe data structures and different abstract data types

CO2   Apply implementation of linked structures

CO3   Differentiate linear probing, rehashing and clustering

CO4   Evaluate different implantations of tree   traversals like binary tree, heap and search
          trees

Course (Paper) Name and No.: Calculus, Sem-II Code: UCS2CAL

CO1   Recall the limit, continuity and derivative of a function.

CO2   Explain the properties and application of derivatives.

CO3   Examine the properties and application of integration.

CO4   Define partial derivatives and application of derivatives.

Course (Paper) Name and No.: Statistical Methods and Testing of Hypothesis, Sem-II Code: UCS2SMH

CO1   Illustrate different probability functions with respect to discrete and continuous
          random variables.

CO2   Determine the hypotheses and validate using appropriate statistical tests

CO3   Recognize when analysis of variance (ANOVA) is appropriate and be able to perform
          one-way and two-way ANOVAs.

CO4   Comparison of parametric and nonparametric tests and identification of applications
          where nonparametric approaches are appropriate.

Course (Paper) Name and No.: Digital Marketing, Sem-II Code: UCS2DIM

CO1   Explain use of Digital Media in Marketing.

CO2   Aware about cyber laws related to digital marketing

CO3   Explain benefits of digital marketing over traditional marketing

CO4   Summarize various tools of social media and Digital Marketing

Course (Paper) Name and No.: Practical's of UCS2DSY+UCS2PP2, Sem-II Code: UCS2PPR1

CO1   Design E-R diagram and convert it to tables

CO2   Create database and perform CRUD operation

CO3   Design and develop graphical user interface application and implement networking concepts

CO4   Create database using python programming

Course (Paper) Name and No.: Practical's of UCS2LIN+UCS2DST, Sem-II Code: UCS2PPR2

CO1   Demonstrate installation of Linux distribution (Ubuntu, Fedora, Debian) using various modes.

CO2   Explain security of Linux, command line interface, graphical user interface.

CO3   Design implementation of different linked structures with the help of data structures and ADTs

CO4   Evaluate different sorting algorithms and its time complexities

Course (Paper) Name and No.: Practical's of UCS2CAL+UCS2SMH, Sem-II Code: UCS2PPR3

CO1   Find the solution by using Newton's Method, Euler's Method , first order first degree differential equation

CO2   Examine Maxima and minima of functions, partial derivatives of a functions

CO3   Analyse and manipulate data with in-build functions for hypothesis testing.

CO4   Understand the important applications of chi square test and able to conduct different non parametric tests

Class: S.Y.B. Sc. Computer Science

Semester III

Course (Paper) Name and No.: Theory of Computation (P-I) UCS3TOC

CO1   Summarize the mathematical concepts of theoretical computer science

CO2   Build abstract machines using associated languages and grammars

CO3   Apply rigorous formal mathematical methods to prove properties of languages, grammars, and automata

CO4   Evaluate solvable and unsolvable problems

Course (Paper) Name and No.: Core Java (P-II) UCS3CJV

CO1   Design java-based applications using Object-oriented features

CO2   Demonstrate the use of predefined and customizable packages for real-time applications

CO3   Explain the concepts of Wrapper classes, Collections, and Inner classes

CO4   Explain the concepts of File, Exception handling and Networking

Course (Paper) Name and No.: Operating System (P-III) UCS3OPS

CO1   Describe the fundamental structure of an operating system

CO2   Utilize operating system algorithms such as CPU scheduling, Process, and Deadlock

CO3   Analyze the behavior of the operating system in terms of process synchronization and coordination.

CO4   Illustrate the concept of file and memory management of an operating system

Course (Paper) Name and No.: Database Management System (P-IV) UCS3DMS

CO1   Describe the principles of database management systems.

CO2   Identify different storage and recovery techniques used in database systems.

CO3   Apply crash recovery and transaction management techniques on database

CO4   Build a PL/SQL program that will handle data manipulation operations using Oracle databases

Course (Paper) Name and No.: Combinatorics and Graph Theory (P-V) UCS3CGT

CO1   Utilize combination, permutation, and enumeration techniques to solve counting problems

CO2   Apply the basic concepts of graph theory, such as Eulerian trails, Hamiltonian cycles, bipartite graphs, and planar graphs

CO3   Evaluate real-time problems using the concept of graph theory.

CO4   Choose different strategies to find out the optimal solution.

Course (Paper) Name and No.: Physical Computing and IOT Programming (P VI) UCS3IOT

CO1   Analyze System on Chip Architectures

CO2   Explain the preparation of Raspberry Pi hardware and installation

CO3   Apply Linux commands to configure Raspberry Pi

CO4   Demonstrate the use of predefined raspberry pi interfaces for real-time applications

Course (Paper) Name and No.: Skill Enhancement: Web Programming (P-VII) UCS3WBP

CO1   Design valid, and meaningful web pages using emerging technologies.

CO2   Develop client-side and server-side web applications using scripting language

CO3   Develop database-driven web-based applications

CO4   Create web-based applications using XML

Course: Practical of UCS3CJV+UCS3OPS + UCS3DMS Course Code: UCS3PR1

CO1   Develop a client-server application using multithreading, and networking

CO2   Create a graphical user interface using Abstract Windowing Toolkit

CO3   Evaluate the working of operating system algorithms using java technology

CO4   Build PL/SQL code block for data validation and transaction management of database

Course: Practical of UCS3CJV+UCS3OPS + UCS3DMS Course Code: UCS3PR1

CO1   Apply Dijkstra's algorithm to find the shortest path in the graph.

CO2   Demonstrate the use of Ford Fulkerson algorithm to find out maximum flow in a
Network

CO3   Create IoT-based projects using Raspberry Pi

CO4   Develop static web pages using HTML, CSS, and JavaScript

Semester IV

Course (Paper) Name and No.: Fundamentals of Algorithm (P-I) UCS4FOA

CO1   Understand concepts of algorithms to design efficient program

CO2   Formulate problems as an algorithmic problem with optimize solution

CO3   Apply types of Data Structures to real world problem

CO4   Analyze algorithms for Time and Space Complexity.

Course (Paper) Name and No.: Advanced Java (P-II) UCS4AJV

CO1   Explain the concepts of J2EE architecture and MVC Architecture along with struts framework.

CO2   Design dynamic web applications using java database connectivity and server side technologies.

CO3   Understand and explore use of java server programming

CO4   Design java application using JavaBeanS and JSON

Course (Paper) Name and No.: Computer Network (P III) UCS4CNT

CO1   Explain the concepts of networking

CO2   Analyze IP addressing and its role in networking

CO3   Analyze the role of each layer in the network model

CO4   Outline the role of protocols provided by each layer of network model

Course (Paper) Name and No.: Software Engineering, Paper IV UCS4SEN

CO1   Illustrate the different phases of Software development life cycle

CO2   Apply software testing and quality assurance concepts while developing software

CO3   Design and develop software requirement specification documents using OOAD

CO4   Understand software measurement and metrices

Course (Paper) Name and No.: Linear Algebra using Python (V) UCS4LAP

CO1   Develop a computational thinking using mathematical solutions

CO2   Apply linear algebra concepts with help of NumPy and matplotlib libraries of python

CO3   Understand span, linear independence, basis, and dimension, and apply these concepts to various vector spaces and subspaces.

CO4   Relate the concepts of linear algebra in the field of computer science

Course (Paper) Name and No.: .NET Technologies (P-VI) UCS4NET

CO1   Understand the .NET framework

CO2   Develop a proficiency in the C# programming language

CO3   Proficiently develop ASP.NET web applications using C#

CO4   Use ADO.NET for data persistence in a web application

Course (Paper) Name and No.: Skill Enhancement: Android Developer Fundamentals (PVII) UCS4ADF

CO1   Demonstrate the Understanding of fundamental of Android Programming.

CO2   Sketch attractive Interfaces by using layouts and controls.

CO3   Develop Android applications by using Java programming language

CO4   Demonstrate programming skills for managing tasks on mobile platform

Course: Practical of UCS4FOA+UCS4AJV + UCS4CNT Course Code: UCS4PR1

CO1   Develop Programs using python with help of searching, sorting and traversing methods of algorithms

CO2   Design dynamic web Applications using Servlets and JSP

CO3   Develop Swing-based Graphical user Interface

CO4   Apply the networking commands in order to troubleshoot network problems and analyze the network with the help of the networking analyzer tool

Course: Practical of UCS4LAP+ UCS4NET + UCS4ADF Course Code: UCS4PR2

CO1   Design and develop C# programs using core concepts

CO2   Design Server side ASP.NET Pages using server control , web control , rich control, and

Ajax

CO3   Evaluate the concepts of metrics using python

CO4   Design and develop mobile applications on Android Platform

Class: T.Y.B. Sc. Computer Science

Semester V

Course (Paper) Name and No.: Artificial Intelligence (Elective-I-P-I)   UCS5AIN

CO1   Explain the concepts, techniques and building blocks of AI

CO2   Apply different AI strategies for problem-solving, inference, vision, knowledge representation, and learning

CO3   Design and develop various applications of AI techniques in Intelligent agent, and Expert system

CO4   Compare different reinforcement learning approaches

Course (Paper) Name and No.: Linux Server Administration UCS5LSA(Elective-I-P-II)

CO1   Demonstrate the installation of Linux server

CO2   Demonstrate the role and responsibilities of a Linux system administrator

CO3   Develop and maintain Linux-based system

CO4   Apply appropriate service on Linux server as per requirement

Course (Paper) Name and No.: Software Testing and Quality Assurance UCS5SQA (Elective-I-P-III)

CO1   Understand the principles and practices of cryptographic techniques.

CO2   Understand a variety of generic security threats and vulnerabilities.

CO3   Understand various protocols for network security to protect against the threats in a network

CO4   Identify & analyze particular security problems for a given application and actual implementation using practical.

Course (Paper) Name and No.: Information and Network Security UCS5INS (Elective-II-P-I)

CO1   Identify generic security threats and vulnerabilities

CO2   Analyze information and network security Problems

CO3   Assess and Apply various cryptographic techniques

CO4   Implement security solutions for confidentiality, authentication, and privacy

Course (Paper) Name and No.: Architecting of IoT UCS5IOT (Elective-II-P-II)

CO1   Design & develop IoT Devices

CO2   Evaluate various IOT data link layer protocols

CO3   Evaluate various IOT Network layer protocols

CO4   Demonstrate the working of sensors, Actuators

Course (Paper) Name and No.: Web Service UCS5WEB (Elective-II-P-III)

CO1   Describe the web service specification standards and the primitives of Service Oriented Architecture

CO2   Create web services using core components of the framework

CO3   Examine the principles and applications of SOAP-based and REST-based web services

CO4   Develop secure and quality-based web services

Course (Paper) Name and No.: Skill Enhancement Game Programming Course Code: UCS5GPG

CO1   Apply geometric concepts for the preparation of animation clips

CO2   Demonstrate the use of DirectX graphical engine

CO3   Describe the architecture of Graphical Processing Unit

CO4   Differentiate Augmented, Virtual, and Mixed Reality techniques

Course: Practical of Elective-I Course Code: UCS5PR1

CO1 Apply informed and uninformed searching techniques to find out an optimum path for the given problem

CO2 Create a decision tree for classification of data set

CO3 Apply Selenium automation tool for testing web-based application and quality assurance

CO4 Illustrate configuration of different types linux server

Course: Practical of Elective-II Course Code: UCS6PR2

CO1 Design and Develop Cryptographic technique for security of information.

CO2 Develop IOT-based project with the help of various IOT interfaces

CO3 Design SOAP-based and REST-based web services.

CO4 Build a web service using WCF.

Course: Project Implementation Course Code: UCS5PRJ

CO1 Design and develop computer-based software for current and advanced trends

CO2 Demonstrate communication and technical skills

Course: Practical of Skill Enhancement Course Code: UCS5PR3

CO1 Develop 2D and 3D Android and web-based game

CO2 Develop Animator Controller using Unity

Semester VI

Course (Paper) Name and No.: Cloud Computing (Elective-I P-I) UCS6CLC

CO1   Explain delivery models of cloud computing architecture

CO2   Describe the functions of a virtual data centre and cloud computing

CO3   Analyse the Software as a Service in cloud computing

CO4   Apply cloud computing frameworks in different environment

Course (Paper) Name and No.: Cyber Forensics (Elective-I P-II) UCS5CRF

CO1   Plan and Prepare all stages of an investigation to collect evidences

CO2   Analyse information gathered and report them in the form of document to present in the court

CO3   Analyse legal aspect and Ethics in cyber forensics

CO4   Evaluate real time case study in cyber forensics

Course (Paper) Name and No.: Wireless Sensor Network and mobile communication (Elective-I-P-III) USCS601

CO1   Demonstrate the functioning of wireless communication system and standards

CO2   Explain multiple access techniques for Wireless Communication

CO3   Understand various applications of wireless network

CO4   Design and implementation of wireless sensors

Course (Paper) Name and No.: Information Retrieval (Elective-II-P-I) UCS6INR

CO1   Describe the field of Information retrieval and its relationship to search engines

CO2   Compare different types of link analysis and specialized search methods.

CO3   Examine the different retrieval metrics for evaluating information retrieval.

CO4   Analyse various search engine optimization techniques.

Course (Paper) Name and No.: Digital Image Processing (Elective-II-P-II) UCS6DIP

CO1   Describe the fundamental concepts of a digital image processing system.

CO2   Analyse the images in the frequency domain using various transforms.

CO3   Evaluate image enhancement techniques.

CO4   Apply various compression and segmentation techniques.

Course (Paper) Name and No.: Data Science (Elective-II-P-III) UCS6DSC

CO1   Describe the concept of data, information and knowledge

CO2   Apply different data mining techniques to real world business problems and interpret results using data visualization techniques

CO3   Analyse ethical issues related to data security and privacy in business

CO4   Develop data mining models

Course (Paper) Name and No.: Skill Enhancement Ethical Hacking UCS6ETH

CO1   Identify different phases of an attack

CO2   Demonstrate security, vulnerabilities and weakness in target application

CO3   Identify legal and ethical issues related to vulnerability and penetration testing.

CO4   Test and exploit system using various tools and understand impact of hacking and real time machines

Course: Practical of Elective-I Course Code: UCS6PR1

CO1   Demonstrate the use of Software as a Service and Infrastructure as a Service

CO2   Construct a virtual environment using VM ware or Virtual Box

CO3   Test and Analyze Evidences of crime

CO4   Demonstrate Data Back-up and Data Recovery

Course: Practical of Elective-II Course Code: UCS6PR2

CO1   Test the different types of search engine algorithms and techniques.

CO2   Analyse Hadoop framework and the working of Map Reduce.

