



॥ 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 2020-2021**

**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

## Course Outcomes

**Class: F.Y.B.A. (English)**

**Semester I and II**

### **Course (Paper) Name and No.: Introduction to Literature I**

- CO1 To write clearly, coherently and effectively about various genres of literature.
- CO2 To recognize the culture and context of the work of literature.
- CO3 To develop sensitivity to nature and fellow human beings.
- CO4 To make the students at ease while learning English literature.
- CO5 To understand the relationship between literature and society.

### **Course (Paper) Name and No.: Communication Skills of English I**

- CO1 To understand the importance of communication skills of English.
- CO2 To build up language competency in English.
- CO3 To make students to comprehend the functionality of English Language.
- CO4 To make students better at reading and writing in English.
- CO5 To construct the positive approach about English language.

## **Course Outcomes**

**Class: F.Y. B. Com.**

**Semester I and II**

**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 Outcomes**

**Class: F.Y. B.Com. (Accounting and Finance)**

**Semester I and II**

**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 Outcomes**

**Class: F.Y. B.M.S.**

**Semester I and II**

### **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

## **Class: S.Y.B.A. (English)**

### **Semester III and IV**

#### **Course (Paper) Name and No.: Indian Literature in English II**

- CO1 To appreciate literary beauty depicted in the essays.
- CO2 To understand thematic concerns reflected in prominent Indian writers.
- CO3 To learn the pluralistic dimensions of Indian Literature in English
- CO4 To understand importance of Indian culture represented in English

#### **Course (Paper) Name and No.: American Literature III**

- CO1 To appreciate literary terms of Twentieth Century American Literature.
- CO2 To understand thematic concerns reflected in prominent American writers
- CO3 To develop gender equality in the personality of students
- CO4 To inculcate moral and social values in order to become better citizens
- CO5 To maintain equality and justice irrespective of race and class in the society.

## **Class: T.Y.B.A. (English)**

### **Semester V and VI**

#### **Course (Paper) Name and No.: 16<sup>th</sup> to 18<sup>th</sup> Century English Literature IV**

- CO1 To understand the distinctive features of English literature of the 16th, 17th and 18th centuries
- CO2 To comprehend how background influences shaped the writer's thinking.
- CO3 To recognize and appreciate the literary masters who dominated the scene.
- CO4 To grasp the different writing styles that each age adopted.
- CO5 To understand the relationship between literature and society

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

- CO1 To use important critical terms in the analysis of literary works.
- CO2 To create an awareness about the nature and function of literature and criticism
- CO3 To impart the technique of close reading of literary texts
- CO4 To understand the various literary theories and critical approaches
- CO5 To make the students familiar with the tenets of practical criticism

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

- CO1 To gain a basic understanding of phonetics, morphology and word transformation
- CO2 To have improved speaking skills
- CO3 To enhance adequate knowledge of the rules of grammar, grammatical analysis and sentence transformation
- CO4 To write effectively in various domains of English Language.

### **Course (Paper) Name and No.: 19<sup>th</sup> Century English Literature (VII)**

- CO1 To view literary works in their dynamic interface with the background
- CO2 To understand the literature of the 19<sup>th</sup> century as a complex outcome of artistic, intellectual and socio-political cross-currents
- CO3 To appreciate poetry as mirroring private personality, protest and subsequently public concerns
- CO4 To view the development of the Victorian Novel as informed by Victorian morality as well as by larger democratic processes
- CO5 To contextualize the impulses behind the significant emergence of women writing in the 19<sup>th</sup> century

### **Course (Paper) Name and No.: 20<sup>th</sup> Century British Literature (VIII)**

- CO1 Students will be equipped with comprehensive understanding of literary genres, trends and movements in 20<sup>th</sup> Century British Literature; thereby, enabling them to understand the valuable co –relation between the socio-cultural, economical and historical contexts; behind the literary production.
- CO2 Students will acquire the discipline to become reflective and imaginative thinkers through a close, critical and analytical reading of the prescribed texts

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

- CO1 Read and interpret cross cultural texts.
- CO2 Understand protest literature.
- CO3 Get sensitized towards global issues.
- CO4 Learn to look into past, correlate it to present and future.
- CO5 Understand the historicity of protest literature

# **Department of Economics**

## **Bachelor of Arts**

### **Programme Specific Outcomes**

- PSO1 Students will be 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 be able to appear in different fields of economics.
- PSO4 Students can participate in various examinations linked to economics.

## Course Outcomes

### Class: F.Y.B.A. (Economics)

#### Semester I

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

- CO1 Learners will understand the concepts of micro economics.
- CO2 Learners will able to understand the ten principles of economics.
- CO3 Learners will understand the structure of market, as well as demand and supply.
- CO4 Learners will understand the nature of consumer's.

#### Semester II

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

- CO1 Learners will understand the process of production analysis.
- CO2 Learners will get with the concepts of cost and Revenue analysis.
- CO3 Learners will understand the details about factor pricing and their rewards.
- CO4 Learners will understand equilibrium of different market structures.

## **Class: S.Y.B.A. (Economics)**

### **Semester III**

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

- CO1 Learners will learn about various types of income.
- CO2 Learners will study the theories related to consumption.
- CO3 Learners will learn the supply of money and demand for money.
- CO4 Learners will understand the banking structure.

#### **Course (Paper) Name and No.: Public Finance - III**

- CO1 Learners will understand the basic concepts of public finance.
- CO2 Learners will get information about budget and tax structure.
- CO3 Learners will know public expenditure and debt.
- CO4 Learners will know the sources of income and ways to expenditure.

#### **Course (Paper) Name and No.: Demography - Applied Economics**

- CO1 Learners will know the basic concepts of demography.
- CO2 Learners will learn sources of data.
- CO3 Learners will get ideas of Techniques of analysis.
- CO4 Learners will get Idea about the nature of study of demography.

### **Semester IV**

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

- CO1 Learners will understand the detail concept of Inflation.
- CO2 Learners will understand fiscal and monetary policies.
- CO3 Learners will understand post Keynesian Economics.
- CO4 Learners will understand external sector and different exchange rates.

### **Course (Paper) Name and No.: Indian Economy -III**

- CO1 Learners will know the introductory part of the Indian Economy.
- CO2 Learners will understand the nature of agriculture sector of the Indian Economy.
- CO3 Learners will get the details about industrial sector of India.
- CO4 Learners will be able to know service sector of Indian Economy.

### **Course (Paper) Name and No.: Demography**

- CO1 Learners will get information about changing trends of fertility, Nuptiality, life Table and Mortality.
- CO2 Learners will aware about migration and urbanization.
- CO3 Learners will get idea how policy frames and work.
- CO4 Learners will get detail information about family planning.

## **Class: T.Y.B.A. (Economics)**

### **Semester V**

#### **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 Economic Thought - IX**

- CO1 Learners are studied the classical thought of economist.
- CO2 Learners are understand the Marshall and Schumpeter's historical thought
- CO3 Learners are studied the Keynesian views.
- CO4 Learners are able to discriminate the Keynesian and post Keynesian views.

## **Semester VI**

### **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

# 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 रुचि 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।

## Course Outcomes

**Class: F.Y.B.A. (Hindi)**

**Semester I and II**

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

- CO1 To be able to understand and explain the distinct social consciousness as expressed by eminent writers like Premchand, UshaPriyamwada, Manu Bhandari, Om Prakash Walmiki etc. through their short stories
- CO2 Clear understanding of the spirit of Nationalism, Human Values and social commitment by way of various poems and stories
- CO3 Enhanced sensitiveness and humility among students
- CO4 Students are in position to compare and contrast paragraph using vocabulary

### **Course (Paper) Name and No.: Hindi Optional-I**

- CO1 Get familiarized to basic writing in Hindi.
- CO2 Generate interest in Hindi literature.
- CO3 Get familiarized various types of literature
- CO4 Understanding the origin of Hindi language and its literature.

## **Class: S.Y.B.A. (Hindi)**

### **Semester III and IV**

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

- CO1 To be able to clearly describe the prevailing philosophy of life and writing skills of the authors with reference to the socio cultural scenario of their period.
- CO2 To be able to understand various social messages and ethical lessons covered during Bhakti Kaal by Sant like Kabir, Namdev, Raidas, Meerabai, Bihari, Rahim, Tulsidas, Surdas. Majority of these learnings are valid in current context as well
- CO3 To be able to understand and articulate various prevalent social issues by way of poetry
- CO4 To be able to understand the insights shared by Maithili Sharan Gupt, who has always attempted to give due importance to the ladies who were either ignored or misunderstood. Yashodhara also covers the various emotions experienced by Yashodhara who was abandoned by her husband. Here, due credit is being given to the sacrifice and contribution of Yashodhara as she also deserves recognition along with the greatness attained by Gautam Buddhas

#### **Course (Paper) Name and No.: Modern Prose, Paper-III**

- CO1 To be able to understand and establish the linkage between nationalism and mythological aspects of "Baba Bhatteshwar" in his book "Baba Bhatteshwar Nath" by Baba Nagarjun.
- CO2 To be able to recognize and describe the context along with style of modern one act play expressed by various modern writers.
- CO3 To be able to understand various prevalent social issues by way of stories.
- CO4 To understand the historical aspects of a renowned town in Odisha namely 'Konark', written by Jagdish Chandra Mathur.

## **Class: T.Y.B.A. (Hindi)**

### **Semester V and VI**

#### **Course (Paper) Name and No.: Hindi Sahitya Ka Itihas, (Adhunik kal) Paper-IV**

- CO1 Understanding the origin of Hindi language and its literature.
- CO2 Identifying the dialects of Hindi language family.
- CO3 Understanding the concept of history of literature.
- CO4 Understanding the basis of the classification of Hindi literature.
- CO5 Understanding the importance and basis of the names given to each period of Hindi literature.
- CO6 Understanding the features of Adikal, Bhakti kal, Ritikal and Adhunikkal, in context of socio - cultural and political condition of that period.
- CO7 Understanding the reason of emergence of Adhunikkal in Hindi literature.
- CO8 Understanding the literary trends of Adhunik kal.

#### **Course (Paper) Name and No.: Post-Independence Hindi Literature, Paper-V**

- CO1 To be able to identify and understand the various forms of post-independence Hindi Literature
- CO2 To understand and appreciate the various unique writing styles of writers of post-independence time
- CO3 To be able to identify and distinguish various forms of poetry and prose
- CO4 To be able to understand the prevailing topics of that era which were influencing the thought process of writers and poets

**Course (Paper) Name and No.: Hindi me Suchna Prodyogiki , Social Media Paper-VI**

- CO1 To be able to identify and understand the various forms social media, their ultimate usage.
- CO2 To understand and appreciate the various unique electronic forms of services available.
- CO3 To be able to identify usage of Hindi in the world of Internet.
- CO4 To be able to understand the digitalization in various stages taking place in India.
- CO5 To understand the contribution of Information technology in India's education system.
- CO6 To be able to identify limitations, challenges of Information technology.
- CO7 To be able to understand positive and negative impacts of Information Technology and development of social media in India.
- CO8 To be able to understand law of Social media.

**Course (Paper) Name and No.: Literary Criticism: Prosody & Rhetorics, Paper-VII**

- CO1 To understand the various forms of principles in Literature.
- CO2 To understand types, forms, definitions and classification of art and its relation with Literature.
- CO3 To understand various forms of poetry.
- CO4 To be able to understand about verses and figure of speech.
- CO5 To understand the meaning, definition and various forms of word power and their types.
- CO6 To be able to identify meaning and forms of genres.
- CO7 To be able to understand various types of passage forms.

### **Course (Paper) Name and No.:Linguistics Hindi, Language & Hindi Grammar-VIII**

- CO1 To describe the various concepts and importance of Linguistics
- CO2 To recognize & appreciate different flows of Hindi Language(Raj bhasha,Bolibhasha etc)
- CO3 Students are able to comprehend the introductory concepts of Hindi grammar and linguistics
- CO4 Students are able to identify and distinguish various ancient and medieval period languages i.ePali, Prakrut, Apbhransh.
- CO5 Students are able to understand and use the different forms of Khadiboli (Hindi, Urdu etc.)