CO3   Apply Linear regression method to the dataset

CO4   Test different types of retrieval methods of NoSQL database

CO5   Calculate different types of transforms for the given 2D matrix and Apply various techniques of image compression and enhancement

Course: Project Implementation Course Code: UCS5PRJ

CO1   Design and develop computer-based software for current and advanced trends

CO2   Demonstrate communication and technical skills

Course: Practical of Skill Enhancement Course Code: UCS6PR3

CO1   Apply techniques to secure information from malicious attack

CO2   Demonstrate the exploitation of Windows7 using Kali Linux

Class: F. Y. B.Sc. Information Technology

Semester I

Course (Paper) Name and No.: Introduction to C++ Programming Code: UIT1ICP

CO1   Define basic C++ programming concepts.

CO2   Elaborate concepts of functions in C++.

CO3   Explain derived data types such as Arrays and Pointers.

CO4   Determine different string functions and concepts of structures.

Course (Paper) Name and No.: Digital Electronics Code: UIT1DEL

CO1   Define the various types of number systems & Timing Circuits.

CO2   Explain the various types of logic gates along with the truth tables.

CO3   Distinguish combinational and sequential logic circuits.

CO4   Classify different types of flip-flops, registers, counters and ROM.

Course (Paper) Name and No.: Operating Systems Code: UIT1OST

CO1   Explain the importance of Computer Systems, Process Management Policies.

CO2   Define the memory management and its allocation policies.

CO3   Elaborate the Cloud concepts, file systems, it's structure and operations.

CO4   Determine the requirement for process synchronization and coordination handled by the operating system.

Course (Paper) Name and No.: Discrete Mathematics Code: UIT1DMS

CO1   Explain set theory definitions, logic form and quantified statements

CO2   Evaluate the recurrence relations, functions, probability, combinations as well as the mathematical induction.

CO3   Evaluate the shortest path of trees and the minimum spanning trees using algorithms.

CO4   Prove examples on direct proofs,   divisibility, quotient-remainder theorem and indirect argument.

Course (Paper) Name and No.: Communication Skills Code: UIT1CST

CO1   Make use of the basics of Business communication.

CO2   Elaborate examples on how to write business messages appropriately and propose the views in meetings and group discussions

CO3   Develop Communication skills in different fields or departments.

CO4   Design presentation skills

Course (Paper) Name and No.: Introduction to C++ Programming Practical Code: UIT1CPP

CO1   Develop Simple C++ Programs.

CO2   Construct C++ programs using conditional statements and loops.

CO3   Make use of functions in C++ programs.

CO4   Build C++ Programs using Arrays.

Course (Paper) Name and No.: Digital Electronics Practical Practical Code: UIT1DEP

CO1   Classify logic gates and their ICs and universal gates.

CO2   Simplify the given Boolean expressions using a minimum number of logic gates and ICs.

CO3   Build combinational circuits, code converters and Diode ROM array.

CO4   Design Encoder, Decoder, Multiplexer, Demultiplexer and 555 Timing Circuits.

Course (Paper) Name and No.: Operating Systems Practical Practical Code: UIT1OSP

CO1   Build virtual operating system.

CO2   Demonstrate linux commands.

CO3   Make use of utilities of windows. linux and cloud.

CO4   Choose windows commands for file, folder creation.

Course (Paper) Name and No.: Discrete Mathematics Practical Practical Code: UIT1DMP

CO1   Make use of the basic commands of scilab.

CO2   Construct a formula for recurrence relation, counting and probability using scilab.

CO3   Analyze the concept of properties of integers and operations using scilab.

CO4   Estimate the paths in graph theory, adjacency matrix and basic definitions in Boolean algebra using scilab.

Course (Paper) Name and No.: Communication skills Practical Practical Code: UIT1PCP

CO1   Develop pronunciation skills, listening skills, writing skills

CO2   Construct storytelling, advertising, role plays and situational conversations

CO3   Take part in interviews and group discussions

CO4   Build presentations

Class: F. Y. B.Sc. Information Technology

Semester II

Course (Paper) Name and No.: Object Oriented Programming Code: UIT2OPT

CO1   Explain characteristics of object oriented programming approach with C++

CO2   Make use of operators in C++

CO3   Evaluate the concept of Template, Strings, Streams

CO4   Utilize different file handling features

Course (Paper) Name and No.: Microprocessor Architecture Code: UIT2MAT

CO1   Explain Microprocessor, Microcomputer and Assembly Language.

CO2   Elaborate the concepts of Microprocessor Architecture, Interface Devices and Assembly Language.

CO3   Make use of counter and time delay, Stack and Subroutines.

CO4   Explain 8086 microprocessor, Software Development Systems and Interrupt.

Course (Paper) Name and No.: Database Management System Code: UIT2DMS

CO1   Design E-R model to represent database

CO2   Design the database with normalization

CO3   Explain the fundamental of RDBMS

CO4   Explain the transactions of database and basic of PL/SQL

Course (Paper) Name and No.: Numerical methods Code: UIT2NMS

CO1   Solve algebraic, transcendental and simultaneous systems of equations using numerical methods.

CO2   Evaluate the functions and their derivatives using interpolation.

CO3   Estimate the numerical solution of differential equations and integration.

CO4   Estimate the characteristics value using power method and solutions to linear systems of equations using direct methods.

Course (Paper) Name and No.: Web Programming Code: UIT2WPT

CO1   Illustrate the HTML5 tags and CSS used to develop web pages.

CO2   Make use of bootstrap for faster and easier web development.

CO3   Elaborate the creation of dynamic web pages using server side PHP programming and Database connectivity.

CO4   Explain javascript event handling and functions.

Course (Paper) Name and No.: Object Oriented Programming Practical Code: UIT2OPP

CO1   Construct program using classes, constructors, inheritance

CO2   Design programs using virtual functions and abstract classes

CO3   Build program using operator overloading, template, exceptional handling and string handling

CO4   Utilize private function, friend function.

Course (Paper) Name and No.: Microprocessor Architecture Practical Code: UIT2MAP

CO1   Create simple Assembly Language Programs.

CO2   Evaluate operations on memory locations.

CO3   Develop packing and Unpacking operations.

CO4   Make use of register operations.

Course (Paper) Name and No.: Database Management System Practical Code: UIT2DSP

CO1   Build Basic Database and create database object.

CO2   Build SQL statement and join concept.

CO3   Modify E-R model to relational table.

CO4   Construct integrity constraints and set operations.

Course (Paper) Name and No.: Numerical methods Practical Code: UIT2NMP

CO1   Make use of the basic commands of scilab.

CO2   Construct a formula for interpolation using scilab.

CO3   Determine the differential equation and numerical integration using scilab.

CO4   Design the program in scilab for Eigenvalue problems and linear systems of equations.

Course (Paper) Name and No.: Web Programming Practical Code: UIT2WPP

CO1   Create web pages using HTML5,CSS and bootstrap.

CO2   Make use of XML and JQuery for interactive web pages.

CO3   Construct interactive web pages using javascript as client side scripting language.

CO4   Develop dynamic web pages using PHP as server side scripting language.

Class: S.Y.B. Sc. Information Technology

Semester III

Course (Paper) Name and No.: Python Programming (P-I) UIT3PYP

CO1   Explain the basic principles of the python programming language.

CO2   Create the python programs in functions, string, file handling & exception handling.

CO3   Explain facts of object-oriented concepts & modules.

CO4   Design GUI & Database applications.

Course (Paper) Name and No.: Data Structures (P-II) UIT3DST

CO1   Define the basics of algorithm analysis and array operations.

CO2   Elaborate Operations on Linked lists, Stack and Queue.

CO3   Explain Different searching and sorting techniques, tree and AVL tree structures.

CO4   Solve Problems based on graph and hashing techniques.

Course (Paper) Name and No.: Computer Networks (P-III) UIT3CNT

CO1   Explain the functions of   each layer in OSI & TCP/IP model.

CO2   Elaborate functions of data link layer & its protocols.

CO3   Define the concepts of Network layer routing protocols and IP addressing

CO4   Explain the working of different transport layer protocols.

Course (Paper) Name and No.: Advanced SQL (P-IV) UIT3DMS

CO1   Define different database objects to access oracle database

CO2   Elaborate the DDL and DML database statements and associated naming rules.

CO3   Explain database objects, users and grant privileges

CO4   Explain advanced database objects required for PL/SQL programs

Course (Paper) Name and No.: Applied Mathematics (P-V) UIT3MAT

CO1   Evaluate matrices using different methods and polar, exponential forms of complex as well as hyperbolic functions.

CO2   Analyze different solutions of the differential equation using various methods and differential equations with constant coefficients.

CO3   Explain the properties and theorems of laplace and integrate the laplace transform and evaluate differential equations using laplace transform.

CO4   Analyze double and triple integrals in polar coordinates and area, volume using double and triple integrals

Course: Python Programming Practical Course Code: UIT3PPP

CO1   Create programs of objects, strings, arrays, functions, etc.

CO2   Solve programming errors using exception handling

CO3   Construct the concepts of OOP like class, inheritance, polymorphism, encapsulation etc.

CO4   Design the GUI using database applications.

Course: Data Structures Practical Course Code:UIT3DSP

CO1   Develop different data structure techniques.

CO2   Create Linked list, Stack and Queue Operations.

CO3   Make use of searching and sorting techniques

CO4   Build a tree and display its elements

Course: Computer Networks Practical Course Code: UIT3CNP

CO1   Determine information about IP address.

CO2   Apply network commands for network configuration.

CO3   Utilize IP routing using routing techniques.

CO4   Make use of wireshark tool for IP packet scanning.

Course: Advanced SQL Practical Course Code: UIT3DMP

CO1   Apply DDL and DML statements to access database

CO2   Create database objects using SET operators

CO3   Build basic PL/SQL programs

CO4   Develop PL/SQL program using advanced database objects

Course: Mobile Programming Practical Course Code: UIT3MPP

CO1   Build a simple basic program using cordova commands.

CO2   Create an application using battery plugin and camera plugin.

CO3   Develop an application using contacts plugin, device plugin and accelerometer plugin.

CO4   Make use of Network Information plugin, splash screen plugin and vibration plugin.

Semester IV

Course (Paper) Name and No.: Core Java (P-I) UIT4CJT

CO1   Explain the basic concepts and terminologies of java programming.

CO2   Build java code using control structure iteration

CO3   Explain advanced class features.

CO4   Elaborate multithreading, IO file handling, exception handling and AWT application

Course (Paper) Name and No.: Introduction to Embedded System (P-II) UIT4EMB

CO1   Define the core components of embedded systems.

CO2   Explain the types of memory and embedded peripherals.

CO3   Make use of 8051 instruction sets.

CO4   Classify different types of operating systems and their characteristics.

Course (Paper) Name and No.: Computer Oriented Statistical Techniques (P III) UIT4COS

CO1   Apply discrete and continuous probability distribution to various problems.

CO2   Analyze the hypothesis as well as calculate confidence interval and the p-concept.

CO3   Apply Chi-square test for independence as well as goodness of fit.

CO4   Estimate bivariate and multivariate regression and correlation analysis and to construct ANOVA.

Course (Paper) Name and No.: Software Engineering (P-IV) UIT4SWE

CO1   Explain software life cycle model and knowledge about different phases of software life cycle.

CO2   Make use of different methodologies in software engineering.

CO3   Explain current theories, models and techniques that provide a basis for the software life cycle.

CO4   Elaborate techniques and tools necessary for engineering practice.

Course (Paper) Name and No.: Computer Graphics and Animation (PV) UIT4CGA

CO1   Classify various 2D & 3D transformations.

CO2   Define the basic computer graphics applications.

CO3   Explain algorithms of visible surface detection.

CO4   Explain principles of animation.

Course: Core Java Practical Course Code: UIT4CJP

CO1   Build basic programs by using operators

CO2   Make use of the data types, methods and constructors to write java program

CO3   Create a program on inheritance, vectors, multithreading and file handling concepts

CO4   Design GUI by using Exception handling

Course: Embedded System Practical Course Code:UIT4ESP

CO1   Design a reprogrammable embedded computer using 8051 microcontroller.

CO2   Develop a program to generate given time delay by using timer control registers.

CO3   Make use of components like seven-segment display, Oscilloscope and Stepper motor.

CO4   Create a program to generate traffic signals

Course: Computer Oriented Statistical Techniques (Practical) Course Code:UIT4COP

CO1   Illustrate basic commands and basic operations of the R tool.

CO2   Make use of R tool commands to calculate summary statistics

CO3   Evaluate testing of hypothesis estimate probability distribution using R tool

CO4   Develop the R programme to infer statistical analysis

Course: Software Engineering Practical Course Code: UIT4SEP

CO1   Evaluate products-startups implementing software process models in software engineering methods.

CO2   Design the diagram in an open-source tool: Star UML.

CO3   Construct systems using design principles.

CO4   Design the existing software using UML diagrams.

Course: Computer Graphics and Animation Practical Course Code: UIT4CGP

CO1   Make use of the graphic functions

CO2   Create 2D, 3D animation.

CO3   Apply line drawing, circle generation algorithm.

CO4   Design program for circle using flood fill, boundary fill algorithm.

Class: T.Y.B. Sc. Information Technology

Semester V

Course (Paper) Name and No.: Software Project Management (P-I) UIT5SPM

CO1   Define software project management and project planning

CO2   Explain risk management and resource allocation

CO3   Determine the cost of project based on project duration

CO4   Elaborate the quality of leadership skills

Course (Paper) Name and No.: Internet of Things (P-II) UIT5IOT

CO1   Explain Design Principles for Connected Devices

CO2   Elaborate the concepts of Prototyping Embedded Devices , its

         Physical Design and Online Components

CO3   Classify types of designing 3D modules.

CO4   Explain the Market perspective and Ethical concept of IOT.

Course (Paper) Name and No.: Advanced Web Programming (P-III) UIT5AWP

CO1   Explain the basic components concept of C# .NET framework language along with .NET

         framework.

CO2   Elaborate advanced web concept in ASP.NET.

CO3   Explain dynamic web page using ADO.NET fundamentals.

CO4   Make use of AJAX and XML programming skills in ASP.NET

Course (Paper) Name and No.: Linux System Administration (P-IV) UIT5LSA

CO1   Explain various commands to manage system level processes and handle software

         management on linux platforms.

CO2   Elaborate storage and user management on linux platforms.

CO3   Explain the detailed steps and files for configuration of different types of servers.

CO4   Make use of shell level programming in linux.

Course (Paper) Name and No.: Enterprise Java (P-V) UIT5ENJ

CO1   Explain servlet with java applications and database connectivity.

CO2   Elaborate the fundamentals and core concepts of cookies, session, file uploading, file downloading and request dispatcher, EJB applications and JNDI.

CO3   Explain JSP applications using JSTL.

CO4   Make use of knowledge of applications using concepts of persistence, object/relational mapping, JPA and Hibernate.

Course: Project Dissertation Course Code: UIT5PDP

CO1   Identify a problem definition

CO2   Estimate system requirement

CO3   Design data flow diagram

CO4   Plan the system design phase in SDLC

Course: Internet of Things Practical Course Code: UIT5ITP

CO1   Make use of Raspberry pi to display LED pattern,Time over 4-digit 7-segment and control whatsapp.

CO2   Build the interfacing of Raspberry pi with Oscilloscope,Fingerprint sensor,GPS Module

CO3   Create basic Home Automation using Raspberry Pi

CO4   Construct an application to monitor visitor using Raspberry Pi and Pi Camera.

Course Advanced Web Programming Practical Course Code: UIT5WPP

CO1   Build console application in C#.

CO2   Develop web applications with strong object-oriented principles.

CO3   Develop connection between web pages using ASP.NET AJAX.

CO4   Develop dynamic web pages in ASP.NET and XML

Course: Linux System Administration Practical Course Code: UIT5LAP

CO1   Make use of administrative level commands for user and storage management and Networking.

CO2   Construct the firewall rules for securing server with iptables and setup cryptographic services on linux machine.

CO3   Create the configuration for different types of servers.

CO4   Develop shell scripting programs on linux platform.

Course: Enterprise Java Practical Course Code: UIT5EJP

CO1   Create applications using servlet with cookies and session.

CO2   Develop the servlet IO, file applications and JSP applications.

CO3   Construct JSP, JSTL, EL and EJB applications

CO4   Build the EJB applications with different types of beans and JPA applications.

Semester VI

Course (Paper) Name and No.: Software Quality Assurance (P-I) UIT6SQA

CO1   Define quality of software project

CO2   Explain testing and different testing method

CO3   Elaborate software verification, validation and v test model

CO4   Classify level of testing

Course (Paper) Name and No.: Security in Computing (P-II) UIT6SCP

CO1   Evaluate and contrast computing security issues.

CO2   Explain computing security vulnerabilities and threats

CO3   Determine alternative countermeasures and controls

CO4   Classify virtual machines & cloud computing.

Course (Paper) Name and No.: Business Intelligence (P-III) UIT6BUI

CO1   Explain the framework of the computerized Business Intelligence System and decision support system.

CO2   Analyze data by choosing relevant models and algorithms for respective applications.

CO3   Explain Classification and clustering algorithms

CO4   Elaborate the applications of Business Intelligence.

Course (Paper) Name and No.:Principles of Geographic Information Systems (P-IV) USIT6GIS

CO1   Define Importance of GIS and its use in representation of the real world.

CO2   Explain data capture, storage, analysis, and output in a GIS.

CO3   Elaborate Map scale, projection and coordinate systems in GIS.

CO4   Explain Spatial data analysis and Data visualization.

Course (Paper) Name and No.: IT Service Management (P-V) UIT6ISM

CO1 Define basic concepts of IT Service management and service life cycle.

CO2 Explain Service Strategy, Service Design and its Principles.

CO3 Elaborate Service Transition and Service Operation in detail.

CO4 Explain CSI Model and Responsibility Model for Continual Service Improvement.

Course: Project Implementation Course Code: UIT6PIP

CO1 Design user interface for input

CO2 Develop coding for the system

CO3 Examine various system testing.

CO4 Predict the future scope of project

Course: Security in Computing Practical Course Code: UIT6SCP

CO1 Design Routers by OSPF, NTP, SSH

CO2 Create AAA Authentication

CO3 Apply and Verify Extended Numbered ACL

CO4 Test IPV6 by using firewalls & ACL

Course: Business Intelligence Practical Course Code: UIT6BIP

CO1 Import legacy data from different sources and apply ETL process on it

CO2 Apply classification and clustering algorithms

CO3 Apply linear and logistic regression algorithms

CO4 Examine what-if-analysis for data visualization

Course: Principles of Geographic Information Systems Practical Course Code: USIT6GIP

CO1 Utilize QGIS software for managing vector and raster data.

CO2 Build maps with attributes and different data sets.

CO3   Design georeferencing for maps.

CO4   Make Use of advanced GIS operations like Nearest Neighborhood analysis, automating map creation etc.

Course: Android Mobile Programming Practical Course Code: UIT6P6AMP

CO1   Build simple Android Applications.

CO2   Apply different resources and layouts in Android Programming.

CO3   Design Android applications using UI elements.

CO4   Develop applications based on Media, Telephone, Security and Permissions.

Class: F.Y.B. Sc. Zoology
Semester I

Course (Paper) Name and No.: Diversity in Non-chordates

CO1   Learners will be able to comprehend the diversity of animals

CO2   Learners will be able to understand the importance of classification

CO3   Learners develop insight of particular group and type study

Course (Paper) Name and No.: Cell biology

CO1   The learners can describe cell as structural and functional unit of life

CO2   Learners will differentiate prokaryotic and eukaryotic cell and role of various cell organelles.

CO3   Students are well known about use of techniques in cell biology.

Semester II

Course (Paper) Name and No.: Diversity in Chordates, Study of Shark and Ethology

CO1   Learners will be able to comprehend the diversity of animals.

CO2   Learners will be able to understand the importance of classification.

CO3   Learners develop insight of particular group and type study.

Course (Paper) Name and No.: Basics of Genetics

CO1   Learners will be able to understand the basic concepts of genetics.

CO2   Learners will be able to understand recombination and interaction of Genes

CO3   Learners will appreciate impact of genetics on diversity of animals.

Class: S.Y.B. Sc. Zoology

Semester III

Course (Paper) Name and No.: Fundamentals of Genetics, Chromosomes and Heredity, Nucleic acids (USZO301)

CO1   Describe the structure of chromosomes and its types and mechanisms of sex determination.

CO2   Differentiate the autosomes and sex chromosomes, euchromatin and heterochromatin.

CO3   Apply the principles of inheritance to study heredity

CO4   Analyze the Pedigree chart

Course (Paper) Name and No.: Study of Nutrition and Excretion, Respiration and circulation, Control and coordination, Locomotion and Reproduction (USZO302)

CO1   Recognize the increasing complexity of nutritional, excretory and osmoregulatory physiology in evolutionary hierarchy and correlate the habit and habitat with nutritional, excretory and osmoregulatory structures.

CO2   Explain the increasing complexity of respiratory and circulatory physiology in evolutionary hierarchy and correlate the habit and habitat with nutritional, excretory and osmoregulatory structures.

CO3   Analyze the cause and effect of alterations in chromosome number and structure.

CO4   Compare the process of control and coordination by nervous and endocrine regulation.

Course (Paper) Name: Developmental Biology, Ethology, Parasitology (USZO303)

CO1   Develop critical understanding relates with single cell fertilized egg become embryo

CO2   Compare different developmental stages.

CO3   State different types of animal behavior.

CO4   Describe the life cycle of specific parasites, the symptoms of the disease & its treatment.

Practical I

CO1   Extract and detect DNA and RNA

CO2   Explain Chromosome morphology and Polytene chromosome

CO3   Predict blood groups and Rh factor.

CO4   Solve the Problems in genetics and molecular biology

Practical II

CO1   Analyze of normal and abnormal constituents of Urine

CO2   Compare nutritional Apparatus, respiratory structures, locomotory organs, types of hearts

CO3   Test ammonia in water excreted by fish and uric acid from excreta of Birds

CO4   Prepare the field visit report   on vermicomposting unit or wild life sanctuaries

Practical III

CO1   Compare different developmental stages in amphioxus fish, frog and hen

CO2   Explain ethological aspects of animals

CO3   Describe ectoparasites and endoparasites with their Parasitic adaptations

CO4   Prepare and stain of temporary slides

Semester IV

Course (Paper) Name: Origin and Evolution of Life, Population and Evolutionary Genetics, Scientific Attitude, Methodology, Scientific Writing and Ethics in Scientific Research (USZO401)

CO1   Describe origin of life and different theories of evolution

CO2   Comprehend the mechanisms of speciation

CO3   Distinguish between microevolution, macroevolution and mega evolution.

CO4   Develop qualities such as critical thinking and analysis and develop the skills of scientific communication

Course (Paper) Name: Cell biology, endomembrane system and biomolecule (USZO402)

CO1   Describe the functioning of nucleus, extra nuclear organelles and understand the intricate cellular mechanisms involved

CO2   Explain composition of the transport mechanisms adopted by the cell and its organelles for its maintenance and composition of cell

CO3   Discuss intricacy of endomembrane system and the interlinking of endomembrane system for functioning of cell

CO4   Summarize the biological significance of carbohydrates, amino acids, proteins, lipids and nucleic acids

Course (Paper) Name: Economic Zoology (USZO403)

CO1   Describe basics of sericulture and its scope in India.

CO2   Identify varieties of silkworms, host-plants and aspects on silk extraction and the diseases afflicting silk-worms.

CO3   Apply the culture techniques of prawn, pearl and fish

CO4   Discuss dairy animals' management, the breeds and diseases

Practical I

CO1   Apply the techniques for gathering data in the field of Zoology.

CO2   Compare the prokaryotic cell and eukaryotic cell

CO3   Illustrate the relevance of fossils species in evolution

CO4   Evaluate the different methods of scientific writing and reporting

Practical II

CO1   Test amino acids, carbohydrates, proteins and nucleic acids.

CO2   Evaluate cell diameter by occulometer

CO3   Access permeability of cell through plasma membrane

CO4   Describe ultrastructure of cell organelles

Practical III

CO1   Estimate the protein and fat content in Cow and Buffalo milk sample

CO2   Estimate the Dissolved oxygen, Salinity and conductivity of water sample.

CO3   Describe the commercially important fishery

CO4   Identify major parts of the honeybee such as the stinger or mandibular parts along with life cycle study.

Class: T.Y.B. Sc. Zoology

Semester V

Course (Paper) Name: Principles of Taxonomy, Modern Trends in Taxonomy and study of invertebrates (USC5ZO1)

CO1   Describe the basics concept of taxonomy and classification of animals on the based-on relation to other animals by body structure, external characters and development.

CO2   Illustrate the gradual development and evolutionary history of different kinds of living organisms from earlier forms over several generations

CO3   Demonstrate the internal anatomy of various animals, biodiversity and related indices

CO4   Apply the International rules of Nomenclature to give a scientific name to animals which are found during research.

Course (Paper) Name - Hematology and Immunology (USC5ZO2)

CO1   Comprehend basic haematology and Learner will be able to identify various components of haemostatic systemss

CO2   Employ the skills necessary for the study of hematology

CO3   Describe the skills necessary for the study of immunology and realize the significant role of immune system in giving resistance against diseases.

CO4   Develop diagnostic approach in haematological disorders

Course (Paper) Name and No.: Histology, Toxicology, Enzymology and Biostatistics (USC5ZO3)

CO1   Describe the well-planned organization of tissues and cells in theorgan system.

CO2   Recall the principles of toxicology with particular emphasis on toxic responses to chemical exposures, nature and effect of toxicity and toxicity testing.

CO3   Develop introductory understanding of regulatory affairs in toxicology.

CO4   Describe basics of enzyme structure, function and variations in enzyme activity and kinetics.

Course (Paper) Name – Integumentary system, Human Osteology and Endocrinology (USC5ZO4)

CO1 State importance of epidermal and dermal derivatives and their functions.

CO2 Explain the structure, types and functions of human skeleton.

CO3 Explain basics of endocrinology.

CO4 Summarize about the endocrine glands.

Course (Paper) Name – Oceanography, Aquaculture Practices, Marketing and Finance (USCFB501)

CO1 Describe breeding techniques and skills for culture of major carps.

CO2 Comprehend hatchery and nursery management of major carps and also learn about breeding techniques, hatchery and management of fin-fish and crustaceans and shell fishes

CO3 Develop the knowledge about how to breed and rear ornamental fishes and commercially viable fish species

CO4 Explain the value of maintaining and taking sanitary precautions during the processing and packaging operations

Practical I

CO1 Identify protozoans, poriferans and significance of Platyhelminthes and nemathelminths

CO2 Identify specimens based on its general characters

CO3 Describe the various systems in earthworm

CO4 Summarize the project report based on larval forms of arthopods, molluscs and echinodermata

Practical II

CO1   Illustrate A, B, AB, O and Rh blood group

CO2   Access erythrocytes and leucocytes count from the blood sample

CO3   Examine ESR by Wintrobe method and Haemoglobin by Sahli's Method

CO4   Estimate the total serum and plasma protein by different methods

Practical III

CO1   Describe different types of mammalian tissues

CO2   Demonstrate microtomy with reference to Tissue preservation and fixation, dehydration, infiltration, paraffin embedding and block preparation, sectioning, staining.

CO3   Evaluate the effect of different pH and temperature on enzyme activity

CO4   Solve the problems based on biostatistics

Practical IV

CO1   Identify integumentary systems and its derivatives

CO2   Describe human axial and appendicular skeleton

CO3   Illustrate histological structure of endocrine glands

CO4   Estimate the plasma level in any hormone using ELISA.

Practical V

CO1   Describe function of oceanographic instruments

CO2   Identify various stages of development of carps and prawns

CO3   Describe various types of ornamental fishes and process of setting of aquarium

CO4   Summarize the various types of hatcheries

Semester VI

Course (Paper) Name- Phylum Chordata, Group Euchordata- I, Group Euchordata II and Type study – Shark (USC6ZO1)

CO1   Classify the Chordates up to class with reference to phylogeny and their special features.

CO2   Outline the taxonomy of division Gnathostomata with the distinguishing characters

CO3   Demonstrate the characteristic features and examples of class of Reptilia, Aves and Mammalia

CO4   Compare the vertebrate animal life after studying one representative animal Shark.

Course (Paper) Name – Molecular Biology, Genetic Engineering, Human Genetics and Bioinformatics (USC6ZO2)

CO1   Illustrate the intricacies of chemical and molecular processes that affect genetic material and related areas in relatively new fields of genetic engineering and biotechnology

CO2   Describe the vast array of techniques used to manipulate genes which can be applied in numerous fields like medicine, research, etc. for human benefit

CO3   Discuss the impact of changes occurring at gene level on human health and its diagnosis

CO4   Outline the computational point of view of studying the genomes

Course (Paper) Name – Developmental biology (USC6ZO3)

CO1   Review the embryo development and important processes of cell differentiation, stages of development and morphogenesis.

CO2   Illustrate the process of early and late embryonic development in animals.

CO3   Explain the post Embryonic Development and Implications of Developmental Biology.

CO4   Discuss the processes involved in embryonic development and its application.

Course (Paper) Name – Environment and Wildlife management, Bioprospecting, Zoopharmacognosy and Zoogeography (USC6ZO4)

CO1   Describe the different factors affecting environment, impact and environme management laws.

CO2   Develop wildlife habitat projects for animal protection

CO3   Compare paradigms of discovery and commercialization of biological resources ai knowledge gained by self-medication by animals

CO4   Explain how and why different animal speciesare distributed around the globe.