### **Course (Paper) Name and No.: Mass Media, Paper-IX**

- CO1 To understand the journey of Mass Media and application of modern options
- CO2 Clear understanding of all relevant theories supporting the operational aspects of reputed Institutes
- CO3 To be able to join the Media Houses with help of acquired knowledge
- CO4 To be able to distinguish various traditional and modern platforms and their relevance, evolution, features and applications along with impact.
- CO5 To be able to understand the use of Hindi in the field of Media

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

## Course Outcomes

### Class: F.Y.B.A. (Geography)

#### Semester I

##### Course (Paper) Name and No.: Paper No. I – Geomorphology

- CO1 Understand comprehensibly the nature and scope of Geomorphology
- CO2 Understanding the composition and structure of the interior of the earth and the types Rocks.
- CO3 Understand the Diastrophic and catastrophic movements of the earth's surface
- CO4 Understand the concept and types of weathering and erosion.
- CO5 Understand the erosional and depositional landforms by the erosional agents.
- CO6 Identification of contours, slopes and drawing of sections to depict contour landforms.

#### Semester II

##### Course (Paper) Name and No.: Paper No. I – Human Geography

- CO1 Understand comprehensibly the nature, scope, approaches, branches and concepts in Human Geography
- CO2 Understanding the concept, types and patterns of rural and urban settlements.
- CO3 Understand the determinants on growth, distribution and problems of population.
- CO4 Understand the concept, causes, types, trends and consequences of migration.
- CO5 Able to construct and interpret of line graphs and flow diagrams and other techniques.

## **Class: S.Y.B.A. (Geography)**

### **Semester III**

#### **Course (Paper) Name and No.: Paper No. II - An Introduction to Climatology**

- CO1 Understand the introduction to Climatology considering weather & climate, role of climate in human life, aims, nature, scope, and some other sub division of the course.
- CO2 Understand weather phenomena winds, humidity, precipitation and winds.
- CO3 Understand the process, methods of weather forecasting and climatic changes
- CO4 Able to read and interpret the weather map and to construct the various graphs related to climatology.

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

- CO1 Understand importance of the location and the geographical personality of India.
- CO2 Understand the variability of drainage pattern and climate in India.
- CO3 Study of problems related to soil and forest depletion and their conservation methods.
- CO4 Study of problems related to minerals and power resources and their conservation methods
- CO5 Show the geographical features in the map of India.
- CO6 Read, convert and prepare the map scale.

### **Semester IV**

#### **Course (Paper) Name and No.: Paper No. II - An Introduction to Oceanography**

- CO1 Understand importance and physical structure of ocean.
- CO2 Knowledge about effect of ocean Currents.
- CO3 Understand the relationship between man and ocean.
- CO4 Study about movements of ocean water
- CO5 Read and interpret the bathymetrical maps.

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

- CO1 Understand the introduction to agriculture, nature, scope, significance and approaches of agriculture geography.
- CO2 Understand features, determinants, major crops and problems of Indian agriculture
- CO3 Understand the history, components and impacts of green revolution in India.
- CO4 Understand the development of recent trends in agriculture in India.
- CO5 Interpret the thematic maps and draw the statistical diagrams and graphs

## **Class: T.Y.B.A. (Geography)**

### **Semester V**

#### **Course (Paper) Name and No.: Geography of Settlements**

- CO1 Understand the nature and scope of Settlement Geography and the characteristics of rural and urban settlements.
- CO2 Understand the structure of house and building materials, regional variations of rural settlement in India.
- CO3 Understand the history of world settlements and factors responsible for world settlements.
- CO4 Understand the classification and morphology, pattern and nature and process of rural and urban settlements
- CO5 Understand the process of urbanization, urban problems and smart cities in India.

#### **Course (Paper) Name and No.: Geography of Maharashtra**

- CO1 Understand the location, administrative setup and geographical personality of Maharashtra
- CO2 Understand the drainage and climate in Maharashtra
- CO3 Understand the natural and human resources of Maharashtra
- CO4 Understand the agriculture, fishing and livestock resources in Maharashtra.
- CO5 Understand the growth and development of industries, trade and transport in Maharashtra

### **Course (Paper) Name and No.: Population Geography**

- CO1 Understand the nature, scope, importance and relation with other social sciences of Population Geography
- CO2 Understand the structure, growth, density & distribution of population in India and World.
- CO3 Get knowledge about population theories.
- CO4 Understand the causes, consequences and recent trends of migration in India
- CO5 Understand the contemporary issues of population in India.

### **Course (Paper) Name and No.: Tools and Techniques In Geography For Spatial Analysis-I (Practical)**

- CO1 Understand the basic concept and types map projections.
- CO2 Understand the Basic elements of map and able to area calculation.
- CO3 Able to read and interpret of topographical maps.
- CO4 Able to use the computer with basic Microsoft and SPSS software's.
- CO5 Able to prepare the thematic maps by using different techniques

### **Course (Paper) Name and No.: Regional Planning and Development**

- CO1 Understand the concept, nature and problems of Regional Planning
- CO2 Gain knowledge about definition of region, evolution and types of regional planning.
- CO3 Understand the concept, strategies and measurements of regional disparities and different models of regional development.
- CO4 Understand the regional planning of India.

### **Course (Paper) Name and No.: Geography of Resources**

- CO1 Understand the concept, factors, importance and classification of resources.
- CO2 Know the over exploitation and conservation measures of natural resources.
- CO3 Learn the importance, consumption, problems and Conservation methods of water, forest, soil and mineral resources.
- CO4 Understand the concept and distribution of human resources.

### **Course (Paper) Name and No.: Geography of Health**

- CO1 Understand the nature, scope, approaches and evolution geography of Health Geography.
- CO2 Understand the Causes, effects and remedial measures of air, water, radioactive and plastic pollution.
- CO3 Learn the geographical background of diseases, types and case studies of communicable and non-communicable diseases
- CO4 Understand the linkages of health with environment and health related issues.
- CO5 Understand the Health care facilities, distribution, policies and health organisations in India.

### **Course (Paper) Name and No.: Geography Of Disaster Mitigation And Management**

- CO1 Understand the definition, classification and impacts of disasters and hazards.
- CO2 Understand the concept and role of national and international organisations for disaster management.
- CO3 Understand the causes, effects and distribution of natural disasters and its management in India
- CO4 Understand the anthropogenic disasters and its management in India.

### **Course (Paper) Name and No.: Geospatial Technology**

- CO1 Understand the Concept, Components Importance and history of Geospatial Technology
- CO2 Able to analyze and interpret the aerial photographs and satellite imageries.
- CO3 Able to understand the concept and Applications GPS and capable to survey through GPS.
- CO4 Understand the concept, Components and applications of GIS and capable to data analysis by using the GIS software

## **Semester VI**

### **Course (Paper) Name and No.: Environmental Geography**

- CO1 Understand the nature, scope, importance and man-environment relationship in Environmental Geography
- CO2 Understand the Structure, functions and types of ecosystem.
- CO3 Acquire knowledge about biodiversity and its importance and Management.
- CO4 Understand the concept, types, distribution and hotspots of biodiversity
- CO5 Understand environmental problems there Cause, Effect and Remedies.
- CO6 Understand the Sustainable Development and Environmental Management methods in India.