Course (Paper) Name: Marine resources, Post-harvest and Farm Engineering (USCFB601)

CO1   Describe the deep sea and coastal fishes and commercial potential and know about the major landingcenters of the fishes

CO2   Demonstrate crustacean and molluscan fisheries and the performance of landing centers of above fisheries

CO3   Apply the knowledge and practice the preservation and processing techniques for commercial ventures

CO4   Review the knowledge with the knowledge of fish by-products, value-added products and goodmanufacturing practices.

Practical I

CO1   Develop understanding on the diversity of life with regard to- Protochordata, vertebrata

CO2   Categorize animals on the basis of their morphological characteristics/ structures

CO3   Explain the process involved in studying biodiversity and taxonomy

CO4   Describe endoskeleton of shark

Practical II

CO1   Evaluate RNA by orcinol method and DNA by Diphenylamine method

CO2   Separate Genomic DNA Aseptic transfer techniques

CO3   Solve the problems related to Restriction endonucleases

CO4   Demonstrate the tools used in Bioinformatics.

Practical III

CO1   Identify the types of eggs, Cleavage, Blastula and Gastrula

CO2   Demonstrate the whole mounts of developmental stages of chick

CO3   Discuss the developmental stages and life cycle of *Drosophila* from stock culture

CO4   Describe histological structures of placenta

Practical IV

CO1   Apply relevant scientific principles in the area of aquatic biology

CO2   Employ scientific methodologies such as experimentation and data analysis in the area of aquatic biology

CO3   Analyze, interpret and evaluate information relevant to aquatic biology

CO4   Develop employable skills in freshwater biological water quality analysis.

Practical V

CO1   Describe marine fishes, Crustaceans and Molluscs and process of Fish dressing, filleting, prawn peeling – PUD, DV and grading

CO2   Prepare formulated feed for fish and prawn

CO3   Identify the parasitic infections in aquatic organisms

CO4   Illustrate the processes of value-added fish products and by products of fishery products

Class: F.Y.B. Sc. Mathematics
Semester I

Course (Paper) Name and No.: Calculus-I & Paper-I, Sem-I Code: USC1MT1

CO1   Define Bounded set, Supremum and Infimum of a set

CO2   Determine the convergence of sequences of real numbers

CO3   Examine the properties of sequences of real numbers

CO4   Classify the first order differential equation

Course (Paper) Name and No.: Algebra - I & Paper - II, Sem-I Code: USC1MT2

CO1   Explain the basic concepts of set theory

CO2   Examine the properties of functions and relations.

CO3   Apply well-ordering property, Induction theorems and Binomial theorem.

CO4   Analyse properties of the divisibility and congruence relations.

Course (Paper) Name and No.: Mathematics Practical-I, Sem-I Code: USC1MTP

CO1   Explain the properties of real number

CO2   Solve the first order first degree differential equation

CO3   Examine the properties of sets, functions and relations.

CO4   Solve the problems by using Induction theorems, well ordering principle, binomial theorems and congruence relations

Semester II

Course (Paper) Name and No.: Calculus-II & Paper-I, Sem-I Code: USC2MT1

CO1   Evaluate limit of a function

CO2   Examine Continuity of a function

CO3   Identify the differentiable function

CO4   Find successive differentiation

Course (Paper) Name and No.: Discrete Mathematics & Paper II, Sem-I Code: USC2MT2

CO1   Anaylze the properties of functions, relations and recurrence relations

CO2   Solve the recurrence relations.

CO3   Make use of the preliminary counting to solve the problems.

CO4   Apply the advanced counting methods to solve the problems.

Course (Paper) Name and No.: Mathematics Practical-II, Sem-I Code: USC2MTP

CO1   Evaluate limit and continuity of a function

CO2   Apply second derivative test to find local extrema

CO3   Make use of the preliminary counting to solve the problems.

CO4   Apply the advanced counting methods to solve the problems.

Class: S.Y.B. Sc. Mathematics

Semester III

Course (Paper) Name and No.: Calculus-III & Paper I USC3MT1

CO1   **Evaluate** limit of a functions of several variables

CO2   **Examine** continuity of a functions of several variables

CO3   **Identify** the differentiable functions

CO4   **Apply** multivariable calculus in optimization problems

Course (Paper) Name and No.: Algebra-III & Paper II USC3MT2

CO1   **Define** vector spaces and subspaces

CO2   **Relate** Matrices and linear transformations

CO3   **Find** basis and dimension of a vector space over $\mathbb{R}$

CO4   **Evaluate** the determinant

Course (Paper) Name and No.: Discrete Mathematics & Paper III USC3MT3

CO1   **Define** the basic concepts of graph theory

CO2   **Examine** the properties and applications of graph

CO3   **Analyze** the properties of permutation functions, Pascal's Identity, Circular Permutation and Stirling numbers.

CO4   **Apply** Pigeonhole Principle, Binomial Theorem, Inclusion and Exclusion Principle.

Course (Paper) Name and No.: Mathematics Practical-III USC3MTP

CO1   **Evaluate** limit, continuity and differentiability of functions of several variables.

CO2   **Explain** properties of vector space, linear transformation and determinant

CO3   **Classify** the different types of graphs according to their properties.

CO4   **Solve** the problems by using Pigeonhole Principle, Binomial Theorem, Inclusion and Exclusion Principle and permutations.

Semester IV

Course (Paper) Name and No.: Calculus-IV & Paper I USC4MT1

CO1   **Identify** Riemann integrability of functions

CO2   **Apply** fundamental theorem to definite integrals

CO3   **Define** Beta and Gamma functions

CO4   **Examine** convergence of Improper Integrals

Course (Paper) Name and No.: Algebra-IV & Paper II USC4MT2

CO1   **Explain** properties of inner product space

CO2   **Determine** orthogonality in inner product space

CO3   **Find** eigenvalues and eigenvectors

CO4   **Identify** diagonalizable matrix

Course (Paper) Name and No.: Ordinary Differential Equation & Paper III USC4MT3

CO1   **Recall** the methods to solve the first order differential equations.

CO2   **Solve** second order linear differential equations by using variation of parameter, reduction method and method of undetermined coefficients

CO3   **Apply** the power series method to find the solution of second order differential equations.

CO4   **Solve** second order differential equations by using Laplace Transform

Course: Mathematics Practical-IV Course Code: USC4MTP

CO1   **Determine** properties of Riemann integration , indefinite and improper integrals

CO2   **Explain** properties of inner product space, eigenvalues , eigenvectors and diagonalizable

CO3   **Apply** power series method and different techniques to find the solution of second order differential equations.

CO4   **Solve** the differential equations by using Laplace Transform

Class: F.Y.B. Sc. Physics

Semester I

Course (Paper) Name and No.: Classical Physics, Basic Electrodynamics, Thermodynamics, Physics 1 USC1PH1

CO1   Summarise properties of matter, vectors algebra, laws of thermodynamics.

CO2   Apply the laws of thermodynamics to formulate the relations necessary to analyse a thermodynamic process, laws of vector algebra, elasticity, fluid dynamics concepts in various physical situations.

CO3   Explain crystal system, crystal planes and its direction, different coordinate system and interconversion between them, mechanical properties of matter and fluid with its application,

CO4   Solve sums based on miller indices, Bravais lattices, vector algebra, elasticity, fluid dynamics, thermodynamics.

Course (Paper) Name and No.: Nuclear Physics & Analog Electronics, Physics 2 USC1PH2

CO1   Explain nuclear reactions, interactions between subatomic particles, construction & working of gas filled nuclear detectors, digital electronic circuits, number systems, AC Circuits & AC Bridges

CO2   Solve numerical problems related to Binary Addition & subtraction, Nuclear Reactions, response of purely resistive, capacitive & inductive circuits, RC circuit, LR circuit and LCR circuits to an AC Signal using phasor diagrams and AC Bridges.

CO3   Evaluate the balancing conditions for Maxwell's Bridge, de-Sauty's Bridge, Wien Bridge, Hay Bridge.

CO4   Determine the equations of total current(I) impedance(Z) & phase angle for purely resistive, capacitive & inductive circuits, RC circuit, LR circuit and LCR circuit using phasor diagram.

Course Name and No.:   Practical USC1PHP

CO1   Make use of measuring devices such as Digital Multimeter, Vernier Calliper, Micrometre Screw Gauge, Travelling Microscope, spectrometer.

CO2   Construct circuits using Resistors, Inductors, Capacitors, Voltmeter, Ammeter, LDR, transformers and logic gates

CO3   Measure different mechanical properties of Solids like the Moment of Inertia, Modulus of Elasticity, Coefficient of Viscosity, temperature coefficient of resistance of Thermistor and Joule's Constant.

CO4   Determine capacitance, inductance, frequency of AC mains, lattice parameters and interplanar spacing.

Semester II

Course (Paper) Name and No.: Optics, Mathematical physics, Wave Motion, Physics 1 USC2PH1

CO1   Apply lens maker equation, concepts of differential equation in circuits, second law of thermodynamics to Heat Engines.

CO2   Deduct current, charge in LR, RC circuit in terms of equation and graph, equivalent focal length, cardinal points for thin and thick lens, work done in Carnot cycle, efficiencies of heat engines.

CO3   Discuss natural physical processes related to light waves, lens system, aberration, Heat Engines, Second law of thermodynamics.

CO4   Solve numerical problems related to homogenous and inhomogenous equations, lens, Aberration, Carnot Cycle, Carnot heat Engine & other Heat Engine.

Course (Paper) Name and No.: Modern Physics, DC Circuits & Digital Electronics, Electrostatics, Magnetostatics, Geophysics, Physics 2 USC2PH2

CO1   Explain the wavelike behaviour of a particle, the concept of matter wave and the distribution of Energy for a Black body radiator.

CO2   Solve numerical problems based on matter waves, D. C. Circuits, Network theorems, Electric field and magnetic field.

CO3   Analyse electric network circuits using Thevenin's theorem, Norton theorem, Superposition theorem, Reciprocity theorem and Maximum Power Transfer theorem..

CO4   Discuss on rectifier circuits, Capacitor Filter circuits, Inductor filter circuits, CLC or Pi Filter circuits and voltage regulator circuits.

Course Name and No.:   Practicals USC2PHP

CO1   Utilise Optical Instruments such as the Spectrometer, Prism, Lenses for finding Optical properties like the Refractive Index of the material of the Prism, equivalent focal length.

CO2   Determine moment of inertia & acceleration due to gravity.

CO3   Justify Norton's & Thevenin's theorem, Zener diode, Bridge rectifier as voltage regulator, Transistor characteristics.

CO4   Design circuits using Diodes, transistors, resistors, transformers.

Class: S.Y.B. Sc. Physics

Semester III

Course (Paper) Name and No.: Mechanics and Thermodynamics Physics-1 USC3PH1

CO1   explain the laws of conservation of momentum & energy, compound pendulum, damped & forced harmonic oscillator, thermodynamic processes, Construction & Working of different types of Heat Engines and the second law of thermodynamics.

CO2   formulate equations for the motion of the rocket, conditions for forced & damped harmonic oscillator, time period of compound pendulum, efficiency and work done of Heat Engines.

CO3   solve numerical problems based on laws of conservation of momentum & energy, compound pendulum, damped harmonic oscillator, forced harmonic oscillator, heat engines.

CO4   distinguish between thermodynamic processes, Otto Engine & Diesel Engine, Simple Pendulum & Compound Pendulum, Damped Oscillations & Forced Oscillations.

Course (Paper) Name and No.: Mathematical Physics, Analog Electronics Physics 2 USC3PH2

CO1   Solve vector calculus and Fundamental Theorem of Line Integrals, Green's Theorem, Stokes' Theorem, or Divergence Theorem to evaluate integrals,

CO2   determine the operating point, stability factor for different transistor biasing methods, frequency of oscillator, voltage gain of opamp in different applications

CO3   estimate the mathematical relation between cylindrical & spherical coordinate system.

CO4   design basic circuits using Op-amp , transistor , oscillator

Course (Paper) Name and No.: Material Physics & Geophysics Physics-3 USC3PH3

CO1   explain the factors affecting Acoustics of buildings, Principle of operation of LASER and Propagation of light through Optical Fiber, variation of Physical and Chemical properties in the interior of the Earth, Continental drift, Plate tectonics, Types of plates and Cause of Earthquake.

CO2   solve the numerical problems based on Numerical aperture, Acoustics of Buildings, Intensity of Laser and Miller indices.

CO3   classify the crystals on the basis of the crystal system and Bravais lattices.

CO4   compare the materials on the basis of Electrical conductivity and relative magnetic permeability.

Course Name and No.: Practicals USC3PHP

CO1   experiment with bridge rectifiers, oscillators, Ballistic galvanometers.

CO2   inspect Stefan's law, Brewster's law, e/m by Thomson's method, passive filters, applications of op-amp, CE amplifier, NAND & NOR as Universal Building Block

CO3   construct electronic circuits using resistor, capacitor, diode, transistor, IC-741 (Op-Amp), logic gates.

CO4   estimate physical constants related to solids.

Semester IV

Course (Paper) Name and No.: Wave Optics Physics-1 USC4PH1

CO1   explain the Construction and Working of Michelson's Interferometer & Febry-Perot Interferometer, Fresnel's class of Diffraction, Fraunhofer class of Diffraction and the phenomenon of polarization.

CO2   solve numerical problems related to Michelson's Interferometer & Febry-Perot Interferometer, Fresnel's Diffraction, Fraunhofer Diffraction and Brewster's law

CO3   formulate equations for the wavelength of light, difference in wavelength of light, refractive index of gases using Michelson's Interferometer & Febry-Perot Interferometer, separation between diffraction minima & maxima in Fresnel's class of Diffraction and Fraunhofer class of Diffraction.

CO4   distinguish between the Michelson's Interferometer & Febry-Perot Interferometer, Fresnel's class of Diffraction and Fraunhofer class of Diffraction and unpolarized light, plane polarized light, circularly polarized light & elliptically polarized light.

Course (Paper) Name and No.: Quantum Mechanics, Physics 2 USC4PH2

CO1   Explain postulates of quantum mechanics, operators, expectation values in quantum mechanics and Schrodinger's equation.

CO2   apply boundary conditions to calculate the transmission and reflection coefficients for free & bound states.

CO3   Solve the Schrodinger steady state equation in free and bound state.

CO4   elaborate Schrodinger's equation to radioactive decay and harmonic oscillator.

Course (Paper) Name and No.: Digital Electronics, Radio Communication, Physics-3 USC4PH3

CO1   explain Flip-Flop, Shift registers, counters, 8085 microprocessor architecture and modulation techniques used in wireless communication system

CO2   solve the numerical problems based on the conversion of numbers in different Number Systems.

CO3   elaborate shift registers and counter circuits using Flip-Flop and logic gates.

CO4   design a programme logic for an 8085 microprocessor using various 8085 instructions.

Course Name and No.:   Practicals USC4PHP

CO1   determine physical constants of solids, the Resolving power of telescope & grating, wavelength of the monochromatic light, refractive index.

CO2   design & construct MS-JK flip flop (IC 7476), Latch (IC 7400/IC 7402) , 8:3 Priority Encoder (IC 74LS148) and 3:8 Decoder (IC 74LS138), shift register, oscillator, Half adder and full adder using EX-OR gate, Op-amp as a Differentiator and Integrator.

CO3   compose programme using 8085 microprocessor

CO4   Experiment with IC-7486, IC-7408, IC-7476, IC-7400, IC-7402, IC-74148, IC-74138, IC-74194, IC-741, spectrometer, telescope.

Class: F.Y.B. Sc. Botany
Semester I

Course (Paper) Name and No.: Plant Diversity I USC1BO1

CO1   Describe general characteristics of Bacteria, Lichens, Class Cyanophyceae and Chlorophyceae.

CO2   Explain life cycles of *Nostoc, Spirogyra, Aspergillus, Rhizopus* and *Riccia*

CO3   Differentiate between the different plant groups namely Algae, Bryophyta and Fungi.

CO4   Classify *Nostoc*, *Spirogyra, Aspergillus, Rhizopus, Riccia* and Lichens

Course (Paper) Name and No.: Form and Function I USC1BO2

CO1   Describe intra and inter-locus gene interactions, epistasis and chromosomal method of sex determination, structure of primary body of dicots and monocots

CO2   Explain mitosis, the types and structure of Nucleic acids and ultrastructure of chloroplast and mitochondria

CO3   Differentiate between eukaryotic and prokaryotic cells and the ultrastructure of mitochondria and chloroplast.

CO4   Distinguish between simple and complex tissues, different types of vascular bundles, primary body of dicots and monocots and different types of epistasis.

Course (Paper) Name and No.: Plant Diversity I and Form and Function I USC1BOP

CO1   Identify *Nostoc, Spirogyra, Aspergilus, Riccia,* and different types of lichens and vascular bundles.

CO2   Prepare slides to show gram staining, structure of dicot and monocot root and stem and an idiogram from photomicrograph.

CO3   Construct a histogram, pie chart and frequency polygon.

CO4   Calculate mean, median, mode, standard deviation.

Semester II

Course (Paper) Name and No.: Plant Diversity I   USC2BO1

CO1 Describe general characteristics and economic importance of families Cruciferae, Apocynaceae, Euphorbiaceae and Amaryllidaceae and economic importance of Gymnosperms

CO2 Explain the different systems of classification and life cycles of *Nephrolepis* and *Cycas*.

CO3 Classify *Nephrolepis, Cycas* and families Cruciferae, Apocynaceae, Euphorbiaceae and Amaryllidaceae

CO4 Differentiate between the different plant groups namely Pteridophytes, Gymnosperms and Angiosperms and different types of fossils.

Course (Paper) Name and No.: Form and Function I USC2BO2

CO1 Describe mechanism of enzyme action, enzyme inhibition, kinetics and classification of enzymes, mechanism of stomatal movements, guttation, wilting and enzymes used in gene cloning.

CO2 Explain the concept of ecosystem, food chain, food web, energy flow and edaphic factors.

CO3 Differentiate between different types of enzymes, transpiration, cloning vectors biotic interactions and types of soil.

CO4 Compare primary and secondary metabolites.

Course (Paper) Name and No.: Plant Diversity I and Form and Function I, USC2BOP

CO1 Identify *Nephrolepis, Cycas*, families Cruciferae, Apocynaceae, Euphorbiaceae, Amaryllidaceae and different types of biotic interactions.

CO2 Prepare slides to show internal structure of *Nephrolepis, Cycas* and stomata.

CO3 Determine activity of enzymes lipase and amylase, effect of pH on Anthocyanin pigments, organic content of soil and enzyme immobilization.

CO4 Differentiate between tannins, alkaloids and terpenoids.

Class: S.Y.B. Sc. Botany

Semester III

Course (Paper) Name and No.: Plant Diversity II USC1BO1

CO1   Describe general characteristics of Class Cyanophyceae, Chlorophyceae, Phycomycetae and Hepaticae

CO2   Explain life cycles of *Nostoc, Spirogyra, Saprolegnia, Rhizopus* and *Riccia*

CO3   Differentiate between the different plant groups namely Algae, Bryophyta and Fungi.

CO4   Classify *Nostoc*, *Spirogyra, Saprolegnia, Rhizopus* and *Riccia*

Course (Paper) Name and No.: Form and Function II USC1BO2

CO1   Describe concepts in Mendelian, non-Mendelian genetics, epistasis and multiple allelism.

CO2   Explain the concept of ecosystem, food chain, food web, and energy flow.

CO3   Differentiate between eukaryotic and prokaryotic cells and the ultrastructure of cell wall, cell membrane, mitochondria, chloroplast and endoplasmic reticulum.

CO4   Distinguish between the features of different types of aquatic and terrestrial ecosystems

Course (Paper) Name and No.: Plant Diversity II and Form and Function II USC1BOP

CO1   Identify *Nostoc, Spirogyra, Saprolegnia, Riccia,* Hydrophytes, Mesophytes, Xerophytes, Halophytes and different examples of biotic interactions.

CO2   Prepare slides to show gram staining, cell inclusions, mitochondria from suitable material and an idiogram from photomicrograph.

CO3   Construct a histogram, pie chart and frequency polygon.

CO4   Calculate mean, median, mode, standard deviation.

Course (Paper) Name and No.: Current Trends in Plant Sciences I USC2BO1

CO1   Describe general characteristics and economic importance of families Cruciferae, Apocynaceae, Euphorbiaceae and Amaryllidaceae and economic importance of Gymnosperms

CO2   Explain inflorescence morphology and life cycles of *Nephrolepis* and *Cycas.*

CO3   Differentiate between the different plant groups namely Pteridophytes, Gymnosperms and Angiosperms.

CO4   Classify Nephrolepis, Cycas and families Cruciferae, Apocynaceae, Euphorbiaceae and Amaryllidaceae

Semester IV

Course (Paper) Name and No.: Plant Diversity II USC2BO1

CO1   Describe general characteristics and economic importance of families Cruciferae, Apocynaceae, Euphorbiaceae and Amaryllidaceae and economic importance of Gymnosperms

CO2   Explain inflorescence morphology and life cycles of *Nephrolepis* and *Cycas.*

CO3   Differentiate between the different plant groups namely Pteridophytes, Gymnosperms and Angiosperms.

CO4   Classify Nephrolepis, Cycas and families Cruciferae, Apocynaceae, Euphorbiaceae and Amaryllidaceae

Course (Paper) Name and No.: Form and Function II USC2BO2

CO1   Describe mechanism of enzyme action, enzyme inhibition, kinetics and classification of enzymes.

CO2   Explain concepts of primary and secondary metabolites and Write down the sources, parts used, active constituents and medicinal uses of adulsa, tulsi, ginger, turmeric, sandalwood and aloe.

CO3   Differentiate between different tissue systems, epidermal appendages and primary structure of Dicots and Monocots.

CO4   Compare water potential, solute potential, matric potential and pressure potential

Course (Paper) Name and No.: Current Trends in Plant Sciences I

CO1   Describe the different garden features.

CO2   Understand the concept of different types of gardens, formal and informal.

CO3   Describe plant tissue culture with reference to organogenesis, totipotency, embryo, root, meristem and another culture.

CO4   Understand the concept of gene cloning with reference to enzymes and vectors used in gene cloning

Class: M.Sc. I Chemistry

Semester I

Course (Paper) Name and No.: Physical Chemistry PSC1PC1

CO1   Prove Maxwell relations and their significance and applications to ideal gases, Joule Thomson experiment, Joule Thomson coefficient, and inversion temperature. Apply the Third law of Thermodynamics to find out absolute entropy

CO2   Make use of quantum mechanics for Particle waves and Schrödinger wave equation, wave functions, properties of wave functions, Normalization of wave functions, orthogonality of wave functions. Particle in a one, two- and three-dimensional box

CO3   Define, understand basic terms of Chemical Dynamics i.e. rate constant, order of reaction, molecularity of reaction also compare Composite Reactions and Polymerization reactions

CO4   Make use of Colloids and Surface Phenomena in daily applications

Practical's PSC1PCP

CO1   Know the principles of different instruments like Potentiometry, Conductometry, pH Metry.

CO2   Determine the heat of solution of sparingly soluble acid and identify the reaction between acetone and iodine.

Course (Paper) Name and No.: Physical Chemistry, PSC2PC2

CO1   Explain Bioenergetics, Real solutions and Fugacity of real gases also show graphical representations of BET isotherms

CO2   Prove expressions for the total wave function for 1s,2s, 2p and 3d orbitals of hydrogen and aapplication of the Schrödinger equation to two electron system

CO3   Explain terms involved in Chemical Kinetics and Molecular Reaction Dynamics. Elementary Reactions in Solution, Kinetics of reactions catalysed by enzymes -

Michaelis-Menten analysis, Lineweaver-Burk and Eadie Analyses, Inhibition of Enzyme action.

CO4   Apply Photochemistry to solve NET, SET GATE Problems.

Practical's PSC1PCP

CO1   Know principles of different instruments like Potentiometry, Conductometry, pH Metry and colorimeter

CO2   Make use of graphical representation to identify Shape of Orbitals.

Course (Paper) Name and No.: Inorganic Chemistry, PSC1IC1

CO1   Explain theories of bonding, hybridization, resonance concept, MOT for Polyatomic species and Higher boranes, carboranes, metalloboranes and metallocarboranes, metal carbonyls and halide clusters.

CO2   Explain The concept of band theory, Fermi level, K-Space and Brillouin Zones, Defects and its Classification of. and Preparative methods of inorganic solids & nano materials.

CO3   Construct Group Multiplication Tables, Character tables using concept of Molecular Symmetry and Group Theory.

CO4   Determine electronic parameters such as Δ, B, C, Nephelauxetic ratio, formation constants of metal complexes and Characterize coordination compounds using techniques like thermal studies, Conductivity measurements, electronic spectral and magnetic measurements, IR, NMR and ESR spectroscopic, calculate number of defects and average energy required for defect.

Practical's PSC1ICP

CO1   Prepare various inorganic complexes such as Bis-(tetramethylammonium) tetrachloroCuprate (II) (Me4 N) 2[CuCl4],Tetramminemonocarbanato Cobalt (III) Nitrate, Bis (ethylenediammine) Copper (II) Sulphate, Hydronium dichlorobis(dimethylglyoximato) etc.

CO2   Determine the electrolytic nature of inorganic compounds

CO3   Apply Slope intercept method for determination of equilibrium constants for Fe^{+3}/

SCN- system.

CO4   Analyze the inorganic complex for percentage of metal and ligand.

Course (Paper) Name and No.: Inorganic Chemistry, PSC2IC2

CO1   Recall Organometallic Chemistry of Transition metals, Eighteen and sixteen electron rules, Preparation and property's structure and bonding of the Organometallic compounds

CO2   Explain Photochemical Reactions, Ligand substitution reactions of: Octahedral complexes, Square planar complexes, trans-effect, its theories and applications. Redox reactions: inner and outer sphere mechanisms, stereochemistry of substitution reactions of octahedral complexes

CO3   Explain Bioinorganic Chemistry related to biological oxygen carriers; hemoglobin, hemerythrene and hemocyanine- structure of metal active center and differences in mechanism of oxygen binding, Copper containing enzymes, Nitrogen fixation Metal ion transport and storage, Medicinal applications of cis-platin and related compounds.

CO4   Discuss the implication of toxic metallic species radioactive materials on environment and biological system using case studies.

Practical's PSC2ICP

CO1   Analyze ores and alloys using volumetric and gravimetric analysis.

CO2   Estimate percentage of metals in the ore and alloy

CO3   Apply the potentiometric method for redox titrations of Fe, Cu etc.

Course (Paper) Name and No.: Organic Chemistry Practical, PSC1OC1

CO1   Understand the types of reaction and their applications

CO2   Summarize the various aspects of aromaticity, aliphatic and aromatic nucleophilic substitution reactions with their mechanism and examples.

CO3   Apply the concept of Configurational descriptors (R,S nomenclature) to chiral centres in Organic compounds

CO4   Predict the mechanism, selectivity, importance and applications of oxidizing and reducing agent

Course (Paper) Name and No.: Organic Chemistry Practical, PSC1OCP

CO1   Plan preparation of organic compounds

CO2   Demonstrate the skill of purification of organic compounds by recrystallization and sublimation methods.

CO3   Apply the thin layer chromatography technique to check the purity of the synthesized product.

CO4   Can Sketch the structure of organic compounds using software Chem Biodraw.

Course (Paper) Name and No.: Analytical Chemistry PSC1AC1

CO1   Explain the concept of data domain, performance characteristics of an instrument/method, total quality management, quality standards for laboratories, quality audits, quality reviews and environmental toxicology.

CO2   Discover the applications of UV-Visible spectroscopy, IR spectroscopy, Differential scanning calorimetry.

CO3   Identify the need of automation in chemical analysis, safety measures in laboratory, need of accreditation of laboratories and GLP.

CO4   Interpret the data based on calculations and statistical tests.

Course (Paper) Name and No.: Analytical Chemistry Practical PSC1ACP

CO1   Demonstrate the titration skills for the analysis of samples
       of a diverse variety

CO2   Apply the statistical methods for data analysis

CO3   Analyze the measured data based on Chemical principles

CO4   Measure the characteristics of ion exchange resins

Semester II

Course (Paper) Name and No.: Organic Chemistry, PSC2OC2

CO1   Explain the Generation of carbanion, enolate, enamine with their alkylation & acylation reaction and name reactions with their mechanism.

CO2   Illustrate mechanism, stereochemistry, applications and importance of name reactions and rearrangements.

CO3   Explain the role of reagents in organic synthesis.

CO4   Interpret the structure of organic compounds using combined of spectral techniques.

Practical's Organic Chemistry Practical, PSC2OCP

CO1   Identify the chemical type of components present in a binary mixture of an organic compound.

CO2   Apply skills in the separation and qualitative analysis of organic compounds of binary mixtures by microscale technique.

CO3   Make use of crystallization, sublimation and distillation for purification of the organic compounds.

CO4   Demonstrate the practical aspects in the preparation of the organic compound derivatives.

Course (Paper) Name and No.: Analytical Chemistry PSC2AC2

CO1   Translate the theoretical principles of advanced separation techniques, spectroscopic techniques, radioanalytical techniques, electroanalytical techniques into applications.