### **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.: Political Geography**

- CO1 Understand the nature, scope and historical development of Political Geography
- CO2 Get knowledge about Evolution of states & nations.
- CO3 Understand the frontiers and boundaries
- CO4 Get knowledge of Geopolitical theories.
- CO5 Investigate the problems and disputes in India
- CO6 Understand about the Electoral Geography.

### **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.: Economic Geography**

- CO1 Understand the nature, scope branches and approaches of Economic Geography
- CO2 Know the human economic activities
- CO3 Understand the mineral resources and industrial development
- CO4 Understand the Weber's industrial location theory
- CO5 Understand the importance and pattern of transport and international trade
- CO6 Understand the levels of economic development, Special Economic Zones and related issues in India.

### **Course (Paper) Name and No.: Biogeography**

- CO1 Understand the nature, scope, branches and approaches of Biogeography.
- CO2 Understand the ecosystem and biosphere.
- CO3 Understand the community and classification of plants.
- CO4 Understand the marine biogeography
- CO5 Understand the types, importance, loss and conservation of biodiversity.

### **Course (Paper) Name and No.: Social Geography**

- CO1 Understand the nature, scope, and concept, relationship between culture and social environment.
- CO2 Understand the race, religion, language and tribes in India and the world.
- CO3 Understand the social groups and its segregation.
- CO4 Understand the contemporary social issues in India.

### **Course (Paper) Name and No.: Geography of Transport**

- CO1 Understand the concept, nature, scope and significance of Transport Geography.
- CO2 Understand the transport network system.
- CO3 Understand the evolution and pattern of modes of transport.
- CO4 Understand the models about the transport.
- CO5 Understand the issues of transportation in India.

## **Course (Paper) Name and No.: Research Methodology in Geography**

- CO1 Students will be able to understand the concept, types and stages in the research methodology, formulation of research and research design.
- CO2 Students will know methods of data collection and its processing and role of internet in research.
- CO3 Students will be able to prepare the hypothesis and also be able to do the hypothesis testing by using computer and statistical techniques.
- CO4 Students will be able to spatial and non-spatial data analysis in GIS software's and competent for research writing.
- CO5 Students will be able to prepare the research report on any one theme in Physical Geography or Human Geography

# 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

## Course Outcomes

### Class: F.Y.B.A. (History)

#### Semester I

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

- CO1 The Learners will be able to understand the Modern History with regards to the struggles that their forefathers had undertaken to break the fetters of British Slavery.
- CO2 The Learners will get well acquainted with the significant events, Freedom fighters, personas, political movements in the History of Modern India.
- CO3 The Learners can envisage the whole process of Freedom struggle and learn from the mistakes in the past.
- CO4 Learners will acquire an intensive and rare understanding of landmarks events and personality

#### Semester II

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

- CO1 To study how the seeds of Nationalism were sown in the Socio-Religious Reform Movements
- CO2 Educational Development has enabled learners today to taste its sweet fruits
- CO3 Learners will comprehend about the impact of the British Rule on Indian Economy.
- CO4 To study the development of Subaltern factors in the History of Modern India

## **Class: S.Y.B.A. (History)**

### **Semester III**

#### **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**

- 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

### **Semester IV**

#### **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 res
- 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

## **Class: T.Y.B.A. (History)**

### **Semester V**

#### **Course (Paper) Name and No.: History of Medieval India**

- CO1 The students will learn the Sultanate rule and the history of Vijaynagar 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**

- 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 19<sup>th</sup> century.
- CO4 Political history of Maharashtra can be stressed

#### **Course (Paper) Name and No.: Introduction of Archaeology**

- CO1 The learners will acknowledge about Archeology 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 reorganization of history.
- CO4 They will know opportunities in field of Archeology

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

- CO1 Students will learn significance of regional history.
- CO2 It will enhance their perception of 17th century India in context of Maratha history
- CO3 They will know the process of consolidation of Maratha Empire and successor of Shivaji Maharaj.
- CO4 Understand how the administrative system of Royal Period is useful in present time

### **Course (Paper) Name and No.: History of Contemporary World**

- 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 20<sup>th</sup> century.

### **Course (Paper) Name and No.: Research Methodology and Sources of History**

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

## **Semester VI**

### **Course (Paper) Name and No.: History of Medieval India**

- 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 & contemporary India (1947-2000)**

- 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**

- 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, 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 to 1818 CE)**

- CO1 Students will be able to analyze 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**

- CO1 The students will get knowledge of transformation of china under Mao Zedong and deng Xiaoping.
- CO2 They will understand the reconstruction of Japan and major trends that emerge in Asia.
- 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.: Research Methodology and Sources of History**

- CO1 Students will understanding and aware of historical research.
- CO2 Students will understand 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

# Department of Marathi

## Course Outcomes

### Class: F.Y.B.A. (Marathi)

#### Semester I

##### 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 वाङ्मय प्रकाराची ओळख होईल
- CO3 विद्यार्थ्यांला वास्तव आणि नाटक यातील फरक समजेल
- CO4 मराठी साहित्यातील नाटककारांचा परिचय होईल

#### Semester II

##### 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 वाङ्मय 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

## Class: S.Y.B.A. (Marathi)

### Semester III

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

- CO1 कादंबरी या साहित्यप्रकाराची तोंडओळख होईल
- CO2 विद्यार्थ्यांच्या वाङ्मयीन 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

### Semester IV

#### 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

# **Department of Rural Development**

## **Course Outcomes**

### **Class: F.Y.B.A. (Rural Development)**

#### **Semester I**

#### **Course (Paper) Name and No.: Introduction to Rural Development I**

- CO1 Learners will get different aspects of Rural Development.
- CO2 Learners will understand the nature, features and problems of Rural Society in India.
- CO3 Learners will know the concept of Rural Social Institution.
- CO4 Learners will understand the concept and obstacles in Social Change

#### **Semester II**

#### **Course (Paper) Name and No.: Issues related to Rural Development II**

- CO1 Learners will acquire deeper and more inclusive understanding about functions of Rural Governance in Maharashtra.
- CO2 Learners will occur to Rural Economy.
- CO3 Learners will know the role of Rural Infrastructure in Rural Development.
- CO4 Learners will be aware about the Key Issues of Rural Communities.