CO2   Explain the working principles of surface analytical techniques such as SEM, ESCA, Auger spectroscopy and ICP-AES

CO3   Compare the different ion sources and mass analysers in mass spectroscopy

CO4   Determine the electrical quantities such as charge, current, potential using Electroanalytical methods

Course (Paper) Name and No.: Analytical Chemistry Practical PSC2ACP

CO1   Demonstrate the operational skills on the selected instruments and retrieve information

CO2   Develop a sense of time management, safe use of chemicals and environmental safety

CO3   Measure the physical property of the samples and relate it with quantity

CO4   Construct the graphs based on the measurements, interpretation and calculations using experimental data.

Class: M.Sc. II Analytical Chemistry

Semester III

Course (Paper) Name and No.: Analytical Chemistry I PSC3QAC

CO1   Explain the regulatory affairs in pharmaceutical industries, GMP and GLPregulations and role and responsibilities of analyst in quality control.

CO2   Describe variety of analytical methods to separate, characterize and analyze the samples of various matrices

CO3   Measure the uncertainty in results and signal to noise ratio for improving theresults.

CO4   Use sampling techniques, pretreatment techniques, performance criteria, validation parameters suitable to selected analytical methods.

Practical's PSC3QAP

CO1   Explain the theoretical principle of the experiment

CO2   Use technical and manipulative skills in instrumental methods of analysis

CO3   Make use of instrumental methods for analysis of samples

CO4   Analyze the data graphically to express relations between two quantities

Course (Paper) Name and No.: Analytical Chemistry II PSC3AIT

CO1   Explain the theoretical concept and working principle of spectroscopic and electroanalytical techniques

CO2   Write the applications of advanced instrumental techniques

CO3   Classify the advanced instrumental techniques based on their workingprinciple

CO4   Describe the principle and working of instruments, and processes

Practical's PSC3AIP

CO1   Apply laboratory skills in analysis of pharmaceuticals, cosmetics andbiological samples

CO2   Intreprete results by calculation and graph

CO3   Compare the results with reference values to calculate percentage error

CO4   Prepare laboratory reports

Course (Paper) Name and No.: Analytical Chemistry III PSC3BCF

CO1   Summarize bioanalytical techniques

CO2   Construct reasonable mechanisms for immunological reactions

CO3   Apply the physical and chemical methods for analysis of variety of natural food and processed food

CO4   Distinguish food preservation and processing methods

Practical's PSC3BCP

CO1   Use appropriate pretreatment or extraction method for analysis

CO2   Compare the results with recommended levels/permissible limits.

Determine specific nutrients in different food samples

Interpret the experimental results

Course (Paper) Name and No.: Analytical Chemistry IV

CO1   Memorize air/water pollution regulations, quality requirements and permissible limits

CO2   List industrial pollutants and their impact on environment

CO3   Describe variety of industrial pollutants

CO4   Apply analytical methods for analysis of air/water/soil pollution

Practical's PSC3ENP/ PSC3POP

CO1   Determine percent composition of ores and alloys

CO2   Evaluate chemical parameters of water samples

Select suitable method for analysis of metallurgical samples

Interpret results to define the quality of the samples

Course (Paper) Name and No.: Analytical Chemistry V PSC3POA

CO1   Define the role of analyst in quality control and forensic laboratories

CO2   Classify drugs, dosage forms and pharmaceutical formulations

CO3   Select appropriate chemical and instrumental methods, for the pharmaceutical, cosmetics and forensic analysis

CO4   Apply chemical, instrumental, biological, microbiological and enzymatic methods for pharmaceutical assay.

Semester IV

Course (Paper) Name and No.: Analytical Chemistry I PSC4QAC

CO1   Explain principles of separation methods such as membrane separation, electrophoresis and solvent extraction

CO2   Apply separation, analysis and standardization methods for analysis

CO3   Employ the methods and chemicals that are benign for human health and the environment, which include principles of green chemistry

CO4   Make use of separation methods to analyze variety of samples

Practical's PSC4REM

CO1   Outline the principles of the quantitative measurements using instrumentalmethods

CO2   Make use of suitable methods of sample preparation and pre-treatment

CO3   Select the calibration parameters for the instrument to obtain accuracy in measurements.

CO4   Apply the instrumental techniques for analysis of commercial samples

Course (Paper) Name and No.: Analytical Chemistry II PSC4AIT

CO1   Explain the principles of 1-D, 2-D NMR, MRI imaging, mass spectroscopy, Raman spectroscopy, thermal and radiochemical methods.

CO2   Select the radioanalytical and thermal methods for the analysis

CO3   Interpret NMR and Mass spectra for molecular identification

CO4   Distinguish hyphenated techniques on the basis of the possible hyphenationsand role of interface.

Practical's PSC4AIP

CO1   Make use of standard operating procedures and related references

CO2   Select the appropriate method to solve the analytical problem associated with the quality testing.

CO3   Compare the results with the reference values

CO4   Develop hands-on experience of quality control assays/tests of the commercial samples

Course (Paper) Name and No.: Analytical Chemistry III PSC4STA

CO1   Illustrate the metallurgical process and their impact on environment

CO2   Identify the methods used for analysis of polymers and plastics and their impact on environment

CO3   Apply the knowledge of effluent parameters, permissible limits and recovery methods to recycle and reuse of treated waste

CO4   Propose appropriate treatment techniques for industrial effluent and solid waste management

Practical's PSC4STP

CO1   Demonstrate the safety and environmental protection procedures

CO2   Make use of valid sampling technique for food and environmental samples having diverse variety

CO3   Apply analytical methods used for quantifying the composition and reactions of food components

CO4   Interpret and report data derived from chemical experiments/analysis in a meaningful way

Course (Paper) Name and No.: Analytical Chemistry IV PSC4IPR

CO1   Define various terminologies related to IPR

CO2   Explain the role of law in the violation of IPR

CO3   Summarize the various models of cheminformatics

CO4   Apply the knowledge of cheminformatics to predict the properties of compounds, structures and drug designing

Practical's PSC4IPP/ PSC4REP

CO1   Analyze the print and digital resources critically to formulate the research problem, argue and justify the statements

CO2   Apply the existing methodologies or develop a new methodology to address the research problem

CO3   Interpret the results and structure it to communicate via dissertation, and oral presentation by following ethical guidelines

CO4   Build an experience on the analytical chemistry problems in a professional environment at industry or a professional laboratory

Course (Paper) Name and No.: Analytical Chemistry V PSC4QAP

CO1   Explain the importance of different types of print and digital resources forgap analysis and data collection

CO2   Analyze scientific data by statistical and graphical methods

CO3   Interpret the results and its communication through lab reports, research papers and oral presentations following ethical practices

CO4   Design/propose methodologies preferably with green and safe approach to conduct research

Class: M.Sc. II Organic Chemistry

Semester III

Course (Paper) Name and No.: Organic Chemistry I PSC3TOC0

CO1   Explain the structure, generation, stability and reactions of organic reactive intermediates and importance of neighboring group participation, role of FMOs.

CO2   Apply the principles of photochemistry to carbonyl compounds, olefins, arenes and radical reactions.

CO3   Identify pericyclic reactions and describe cycloaddition reactions, electrocylic reactions and sigmatropic rearrangements

CO4   Analyze conformation of medium size ring, fused ring, bridge ring, steroids and reactivity of addition, elimination, rearrangement and reduction with stereoselective and stereospecific reactions.

Practical's PSC3NPP0 & (PSC3MBP0 or PSC3BIP0)

CO1   Demonstrate the skills in organic preparations required for pursuing a career in the pharmaceutical, chemical industry, research etc.

CO2   Make use of column chromatography, crystallization steam and vacuum distillation for purification of the organic compounds

CO3   Identify the prepared organic compounds by Thin Layer Chromatography

Course (Paper) Name and No.: Organic Chemistry II PSC3SOC0

CO1   Summarize generation, stability, structure, stereochemical aspects of free radicals, its characteristic reactions and use in organic synthesis.

CO2   Explain preparation of organometallic compound, its applications, mechanism and regiochemistry of reactions involving metals/non-metals in organic synthesis.

CO3   Compare between enamines and enolates, methods of preparation, applications with stereochemical aspects in synthetic reactions

CO4   Predict the products of name reactions, domino reactions, click reactions, multicomponent reactions and describe the mechanisms showing how the products are formed

Practical's PSC3TOP0 & PSC3SOP0

CO1 Demonstrate the practical aspects in the preparation of the organic compounds and their derivatives

CO2 Identify the chemical type of components present the in ternary mixture of organic compounds.

CO3 Apply skills in detection, identification and separation of organic compounds of ternary mixtures by microscale technique.

Course (Paper) Name and No.: Organic Chemistry III PSC3NPS0

CO1 Explain the occurrence, structural features, and biological importance of natural products.

CO2 Draw conclusion based on evidence for structure elucidation and synthesis of natural products.

CO3 Explain multistep synthesis of natural products.

CO4 Interpret the data for the structure elucidation of organic compounds based on UV, IR, ^{1}HNMR and ^{13}C-NMR.

Course (Paper) Name and No.: Organic Chemistry IV PSC3MBG0

CO1 Demonstrate the knowledge of the twelve principles of Green Chemistry which they can practice to a range of work places for a safer, less toxic and healthier environment.

CO2 Explain the basic terms used in medicinal chemistry, the pharmacokinetics of drug, drug structure activity relationship, physical chemical parameters of drug and procedures in drug design.

CO3 Apply skills required for drug design, development of modern methods of synthesis required for employment in the pharmaceutical industries.

CO4 Build the biogenesis and biosynthesis of natural products by acetate pathway, shikimate pathway and mevalonate pathway

Course (Paper) Name and No.: Organic Chemistry V Bioorganic chemistry PSC3BIC0

CO1 Summarize amino acids, peptides, proteins, and nucleic acids and chemical synthesis of oligonucleotides.

CO2 Explain importance of enzymatic reactions and factors affecting enzyme kinetics.

CO3 Relate the importance of enzymes in the synthesis of organic compound.

CO4 Explain structure, mechanism of action and biomodelling studies of co-enzyme.

Semester IV

Course (Paper) Name and No.: Organic Chemistry I PSC4NPH0

CO1 Explain occurrence, classification, structural and stereochemical features of steroids, insect pheromones, insecticides, vitamins and their biological role in life related processes.

CO2 Plan the synthesis of biologically important steroids, vitamins, antibiotics insecticides and pheromones.

CO3 Construct the names of monocyclic/bicyclic/tricyclic heterocyclic compounds by IUPAC nomenclature and replacement nomenclature

CO4 Apply fundamentals of heterocyclic reactivity and synthesis skills required for heterocyclic compounds in research and industry.

Practical's PSC4TOP0 & PSC4SOP0

CO1 Plan the synthesis of organic compounds.

CO2 Make use of thin layer chromatography and physical constant to know the purity of organic compounds

CO3 Apply principles of purification techniques such as recrystallization and distillation for purification of organic compounds.

CO4 Compare spectral data of reactant and product and explain mechanism of reactions and MSDS of chemicals.

Course (Paper) Name and No.: Organic Chemistry II PSC4IPR0

CO1 Define various terminologies related to IPR

CO2 Explain the role of law in the violation of IPR

CO3 Summarize the various models of cheminformatics

CO4 Apply the knowledge of cheminformatics to predict the properties of compounds, structures and drug designing

Practical's PSC4NPP0 & (PSC4IPP0 or PSC4RMP0)

CO1   Interpret spectral data like FT-IR, ^{13}C NMR, $^{1}HNMR$, UV-Visible spectrum and Mass spectrum for structure elucidation of organiccompound

CO2   Analyze the print and digital resources critically to formulate the research problem, argue and justify the statements

CO3   Apply the existing methodologies or develop a new methodology to address the research problem

CO4   Interpret the results and structures it to communicate via dissertation, and oral presentation by following ethical guidelines

Course (Paper) Name and No.: Organic Chemistry III PSC4RMT0

CO1   Explain the importance of different types of print and digital resources for gap analysis and data collection

CO2   Design/propose methodologies preferably with green and safe approach toconduct research

CO3   Analyze scientific data by statistical and graphical methods

CO4   Interpret the results and its communication through lab reports, research papers and oral presentations following ethical practices

Course (Paper) Name and No.: Organic Chemistry

CO1   Student will learn every aspect of publication of research paper such as terms associated with journal, referencing and library resources.

CO2   Student will get conversant with the methods of data analysis and various softwares employed for it.

CO3   Students will get knowledge of actual writing scientific papers.

CO4   Students will get information of the safety and ethical handling of chemicals

Project Evaluation

CO1   Student will actually get involved in research work.

CO2   Student will understand the analysis of data generated by their research work.

CO3   Student will learn how to present research work.

Class: M. Sc. I Microbiology

Semester I

Course (Paper) Name and No.:I : Cell Biology

CO1   Define principles of membrane transport, ion channels, and electric properties of the membrane.

CO2   Demonstrate the understanding of various microscopic techniques such as electron microscopy, confocal microscopy, phase contrast microscopy, etc. used for the study of cells.

CO3   Construct the various cell signaling pathways under different conditions.

CO4   Explain the mechanism and significance of Apoptosis in cell cycle.

Course (Paper) Name and No.: II: Microbial Genetics

CO1   Explain the Post transcriptional modification

CO2   Distinguish the gene expression and its regulation found in both prokaryotic as well as eukaryotic cell

CO3   Explain the importance of DNA recombination and repair

CO4   Compare the difference between the cytoplasmic and genomic inheritance

Course (Paper) Name and No.: III: Microbial Biochemistry I

CO1   Solve problems based on expression of concentrations of solutions, pH, buffer capacity and ionic strength.

CO2   Recall structure, properties and functions of amino acids, proteins, lipids and glycoconjugates.

CO3   Illustrate the pathway for utilization of one-carbon compounds and two-carbon compounds.

CO4   Analyze processes of extracellular protein secretions and translocations of folded proteins.

Course (Paper) Name and No.: IV: Medical Microbiology &Immunology

CO1   Explain transmission, pathogenesis, and treatment of various infections of gastrointestinal, skin, and emerging infections.

CO2   Compare different epidemiological principles in disease prevention and control.

CO3   Justify the molecular basis of immunoglobulin diversity, physiological and immunological barriers in adaptive and innate immune response.

CO4   Discuss immune response to bacterial and viral infections & methods of evasion of immune response by pathogens.

Semester II

Course (Paper) Name and No.:I: Virology

CO1   Explain the life cycles of pathogenic animal viruses including influenza; hepatitis B; herpes simplex; varicella-zoster;smallpox etc.

CO2   Determine the factors contributing to the pathogenesis of viruses

CO3   Clarify the different types of plant viruses causing plant diseases

CO4   Distinguish the structure and replication cycle of T4 and T7 phage

Course (Paper) Name and No.:II: Microbial Genetics-II

CO1   Demonstrate the role of physical and chemical mutagens using replica plate technique

CO2   Compare between the Southern & Northern blotting

CO3   Test the potential chemicals for mutagenesis by Ame's method

CO4   Design a primer for DNA amplification

Course (Paper) Name and No.: III: Microbial Biochemistry II

CO1   Outline the procedures involving estimation of biomolecules

CO2   Prepare buffers of different strengths

CO3   Identify the lipid molecules after extraction

CO4   Determine the pK & pI value of amino acids

Course (Paper) Name and No.: IV: Medical Microbiology & Immunology

CO1   Identify/detect the presence of pathogens in specimens

CO2   Demonstrate the understanding of blood compatibility procedures

CO3   Use suitable rapid detection methods for identifying pathogens

CO4   Compose a write up on the topic of clinical trials.

Class: M. Sc. II Microbiology

Semester III

Course (Paper) Name and No.:I: Research Methodology

CO1   Demonstrate understanding of research methodology.

CO2   Design hypothesis and methods of data collection.

CO3   Differentiate between different types of sampling and variables.

CO4   Demonstrate understanding of data analysis and report writing.

Course (Paper) Name and No.:II: Food Microbiology

CO1   Explain the importance and sources of microorganisms in food

CO2   Analyze qualitative and quantitative microbial testing of food sample

CO3   Summarize the food quality parameters by using HAACCP, QA and QC

CO4   Explain general production methods of fermented food like Cheese, Sausage, Pickles etc.

Course (Paper) Name and No.:III: Advances in Biotechnology

CO1   Describe plant tissue culture techniques, for developing transgenic plants. By using vectors & selectable markers.

CO2   Explain the concepts of animal tissue culture to construct transgenic   animals which has better yielding capacity.

CO3   Differentiate between different methods for synthesis of nanoparticles and application of nanoparticles in the field of diagnostic and medicine.

CO4   Define concepts of pharmacogenomics, pharmacokinetics, and tissue engineering, prenatal , pre-implantation diagnosis, gene therapy and antisense technology in treatment of genetic diseases

Course (Paper) Name and No.: IV: Applied &Environment Microbiology

CO1   Illustrate the events of soil, marine and agricultural microbiology

CO2   Apply physiological and molecular techniques in microbial ecology studies

CO3   Analyze the water and food samples as a part of quality check

CO4   Construct knowledge on biotechnological application of extreme proteins

Semester IV

Course (Paper) Name and No.: Tools and Techniques: Bio-molecular Analysis

CO1   Construct the flow diagrams of spectroscopic techniques.

CO2   Compare between Gas chromatography and High-performance liquid chromatography

CO3   Explain molecular biology techniques such as PCR variations, Hybridization array technology, and FISH

CO4   Demonstrate the use of Microscopy, diffraction techniques and photoluminescence spectroscopy in nanotechnology studies.

Course (Paper) Name and No.: Pharmaceutical Microbiology

CO1   Explain the importance of QA, QC, and GMP aspects in the pharmaceutical industry.

CO2   Describe the importance of quality control and documentation in the pharmaceutical industry.

CO3   Analyse various validation and calibration methods used in the cosmetic industry.

CO4   Apply modern methods to test newly discovered drugs

Course (Paper) Name and No.: Advances in Biotechnology

CO1   Compare different downstream processing techniques for production of therapeutic compounds, and new methods for vaccine production and drug discovery.

CO2   Describe concepts of IPR and Bioethics in field of biotechnology,

CO3   Develop different methods for extraction of bioactive compounds from marine environment & its application in various fields.

CO4   Explain synthesis of DNA by different chemical and molecular methods, expression of protein in prokaryotic and eukaryotic expression host.

Course (Paper) Name and No.: Applied &Environment Monitoring & Management

CO1   Apply knowledge on management of natural resources and safety standards

CO2   Evaluate the issues related pollution and its management

CO3   Construct strategies to eradicate biofilm from different environments

CO4   Design strategies of bioremediation for field application

Class: M.Sc. I Biotechnology

Semester I

Course (Paper) Name and No.: Paper-I Advanced Biological Chemistry (PBT1ABC)

CO1   Discuss protein structure, folding pathways and diseases within the context.

CO2   Explain the enzyme catalysis, kinetics and relevance of enzymes.

CO3   Apply methodologies of Biomolecular interactions and DNA topology.

CO4   Elaborate on significance of Membrane architecture and lipid aggregates.

Course (Paper) Name and No.: Paper-II Immunology (PBT1IMM)

CO1   Discuss structural features of components of immune system as well as their function.

CO2   Explain the concept of cytokines, hypersensitivity reactions and Autoimmunity.

CO3   Elaborate tumour immunology, immunodeficiency and Transplantation.

CO4   Evaluate useful animal models in Immunology.

CO5   Apply their knowledge and design immunological experiments to demonstrate and figure out kind of immune responses.

Course (Paper) Name and No.: Paper-III Molecular Biology (PBT1MOB)

CO1   Compare the mechanism of replication in prokaryotes and eukaryotes

CO2   Elaborate on transcription in Prokaryotes & Eukaryotes

CO3   Explain the different DNA damage and repair systems

CO4   Discuss the mechanism of translation, gene expression and transposition

Course (Paper) Name and No.: Paper-IV Emerging Techniques in Biological Sciences (PBT1ETB)

CO1   Illustrate the principle underlying various advance microscopy & spectroscopy and proteomics techniques

CO2   Elaborate on emerging techniques in Genomics & Transcriptomics

CO3   Discuss the advanced techniques used in molecular cytogenetics

CO4   Explain the principle & application of the CRISPR-CAS system

Semester II

Course (Paper) Name and No.: Paper-I Metabolism (PBT2MET)

CO1   Illustrate major metabolic pathways with Principles of Metabolic regulations.

CO2   Justify role of metabolic pathways in various disease pathology.

CO3   Correlate different adaptations in plants with respect to carbon assimilation.

CO4   Discuss role of phytochemicals.

Course (Paper) Name and No.: Paper-II Cellular Processes and Developmental Biology (PBT2CPD)

CO1   Outline the concept of cell cycle regulation, cellular signalling, transport and trafficking.

CO2   Determine the role of Cell ECM and cell -cell interactions in maintenance of cellular integrity and functions;

CO3   Analyse genes and genetic changes affecting cycle regulation and mechanisms that lead to apoptosis.

CO4   Elaborate Human Embryonic development and Post fertilization events

Course (Paper) Name and No.: Paper-III-Bioprocess Technology (PBT2BPT)

CO1   Appreciate relevance of microorganisms from industrial context

CO2   Give an account of design and operations of various fermenters

CO3   Calculate yield and production rates in a biological production process, interpret data and need for oxygen and oxygen transfer;

CO4   Elaborate microbial/enzymatic industrial processes in the food and fuel industry.

Course (Paper) Name and No.: Paper-IV-Research Methodology and Scientific Communication Skills

CO1   Design research problems, formulating the objectives, test hypotheses and prepare scientific reports using appropriate research processes.

CO2   Appraise Research writing, Research ethics, Data fudging and Plagiarism with the help of statistical and referencing software.

CO3   Develop the concept of effective communication, presentation skills and computing skills for scientific research.

CO4   Critically analyse the classical papers in biotechnology through the existing methods of enquiry.

Class: M.Sc. II Biotechnology

Semester III

Course (Paper) Name and No.: Applied Virology and Microbiology- Paper- I

CO1   Students will learn theoretical knowledge of various diseases condition, causative agents, history, diagnosis & clinical manifestation.

CO2   Students will develop understanding about epidemiological principles in prevention, control and management of pandemic disease and emerging pathogens.

CO3   Students will become aware of organizations in disease control & research and also current research and developments in various diseases with understanding of antimicrobial resistance for management of drug resistance in population

CO4   Students will get to know about the characteristics of biofilms formed due to different infectious agents and get insights into latest development of diagnostics & therapeutics for such diseases.

Course (Paper) Name and No.: Environmental Biotechnology- Paper-II

CO1   Students will learn the use of microorganisms and their products in the prevention of environmental pollution through biotreatment of solid, liquid, and gaseous wastes

CO2   Students will get introduced to latest concepts in environmental biotechnology, various types of pollutions, monitoring, latest mitigation strategies and management of the same using microbiological, molecular and analytical methods

CO3   Students will develop understanding about Health hazards of pollution and waste, solid waste management.

CO4   Students will be able to understand biodiversity concepts and data management, biosensors and its application in environmental monitoring.

Course Name and No.: Biologics and Regulatory Affairs- Paper- III

CO1   Student will gain essential knowledge about Clinical and Biopharmaceutical Development along with the basic concepts and significance of Biologics/Biosimilar in addition to having knowledge about its therapeutic applications

CO2   Students will be aware of the techniques required for characterization of the Biosimilars relative to the Reference Biologics.

CO3   Students will know about the regulatory aspects of approval of a Biosimilars.

CO4   Students will have the knowledge of applications of systems biology in development of personalized medicine, drug development

Course Name and No.: Molecular Enzymology and Enzyme Technology- Paper- IV

CO1   Students will gain basic knowledge of mechanism of action, enzyme kinetics – factors affecting enzyme activity, regulation of enzyme activity & enzyme pattern in diseases.

CO2   Students will develop understanding regarding techniques and the underlying principle in enzyme purification and enzyme engineering.

CO3   Students will be able to integrate the practical aspects of Industrial application of enzymes.

CO4   Students will understand the role of Enzymes in diagnosis of diseases, therapeutic uses and as biosensors.

Class: M.Sc. II Biotechnology

Semester IV

Course (Paper) Name and No.: Nanobiotechnology- Paper- I

CO1   Students will gain the knowledge about Synthesis of nanometer scale materials.

CO2   Students will be able to understand the basic science behind the properties of nano-materials and the principles behind advanced experimental techniques for studying nano-materials.

CO3   Student will acquire knowledge on biomedical applications as well as toxicology studies of nanotechnology.

CO4   Students will get an insight into complete systems where nanotechnology can be used to improve our everyday life.

Course (Paper) Name and No.: Omics and Systems Biology- Paper- II

CO1   Students will understand how the data is generated by OMICS technologies to contribute to different databases along with screening, testing and treatment of human diseases

CO2   Students will Understand, compare and contrast the techniques involved in Genomics, Proteomics, Transcriptomics, Lipidomics and Metabolomics.

CO3   Students will gain the knowledge of advanced genomic and proteomic technologies and their data from high-quality human bio-specimens to identify potentially actionable therapeutic molecular targets.

CO4   Students will have the knowledge of applications of systems biology in development of personalized medicine, drug development

Course (Paper) Name and No.: Drug Discovery and Clinical Study- Paper- III

CO1   Students will have a firm foundation in Drug Discovery and Clinical Studies.

CO2   Students will able to learn about drug discovery-design pathway using some in-silico tools.

CO3   Students will be able to understand the clinical trial design set up

CO4   Students will gain information on rules-regulation and responsibilities in clinical studies.

Course (Paper) Name and No.: Scientific Writing and Food Biotechnology- Paper- IV

CO1   The course impart knowledge about the Guidelines for Medical writing & Plagiarism.

CO2   Students will understand about Presentation skills & Research ethics

CO3   Students will able to think critically, organize and analyze scientific data.

CO4   Students will be able to present their research results in the format of oral or poster presentations at conferences, to write scientific publications (theses, articles) and to prepare applications for scientific grants (research proposals).

Class: M.Sc. Computer Science

Semester I

Course (Paper) Name and No.: Analysis of Algorithm and Research Computing, Course Code: PCS1ARC

CO1   Describe detailed design strategies of the algorithm

CO2   Illustrate various advanced design and analysis techniques

CO3   Analyze Number- Theoretic algorithms to solve NP-completeness problems

CO4   Elaborate the ideas of research

Course (Paper) Name and No.: Design and Implementation of Modern Compiler, Course Code: PCS1DMC

CO1   Construct various effective parsers

CO2   Develop analyzer and interpreter for specified constraints

CO3   Evaluate advance syntax and basic semantic analysis

CO4   Analyze the data flow to perform loop optimization

Course (Paper) Name and No.: Advanced Database Management System, Course Code: PCS1ADS

CO1   Describe the concept of distributed database systems.

CO2   Analyse database management in a centralized and distributed environment.

CO3   Illustrate data modelling and database development processes for object-oriented, Temporal, and Spatial databases.

CO4   Explain the use of deductive, active, and multimedia databases

Course (Paper) Name and No.: Robotics and Artificial Intelligence, Course Code: PCS1RAI

CO1   Describe the concepts of robotics and its components.

CO2   Analyze the internal and external perceptions of the robot based on different types of sensors.

CO3   Evaluate the planning, mapping, and navigation of robots.

CO4   Identify appropriate AI methods to solve a given problem

Course (Paper) Name and No.: Practical's of PCS1ARC+PCS1DMC, Course Code: PCS1PPR1

CO1   Develop programs for the implementation of different algorithms.

CO2   Evaluate time and space complexity for an algorithms

CO3   Construct various effective parsers

CO4   Develop analyzer and interpreter for specified constraints

Course (Paper) Name and No.: Practical's of PCS1ADS+PCS1RAI, Course Code: PCS1PPR2

CO1   Create a database using XML attributes and elements

CO2   Create spatial and temporal database and apply queries on it

CO3   Design a robot using different physical components

CO4   Test AI searching algorithms for real world problems

Semester II

Course (Paper) Name and No.: Cloud Computing, Course Code: PCS2CLD

CO1   Articulate the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing

CO2   Identify problems, and explain, analyze, and evaluate various cloud computing platforms for the solution

CO3   Implement different types of Service Oriented Architecture systems

CO4   Analyze the issues in Resource provisioning and Security governance in clouds

Course (Paper) Name and No.: Natural Language Processing, Course Code: PCS2NLP

CO1   Understand the mathematical and linguistic foundations underlying approaches to the various areas in NLP

CO2   Apply NLP techniques to design real-world NLP applications such as machine translation, text categorization, text summarization, information extraction, etc.

CO3   Model linguistic phenomena with formal grammar

CO4   Understand of the field of natural language processing

Course (Paper) Name and No.: Business Intelligence and Big Data Analytics-I, Course Code: PCS2BI1

CO1   Describe the concepts of Business Intelligence

CO2   Explain business Data Warehouse

CO3   Build business Data Warehouse

CO4   Evaluate data mining process and Association analysis

Course (Paper) Name and No.: Machine Intelligence Course Code: PCS2ML1

CO1   Identify basic concepts and types of learning from data.

CO2   Describe dimensionality reduction technique for attribute reduction.

CO3   Create ensemble models using different Machine Learning techniques.