## **Class: S.Y.B.A. (Rural Development)**

### **Semester III**

#### **Course (Paper) Name and No.: Rural Society III**

- CO1 Learners will know the components of Indian Rural Society and problems of weaker section.
- CO2 Learners will understand the Rural Institutional System.
- CO3 Learners will be familiar with the process of social change.
- CO4 Learners will be acquaint to the concept of Modernization, Westernization and Sanskritization

#### **Course (Paper) Name and No.: Rural Administration IV**

- CO1 Learners will get the role and basic concept of District Administration.
- CO2 Learners will know the components of Revenue Administration.
- CO3 Learners will be familiar with Law and Order Administration and Judicial Machinery.
- CO4 Learners will understand the concept of Planning.

### **Semester IV**

#### **Course (Paper) Name and No.: Development Strategies V**

- CO1 Learners will understand the Agricultural Policy, Water Management and functions Agricultural Universities.
- CO2 Learners will understand the to various sources of Rural Employment.
- CO3 Learners will get exposure about Tourism Development for rural area.
- CO4 Learners will get to know the areas of Rural Upliftment.

## **Course (Paper) Name and No.: Laws related to Rural Development VI**

- CO1 Learners will get to know the laws related to Panchayat Raj in Maharashtra.
- CO2 Learners will understand the Land Reform Legislation.
- CO3 Learners will be acquaint to the laws related to rural area.
- CO4 Learners will know the laws related to Tribal area.

# Department of Political Science

## Course Outcomes

### Class: F.Y.B.A. (Political Science)

#### Semester I

##### Course (Paper) Name and No.: Indian Political System

- CO1 Students will find about the important role played by the constitution in making of today's modern India.
- CO2 Identify and explain the central and state institutions, procedures and decision-making processes of the Indian political system.
- CO3 will help to develop deeper understanding of the institutions, processes and services of state and local self govt.
- CO4 Analysing the influence of media on political institutions and the public.

#### Semester II

##### Course (Paper) Name and No.: Indian Political Process

- CO1 To evaluate the evolution, functioning and consequences of political parties in India.  
To identify how electoral rules and procedure in India effect election outcomes.
- CO2 Identify the central and state institutions, procedures and decision-making processes of the Indian political system.
- CO3 Help to develop deeper understanding of the institutions, processes and services of state and central government.
- CO4 Analyzing the influence of caste and reservation, media, social movement on political institutions and the public.

## **Class: S.Y.B.A. (Political Science)**

### **Semester III**

#### **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 Analyzing 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).

## Semester IV

### **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.

# 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 be 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.

## Course Outcomes

### Class: M.A. I (English Literature)

#### Semester I and II

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

- CO1 To understand importance of classical critical theories and its application.
- CO2 To recognize the relationship between literary theories and literature.
- CO3 To develop interpretative and evaluative skills amongst the students.
- CO4 To make the students at ease while learning critical theories.
- CO5 To empower the students with the skill of appreciation of different genres of English literature.

#### Course (Paper) Name and No.: Linguistics and Stylistics Analysis of the Text II

- CO1 To write clearly, coherently and effectively about various genres of literature.
- CO2 To identify different styles used in literature.
- CO3 To develop sound knowledge about phonetics and its applications.
- CO4 To strengthen communication skills of the students.
- CO5 To recognize the relationship between language and literature.

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

- CO1 To understand different types of fiction and its themes.
- CO2 To recognize the culture and context of the work of literature.
- CO3 To appreciate narrative techniques used in the novels.
- CO4 To explore various elements of novel reflected in literature
- CO5 To examine universal values incorporated in various fictions.

## **Course (Paper) Name and No.: Drama IV**

- CO1 To identify different types of dramas.
- CO2 To recognize theatrical devices employed in the play.
- CO3 To appreciate themes and characterization reflected in the drama.
- CO4 To understand nuances of dramatic performances.
- CO5 To understand the relationship between literature and society

## **Class: M.A. II (English Literature)**

### **Semester III**

#### **Course (Paper) Name and No.: Poetry I**

- CO1 To understand importance of poetry as a genre in English Literature
- CO2 To recognize the relationship between nature and poetry
- CO3 To develop the skill of appreciation of different poetic forms amongst the students.
- CO4 To examine the contribution of representative poets of the age or movement.
- CO5 To empower the students to identify moral and social values reflected in English poetry.

#### **Course (Paper) Name and No.: Gendered Perspectives on Literature II**

- CO1 To understand importance gender equality in the real life.
- CO2 To recognize the relationship between society and gender formation
- CO3 To appreciate prominent literary text on the basis of gender perspectives.
- CO4 To examine the status and identity of women in literature as well as society.
- CO5 To practice gender parity in society

#### **Course (Paper) Name and No.: Twentieth Century American Literature III**

- CO1 To understand various thematic concerns reflected in the realm of American Literature
- CO2 To recognize the importance of equality and freedom in the society.
- CO3 To appreciate the style of modern and postmodern American writers.
- CO4 To understand the importance of multiculturalism depicted in the texts.
- CO5 To encourage the students to make presentations on prominent American writers.

### **Course (Paper) Name and No.: Shakespeare IV**

- CO1 To understand various thematic concerns reflected in the masterpieces of Shakespeare.
- CO2 To identify effective use of iambic pentameter in the works of Shakespeare.
- CO3 To appreciate the tragedies, comedies and historical plays of William Shakespeare.
- CO4 To understand the contribution of William Shakespeare as a Sonneteer.
- CO5 To examine how everybody is playing the role of Hamlet in one's life.

### **Class: M.A. II (English Literature)**

### **Semester IV**

### **Course (Paper) Name and No.: Indian Writing in Translation I**

- CO1 To understand various thematic concerns reflected in Indian Writing in Translation.
- CO2 To enable the students to delve deep in Indian literature in translation.
- CO3 To examine the nature of Indian ethos reflected in the various Indian languages.
- CO4 To understand the contribution of prominent writers in the realm of Indian languages.
- CO5 To empower the students to overcome the challenges of literary translation.

### **Course (Paper) Name and No.: Research Methodology II**

- CO1 To understand the importance of research in the process of learning.
- CO2 To acquire the interpretative and analytical skills during the process of research.
- CO3 To understand the process of research systematically and successfully.
- CO4 To enable the students with various conventions of documentation.
- CO5 To undertake research in English and become successful researcher.