CO4   Build probabilistic and unsupervised learning models for handling unknown pattern

Course (Paper) Name and No.: Practical's of Cloud and NLP, Course Code: PCS2PPR1

CO1   Design & develop backup strategies for cloud data based on features

CO2   Construct Secure layer for data and Internet

Course (Paper) Name and No.: Practical's of BI and MI, Course Code: PCS2PPR2

CO1   Construct a regression and classification model using different algorithms

CO2   Develop an application to create dimension tables in a cube and generate star schema
, and snowflake schema

CO3   Construct Ensemble Model using Bootstrap technique

CO4   Develop security mechanisms for computer and database

Class: M.Sc. II Computer Science

Semester III

Course (Paper) Name and No.: P-I, Ubiquitous Computing PCS3UBC

CO1   Describe the characteristics of pervasive computing applications

CO2   Analyze the strengths, problems and limitations of the current tools, devices and communications for pervasive computing systems.

CO3   Identify the different ways that humans will interact with systems in a ubiquitous environment

CO4   List and exemplify the key technologies involved in the development Ubicomp systems

Course (Paper) Name and No.: P-II, Social Network Analysis PCS3SNA

CO1   Describe the concept of Social Network Analysis

CO2   Analyze centrality and centralization in Social Network Analysis

CO3   Apply similarity measures and equivalence concepts in Social Network Analysis

CO4   Design two mode social networks

Course (Paper) Name and No.: Elective I- Track A: Cloud Computing -II PCS3CL2

CO1   Describe different characteristics of public, private and hybrid cloud deployment models

CO2   Choose various cloud technologies for building applications.

CO3   Analyze different types of Virtualization and service Oriented Architecture systems.

CO4   Analyze the cloud security issues

Course (Paper) Name and No.: Elective I- Track B: Cyber and Information Security II PCS3CI2

CO1   Explain the fundamentals concepts of computer forensics

CO2   Analyze computer forensic methods for data recovery, evidence collection, and data seizure

CO3   Develop different Security System for data and network

CO4   Illustrate procedure of network and mobile forensics

CO5   Explain the fundamentals concepts of computer forensics

Course (Paper) Name and No.: Elective II- Track C: Business Intelligence and Big Data Analytics –II (Mining Massive Data sets) PCS3BI2

CO1   Apply preprocessing techniques on Big data

CO2   Apply relational algebra, matrix operations using map reduce

CO3   Analyze similarity and hashing concepts of documents

CO4   Evaluate stream concepts like sampling, filtering, estimating moments etc.

Course (Paper) Name and No.: Elective II - Track D, Machine Learning –II PCS3AML

CO1 Acquire point estimation techniques for estimating parameters of machine learning models

CO2 Analyze advanced Machine Learning techniques for classification

CO3 Compare different sampling techniques

CO4 Construct directed acyclic graph

Course: Practical's of PCS3UBI and PCS3SNA Course Code: PCS3PPR1

CO1 Develop an attitude to identify and propose solutions for security and privacy issues.

CO2 Design Android security application

CO3 Demonstrate various types of measures for Social Networks

CO4 Design sociogram for person-by-person network

Course: Practical's of PCS3CL2/ PCS3CI2 + PCS3BI2/ PCS3ML2 Course Code: PCS3PPR2

CO1 Build an application on a private cloud.

CO2 Develop FOSS-Cloud functionality using cloud services

CO3 Analyze evidences and disk image of data from forensic tools

CO4 Solve Investigation Case using Forensic tool.

CO5 Apply various probability functions for standard statistical distributions

CO6 Develop a program for implementation of map reduction techniques and shingles for a given data set

Semester IV

Course (Paper) Name and No.: P-I, Simulation and Modelling PC4SIM

CO1   Describe basic concepts of simulation models

CO2   Apply verification and validation on simulation models

CO3   Analyze various types of simulation models

CO4   Design state-based behaviour of simulation

Course: Cloud Computing-III(Building Clouds and Services) Course Code: PCS4CL3

CO1   Describe specialised Cloud mechanism

CO2   Analyse Cloud Computing Software architecture

CO3   Acquire the knowledge about Virtualization concepts

CO4   Design real time monitoring mechanism for building private cloud

Course: Cyber and Information Security-II(Cryptography and Cryptanalysis) Course Code: PCS4CI3

CO1   Analyze Particular information and network security Problems

CO2   Identify generic security threats and Vulnerabilities

CO3   Assess and Apply various cryptographic techniques

CO4   Implement security solutions for confidentiality, Authentication and privacy

Course: Business Intelligence and Big Data Analytics-III(Intelligent Data Analysis)

Course Code: PCS4BI3

CO1   Explain various strategies of Clustering

CO2   Identify various algorithms for particular class of problems

CO3   Apply dimensionality reduction techniques

CO4   Explain the concepts of link analysis and recommendation systems

Course: Machine Learning-III (Computational Intelligence) Course Code: PCS4ML3

CO1   Describe the basic concepts of ANN

CO2   Compare different types of evolutionary computation strategies

CO3   Discuss various approaches of Swarm Intelligence

CO4   Develop a rule based system using Fuzzy logic.

Course: Practical's of Simulation & Modelling and Specialization Course Code: PCS4PPR1

CO1   Design and develop agent based and system dynamics models.

CO2   Develop Cloud computing services using cloud tools

CO3   Apply clustering , hierarchical and density based algorithms to the given data set

CO4   Design recommendation system

CO5   Apply Evolutionary, Neural Network and optimization algorithms to the given data set

CO6   Develop Cryptographic Techniques to secure data

CO7   Apply Public Cryptosystem to encrypt and decrypt data

Course: Internship with Industry Course Code: PCS4PPR2

CO1   Assess interests and abilities in their field of study.

CO2   Develop work habits and attitudes necessary for job success.

CO3   Develop communication, interpersonal and other critical skills in the job interview process.

Course: Project Implementation Course Code: PCS4PPR3

CO1   Analyse data and synthesize research findings

CO2   Demonstrate an understanding of the ethical issues associated with practitioner research

CO3   Improve engagement in recent research areas of industry

Class: M.Sc. Information Technology

Semester I

Course (Paper) Name and No.: Cloud Computing, Course Code: PIT1CLC

CO1   Classify various service delivery models of a cloud computing architecture.

CO2   Define the types of cloud.

CO3   Explain cloud security mechanism.

CO4   Elaborate scalability architecture and service load balancing architecture.

Course (Paper) Name and No.:   Cloud Computing Practical, Course Code: PIT1CCP

CO1   Create web services using java application (Netbeans).

CO2   Develop Xen Virtualization and manage with Xen Center.

CO3   Create windows hyper v virtualization.

CO4   Make use of virtualization using VMWare ESXi server and managing with vCenter.

Course (Paper) Name and No.: Research in Computing, Course Code: PIT1RIC

CO1   Define the role of business research.

CO2   Classify stages of the research process.

CO3   Distinguish different research methods and measurement concepts.

CO4   Explain different concepts of data analysis.

Course (Paper) Name and No.: Research in Computing Practical, Course Code: PIT1RCP

CO1   Build a program for obtaining descriptive statistics of data using Python and MS-Excel

CO2   Analyze primary data and secondary data of given case study

CO3   Test hypothesis using statistical tools

CO4   Examine given data using different sampling technique.

Course (Paper) Name and No.: Data Science, Course Code: PIT1DSC

CO1   Explain layered framework and technology stack in data science.

CO2   Elaborate management layers in data science.

CO3   Explain assess supersteps in data science.

CO4   Utilize transform and report supersteps.

Course (Paper) Name and No.: Data Science Practical, Course Code: PIT1DSP

CO1   Modify different format to HOURS format.

CO2   Construct program using utilities and auditing in data science.

CO3   Build a program to retrieve, assess, process, transform and organise the data in data science.

CO4   Create data visualization with power BI and Cassandra

Course (Paper) Name and No.: Soft Computing Techniques, Course Code: PIT1SCP

CO1   Explain soft computing techniques and their roles in building intelligent machines.

CO2   Determine the use of Artificial Intelligence, Fuzzy logic & Genetic algorithms.

CO3   Make use of neural networks for classification and regression problems.

CO4   Evaluate soft computing approaches and solutions for a given problem.

CO1   Design a simple linear neural network model.

CO2   Make use of a program for Back Propagation Algorithms.

CO3   Solve the Tipping problem using fuzzy logic.

CO4   Create two classes, City and Fitness using Genetic algorithm.

Semester II

Course (Paper) Name and No.: Image Processing, Course Code: PIT2IGP

CO1   Explain basic fundamental concepts of digital image processing.

CO2   Examine the images in the frequency domain using various transforms.

CO3   Evaluate the techniques for image enhancement, restoration & Categorize of various compression techniques.

CO4   Interpret Image compression, image segmentation, and representation techniques.

Course (Paper) Name and No.: Image Processing Practical, Course Code: PIT2IPP

CO1   Design a program for image transformation

CO2   Develop a program for Filtering in Frequency Domain

CO3   Design a program for Color Image Processing

CO4   Apply image compression & segmentation.

Course (Paper) Name and No.: Modern Networking, Course Code: PIT2MNW

CO1   List the elements of Modern Networking

CO2   Classify different levels of Software Define Network

CO3   Explain Network Virtualization Function and VLAN

CO4   Summarizing Quality of Service, Quality of Experience & Modern Network Architecture.

Course (Paper) Name and No.: Modern Networking Practical, Course Code: PIT2MNP

CO1   Build IP SLA Tracking & Path Control

CO2   Create AS-PATH attribute

CO3   Construct IBGP & EBGP Session & Secure Management Plan

CO4   Develop Inter VLAN Routing , MPLS Environment , VRF and SDN Controller

Course (Paper) Name and No.: Micro services Architecture, Course Code: PIT2MSA

CO1   Define Micro services Architecture & Micro services Boundaries

CO2   Elaborate Service Design and Micro Services in Practice

CO3   Explain ASP.Net Core, Docker and Continuous Integration

CO4   Explain Data Services & Micro Services Ecosystems

Course (Paper) Name and No.: Micro services Architecture Practical Course Code: PIT2MAP

CO1   Build ASP.Net Core MVC Application & Rest API

CO2   Make use of Docker & Docker Commands

CO3   Create Micro Services & Backing Services with ASP.Net Core

CO4   Make use of CircleCI for Continuous Integration & Kubernet

Course (Paper) Name and No.: Big Data Analytics, Course Code:PIT2BDA

CO1   Explain characteristics of Data and Big Data

CO2   Explain clustering and association algorithm

CO3   Solve problem based on classification methods

CO4   Elaborate Data Products and Patterns with Hadoop in Data science

Course (Paper) Name and No.: Big Data Analytics Practical, Course Code: PIT2BDP

CO1   Build Hadoop and HDFS

CO2   Construct a program using MapReduce

CO3   Develop application in MongoDB

CO4   Design an application in Hive

Class: M.Sc. II Information Technology

Semester III

Course (Paper) Name and No.: P-I, Embedded system

CO1   Learners will be able design, describe, validate and optimize embedded electronic systems in different industrial application areas.

CO2   Learners will be able define hardware and software communication and control requirements.

CO3   Learners will be able to acquire knowledge of and be able to use tools for the development and debugging of programs implemented on microcontrollers and DSPs.

CO4   Learners will be able to design electronic circuits for the processing of information in communications and control systems.

CO5   Learners will be able to acquire knowledge of sensor properties and apply these in the design of Electronic systems which integrate measurement and actuation in different industrial production contexts.

Course (Paper) Name and No.: P-II, Information Security Management

CO1   Learners will be able to discover potential problems before they occur so that risk-handling activities may be planned and invoked as needed across life of product or project to mitigate adverse impacts on achieving objectives with Risk management

CO2   Learners will be able to construct a basic level of security, independent of external requirements so they can maintain the uninterrupted operation of the IT organization.

CO3   Learners will be able to describe key management which is the process of administering or managing cryptographic keys for a cryptosystem.

CO4   Learners will be to analyze the risks or threats to the success of the plan and test the controls in place to determine whether or not those risks are acceptable.

CO5   Learners will be able to summarize the basic process of identifying, preserving, analyzing and presenting the digital evidence in such a manner that the evidences are

legally acceptable

Course (Paper) Name and No.: P-III, Virtualization

CO1   Learners will be able to identify basics of virtualization and types of virtualization.

CO2   Learners will be able to describe different server virtualization platforms and its uses

CO3   Learners will be able to construct an Enterprise network using network virtualization

CO4   Learners will be able to explain various storage types in virtualization

CO5   Learners will be able to explain Blade servers and its working

Course (Paper) Name and No.: P-IV, Ethical Hacking

CO1   Learners will able to describe the basics of ethical hacking and its phases.

CO2   Learners will able to explain how to hack systems & protect systems from Trojans, Backdoors, Virus & worms

CO3   Learners will able to compare methods of hacking.

CO4   Learners will able to discover how to hack web applications, wireless networks, mobile platforms ethically and techniques like SQL injection

CO5   Learners will able to identify ethical hacking techniques and tools.

Semester IV

Course (Paper) Name and No.: P-I, Artificial Intelligence

CO1   Learners will able to determine knowledge of the building blocks of AI as presented in terms of intelligent agents.

CO2   Learners will able to apply basic principles of AI in solutions that require problem solving

CO3   Learners will able to formulate and solve problems with uncertain information using Bayesian approaches.

CO4   Learners will able to define basic concepts in Artificial Intelligence

CO5   Learners will able to develop simple programs in Prolog Programming

Course (Paper) Name and No.: P-II, IT Infrastructure Management

CO1 Learners will able to describe development of service concepts in preparation for the selection of services to be provided.

CO2 Learners will able to discuss profitable services that provide a high level of quality to satisfy the business needs.

CO3 Learners will able to discover any potential risk and provide measures to overcome its impact on other services and business.

CO4 Learners will able to explain IT service operations used to ensure that the required IT services are delivered efficiently and effectively as per the service level agreements to the business users and customers.

CO5 Learners will able to consider continuously improving the service quality after the service has been put into operation.

Course (Paper) Name and No.: P-III, Computer Forensics

CO1 Learn Basics about Computer Forensics

CO2 Learn about processing crimes and how to use latest technology

CO3 Lear about Macintosh OS and other forensic analysis techniques.

CO4 Learn about Virtual Machines and network forensics

CO5 Learn how to write report and give expert testimony

Course (Paper) Name and No.: P-IV, Cloud Management

CO1 Learners would be able to explain virtualized data center and cloud infrastructures.

CO2 Learners would be able to explain storage network designs.

CO3 Learners would be able to describe system center 2012 Infrastructure.

CO4 Learners would be able to develop and maintain System center 2012 with configuration manager 2012.

CO5 Learners should be able to apply monitoring in System center 2012.

Janardan Bhagat Shikshan Prasarak Sanstha's

Changu Kana Thakur
Arts, Commerce and Science College, New Panvel (Autonomous)

Plot No.-1 and 4, Sector-11, Khanda Colony, New Panvel (W),
☎ : District- Raigad, Maharashtra, India, Pin-410 206
(022) 2745 5760, 2746 4193, Fax: (022) 2746 1569
Super Fax: +91 9022933585, P.O. Box No.-133
Email: principal@ckthakurcollege.net, URL: www.ckthakurcollege.net