### **Course (Paper) Name and No.: Political Reading of Literature III**

- CO1 To understand various nuances of power politics present in the literary texts.
- CO2 To examine the dominant ideology reflected in the realm of literature.
- CO3 To understand the mechanism of power politics and its implementation.
- CO4 To empower the students with the skill of coping with the power politics.
- CO5 To identify the power politics present in the literary works as well as real life.

### **Course (Paper) Name and No.: Project Writing IV**

- CO1 To familiarize the students with mechanism of writing a Research Project.
- CO2 To acquire the skill of data collection and its analysis in the process of research.
- CO3 To understand the process of research design systematically and convincingly.
- CO4 To enable the students with the process of chapterization in the body of the Research Project.
- CO5 To empower the students to complete the Research Project in English Literature successfully.

# Department of Economics

## Programme Specific Outcomes

- PSO1 Learners will be 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.

## Course Outcomes

### Class: M.A. I (Economics)

#### Semester I

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

- CO1 Learners will understand how consumer manages behavior in the market.
- CO2 Learners will get an idea about the production function and its return to scale.
- CO3 Learners will be trained to decide cost of production in various trends.
- CO4 Learners will know how price and output determines in perfect competition.
- CO5 Learners will develop to the reality of welfare economics.
- CO6 Learners will be able to understand concepts of Production, Cost and Supply

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

- CO1 Learners will get with concepts of Macroeconomic Accountings.
- CO2 Learners will understand the Advance concepts of determination of National Income.
- CO3 Learners will able to know that how inflation affects economy.
- CO4 Learners will get knowledge of advanced features of open economy with applications.
- CO5 Learners will get an idea about monetary and fiscal policy.
- CO6 Learners will know the Micro foundations of Macroeconomics

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

- CO1 Learners will understand development in economic thought.
- CO2 Learners will trained to measure different aspects of economic indicators.
- CO3 Learners will get with various modern growth and development models.
- CO4 Learners will know the concepts of credit, land, labor, capital, microfinance etc.).
- CO5 Learners will study Concepts of Environment, natural resources, financial institutions, trade, foreign exchange etc.
- CO6 Learners will get exact idea about the role of international institutes in development.

### **Course (Paper) Name and No.: Statistical Methods in Economics-IV**

- CO1 Learner will know the basics of probability and variable.
- CO2 Learner will get ideas of how to test the hypothesis in the research work.
- CO3 Learner will understand the Concept of simple linear regression analysis.
- CO4 Learner will understand the use of linear regression analysis and its problems.
- CO5 Learners will get idea about R Square.
- CO6 Learners will get idea about autocorrelation.

## **Semester II**

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

- CO1 Learners will get knowledge about game theory and different concepts.
- CO2 Learners will understand different models of oligopoly.
- CO3 Learners will be aware about Monopoly Market.
- CO4 Learners will know how asymmetric information works in market.
- CO5 Learners will know how different theories work in different economy.
- CO6 Learners will know about different aspects of the firm.

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

- CO1 Learners will understand the Price Mechanism with practical examples.
- CO2 Learners will be able to know the credit control methods of RBI.
- CO3 Learners will understand the wealth effects and the government Budget constraints.
- CO4 Learners will get with Keynesian theory.
- CO5 Learners will understand the Business cycles.
- CO6 Learners will know how banking system works.

### **Course (Paper) Name and No.: Public Economics-III**

- CO1 Learners will understand Welfare Economics.
- CO2 Learners will aware with the tax system and social choices.
- CO3 Learners will get an idea about Governments rationale public expenditure.
- CO4 Learners will study tax regulation, distribution, implication and tax evasion.
- CO5 Learners will study India's federal structure.
- CO6 Learners will familiar with new concepts of Tax.

### **Course (Paper) Name and No.: Mathematical Techniques for Economists IV**

- CO1 Learner will able to understand the basic set theoretic operations.
- CO2 Learners will aware about logarithms.
- CO3 Learner will understand the concept of derivatives and its application in economics.
- CO4 Learners will introduce with integration and its applications.
- CO5 Learner will understand the application of constrained optimization in economics.
- CO6 Learner will understand the use of matrices in economics subject.

## **Class: M.A. II (Economics)**

### **Semester III**

#### **Course (Paper) Name and No.: Economics of Agricultural production and Rural Markets-I**

- CO1 Learners will understand production relationships and input uses.
- CO2 Learners will aware about how agricultural instability creates problems.
- CO3 Learners will get with rural credit markets and its segmentation.
- CO4 Learners will understand concepts of work, skill and productivity in labour market.
- CO5 Learners will know about the wages.
- CO6 Learners will learn various types of farming and formal and informal lease.

#### **Course (Paper) Name and No.: Economics of Labour Markets-II**

- CO1 Learners will understand the nature and cost of labour.
- CO2 Learners will learn the theory of labour demand.
- CO3 Learners will aware about the theory of labour supply.
- CO4 Learners will know wage issues in labour markets.
- CO5 Learners will get with the labour market in India.
- CO6 Learners will understand the different factors related to labour market.

#### **Course (Paper) Name and No.: Trade Unions and Industrial relations in India-III**

- CO1 Learners will understand economics of trade unions.
- CO2 Learners will aware about the different approaches of industrial relations.
- CO3 Learners will understand the structure of Trade Unions.
- CO4 Learners will know various disputes and its consequences.
- CO5 Learners will get with policy framework for labours.
- CO6 Learners get with new changes in the labour policy.

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

- CO1 Learners will study the economic growth and its environmental impacts.
- CO2 Learners will get with types of goods.
- CO3 Learners will be aware about the role of institution in environmental protection.
- CO4 Learners get with supplementary analytical tools.
- CO5 Learners will get idea about environmental issues.
- CO6 Learners will get knowledge of Environmental policy and practices

## **Semester IV**

### **Course (Paper) Name and No.: Economics of Human Development-I**

- CO1 Learners will study basic need approaches in human development.
- CO2 Learners will get the idea about millennium development goals.
- CO3 Learners will understand various concepts like Empowerment, Equity, Sustainability, Security, Productivity etc.
- CO4 Learners will get the basic tools of growth indices.
- CO5 Learners will understand concepts of human development.
- CO6 Learners will study various aspects of social security.

### **Course (Paper) Name and No.: Industrial Economics-II**

- CO1 Learners will understand the various theories of the firms.
- CO2 Learners will get understand Technical change.
- CO3 Learners will know that how firm adopts technical change.
- CO4 Learners will understand financial aspects of firms.
- CO5 Learners will get the history of development of Indian Industries.
- CO6 Learners will understand the role of public enterprises in economy.

### **Course (Paper) Name and No.: Agricultural Development and policy-III**

- CO1 Learners will get with various theories of agricultural development in the world.
- CO2 Learners will able to understand food security and sustainable agricultural development.
- CO3 Learners will get aware about efficiency of agricultural market in India.
- CO4 Learners will know global trends in market and its implications.
- CO5 Learners will know the agricultural policy.
- CO6 Learners will get the idea about the trends in India's export and import.

### **Course (Paper) Name and No.: Project**

- CO1 Learners will get with nature and scope of research in economics.
- CO2 Learners will understand various types of research design.
- CO3 Learners will understand methods of data collection and presentation and elementary analysis data.
- CO4 Learners will study index numbers.
- CO5 Learners will study different methods of testing hypothesis.
- CO6 Learners will study how to write a report

# 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.

## Course Outcomes

**Class: M.A. I (Hindi)**

**Semester I and II**

### **Course (Paper) Name and No.: History of Hindi Literature ( Adhunik kal ), Paper-I and 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-III and 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-5 and 6**

- 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 and 8**

- 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.

## **Class: M.A. II (Hindi)**

### **Semester III**

#### **Course (Paper) Name and No.: Modern Prose, Paper-9**

- CO1 Understanding the vision of Premchand about middle class and his concern for strengthening the freedom movement in India through Godan novel.
- CO2 Understanding the cultural consciousness of Hazariprasad Dwivedi.
- CO3 Understanding the thoughts of Aadhe Adhoori by Mohanrakesh about modern society.
- CO4 Understanding poetry about social issues, humanity, politics.

#### **Course (Paper) Name and No.: Modern Poetry, Paper-11**

- CO1 Describing the poems of Agye in context with his experience of life.
- CO2 Indian politics through poems compiled in poetry collection by Dhumil.
- CO3 Understanding the current situations through modern poems
- CO4 To develop the ability to taste and review the composition
- CO5 Getting introduction to Modern Poetry

#### **Course (Paper) Name and No.: Vishesh Adhyayan: Marathi Santon ka hindi kavya, Paper-13**

- CO1 Introducing the Hindi poetry of Marathi saints
- CO2 Getting to know Marathi saints
- CO3 To make aware of the culture of Maharashtra through the poetry of Marathi saints
- CO4 Introducing humanity to the message through the poetry of Saint Tukaram Saint Namdev
- CO5 Introducing the concept of Vaidev family
- CO6 Introducing to the personality and gratitude of the saints of Maharashtra

### **Course (Paper) Name and No.: Functional Hindi, Paper-15**

- CO1 Understanding the meaning, concept and importance of Functional Hindi.
- CO2 Understanding various forms of Functional Hindi according to its area of application.
- CO3 Understanding the concept of translation
- CO4 Introducing the concept of advertising
- CO5 Getting an introduction to the international form of Hindi

## **Semester - IV**

### **Course (Paper) Name and No.: Modern Prose, Paper-10**

- CO1 Understanding the personality and personality of Dr. Babasaheb Ambedkar through the novel
- CO2 Getting an introduction to the life of a Hindi novelist
- CO3 To introduce students to the problems of blind people of the world through Hindi drama
- CO4 To understand elemental discussion of novels and plays
- CO5 To introduce Indian culture, humanism, ethnicity and family life through Hindi stories

### **Course (Paper) Name and No.: Modern Poetry, Paper-12**

- CO1 Describing the poems of Agye in context with his experience of life.
- CO2 Indian politics through poems compiled in poetry collection by Dhumil.
- CO3 Understanding the current situations through modern poems
- CO4 To develop the ability to taste and review the composition
- CO5 Getting introduction to Modern Poetry

### **Course (Paper) Name and No.: Mass Media, Paper-14**

- CO1 Getting a general introduction to Hindi mass media
- CO2 Understanding the process of communication and its elements
- CO3 Introducing the role of mass media in social development
- CO4 To convey mass media
- CO5 Introducing the development of mass media
- CO6 To make aware of the types of medial writing

### **Course (Paper) Name and No.: Project writing, Paper-16**

- CO1 Study the method of research
- CO2 Be familiar with the elements of research
- CO3 Understanding the research framework
- CO4 To know the dimensions of research
- CO5 Understanding the method of subject selection

# **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 Commerce

## Course Outcomes

Class: F.Y.B. Com.

### Semester I

#### Course (Paper) Name and No.: Commerce I

- CO1 Better understanding of Business concepts
- CO2 Understanding impact of Environment on Business
- CO3 Understanding concept of Project planning
- CO4 Awareness of Entrepreneurship as Career option

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

- CO1 Learner understand the practical applications of Indian Accounting Standards no-1,2 and 9
- CO2 Learners understand the differences between Capital and Revenue expenditure and Receipts.
- CO3 Learners learn to keep books in departmental accounting system.
- CO4 Learners become aware about the practical application of Pass Book and cash book transactions

#### 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 Theoretical concept relating Mathematics and Statistics
- CO2 Shares and Mutual Funds,
- CO3 Permutation Combinations,
- CO4 Measures of central tendencies, Dispersion, Correlation and Regression, sources of data, classification of data,
- CO5 Index Number, Probability, Probability Distribution etc. It will further help to apply the statistical tools and techniques for decision making and for research studies.

## Semester II

### Course (Paper) Name and No.: Commerce II

- CO1 Understanding the service sector.
- CO2 Better Knowledge about banking and retailing sector.
- CO3 Understanding various aspects of E-Commerce.
- CO4 Awareness about new trends in Banking sector

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

- CO1 Learners are able to know single entry system and conversion method.
- CO2 Learners are able to know concept of consignment, Procedure of consignment, accounting of consignment and stock valuation
- CO3 Learners are able to know the concept of Branch, Dependent Branches, Debtors system and stock debtor system.
- CO4 Learners are be able to know computer system, Components of Computer, Importance of Computer and limitations of computer in Accountancy.

### 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.
- CO5 To understand the importance of presentation and interview skills.

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

- CO1 Concept of Functions, Derivatives and Their Applications.
- CO2 Concept of Interest and Annuity
- CO3 Understood the tools and techniques like measures of Bivariate Linear Correlation and Regression
- CO4 Critical decision making and in Time series, Index Numbers,
- CO5 Solving the problems of elementary probability distributions

## **Class: S.Y.B. Com.**

### **Semester III**

#### **Course (Paper) Name and No.: Commerce III**

- CO1 Understanding about conceptual knowledge and evolution of management.
- CO2 Awareness about the functions of management.
- CO3 Developing the skills of decision making.
- CO4 Better understanding about aspects of organizing.
- CO5 Developing the skills of controlling.

#### **Course (Paper) Name and No: Accountancy & Financial Management III**

- CO1 Student will able to understand or gain the knowledge of admission or retirement /death of a partnership
- CO2 Student will able to understand analysis how piecemeal distribution of cash after dissolution of partnership firm
- CO3 Student will able to understand how old firm merge with new firm
- CO4 Student will able to understand how partnership firm converted into a ltd co.

#### **Course (Paper) Name and No: Financial Accounting and Auditing – Management Accounting**

- CO1 Student will able to understand analysis and interpretation of financial statement.
- CO2 Student will able to understand Balance sheet ratio, revenue ratio and combined ratio.
- CO3 Student will understand projection of working capital requirement in case of trading and manufacturing organization.
- CO4 Students will understand capital budgeting techniques – payback period, Accounting rate of return, Net present value, profitability index

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

- CO1 To understand the basic concepts of Macro Economics.
- CO2 To understand certain common features of economic phenomenon in the real world.
- CO3 To integrate the concepts of macroeconomics in order to analyze and understand the policies of the state
- CO4 To integrate the concepts of macroeconomics in order to analyze and understand the functioning of the economy

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

- CO1 Understanding of evaluation and classification of advertising.
- CO2 Developed skills required for career in advertising.
- CO3 Understanding economic & social aspects of advertising.
- CO4 Understanding of Brand building & Special purpose advertising & trends in advertising.

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

- CO1 Better understanding of Contract act 1872.
- CO2 To be aware of the legal impact of contracts in business.
- CO3 Understanding the concept of special contract.
- CO4 Better understanding of sale of goods act, Negotiable Instruments act and Information Technology act.

### **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 Understanding about conceptual knowledge of production and Finance.
- CO2 Awareness about the production management and Inventory management.
- CO3 Better knowledge towards Quality management.
- CO4 Better understanding about various aspect of Financial System.
- CO5 To update the learners with the recent trends in Finance.

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

- CO1 Student will able to understand or gain the knowledge of company A/c , issue of Shares or debenture
- CO2 Student will able to understand the provision of companies Act regarding redemption of preference shares
- CO3 Student will able to understand the provision of companies Act regarding redemption of preference shares
- CO4 Student will able to understand after incorporation and how allocated income & expenses.

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

- CO1 Student will able to understand principles of auditing.
- CO2 Student will able to understand audit planning, audit program, audit working papers .
- CO3 Student will understand audit sample, test check, internal control.
- CO4 Students will understand audit income, audit of expenditure, audit of assets book debts and audit of liabilities

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

- CO1 To understand the basic concepts of public finance
- CO2 To understand the role of state in an economy.
- CO3 To know the fiscal policy of the state.
- CO4 To understand the structure of fiscal federalism in India.

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

- CO1 Better understanding of media in advertising.
- CO2 To develop understanding of advertising budget & planning in advertising.
- CO3 Understanding the importance of creativity aspects of advertising.
- CO4 Understanding measuring the effectiveness of advertising.

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

- CO1 Awareness about the various companies rules and regulations.
- CO2 Understanding of Formation, dissolution & working of partnership firm and provisions of act.
- CO3 Understanding the concept of consumer rights and Consumer protection act.
- CO4 Better understanding of 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 Enable the student to comprehend the concepts of marketing
- CO2 Be familiar with the basic elements of marketing mix
- CO3 Evaluate the key marketing dimensions for decision making
- CO4 Prepare the skill sets required for a career in marketing
- CO5 Understanding the importance of ethics in marketing

#### **Course (Paper) Name and No.: Financial Accounting and Auditing Paper VII**

- CO1 Learners are able to understand Revised Schedule VI, Financial Statement as per the Revised Schedule.
- CO2 Learners are able to understand the concept of internal Reconstruction, Legal aspects of Internal Reconstruction, Accounting Procedure, to draw Balance sheet if a company after reconstruction.
- CO3 Learners are able to understand the concept of Buyback of Shares, Conditions of Buyback, Methods of Buyback and accounting of Buyback.
- CO4 Learners are able to understand why investments are made, types of investments, accounting for investments

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

- CO1 Understanding of different concepts of Cost Accounting.
- CO2 Understanding and problem solving on material cost.
- CO3 Understanding and problem solving on Labour cost.
- CO4 Understanding and problem solving on overheads cost.
- CO5 Understanding and problem solving on cost Sheet.

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

- CO1 Learners learn the overall macroeconomic environment in India.
- CO2 Learners learn the policy structure in agriculture sector in India.
- CO3 Learners learn the industry and services sector the Indian economy.
- CO4 Learners studied the banking and financial markets in India.

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

- CO1 Comprehend the concepts of marketing research
- CO2 Enable the student to undertake marketing research
- CO3 Evaluate the various sources of data collection
- CO4 Familiar with data processing, analysis and reporting
- CO5 Integrating the use of technology in data collection and analysis

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

- CO1 Learners will able to understand importance of Export Marketing.
- CO2 Learners will able to understand various Economic Grouping of the world, and trade barriers.
- CO3 Learners will understand New Foreign trade Policy 2015-20 & benefits to status holder.
- CO4 Learners will understand financial incentives available to Indian Exporter.

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

- CO1 Student will able to understand the basic concept of taxation
- CO2 Student will able to understand the legal status of persons
- CO3 Student will able to understand the concept of salaries, Income from properties, profit & gain from business, capital gain etc
- CO4 Student will able to understand deduction from gross total income (S.80A,80C,80CCC,80D,80DD, 80E, 80U,80TT)
- CO5 Student will able to understand total income for individual

## Semester VI

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

- CO1 Develop the understanding of the concepts of Human Resource Management
- CO2 Be familiar with the various aspects of Human Resource Development
- CO3 Develop an understanding of the importance of Human relations
- CO4 Evaluate and understand the various aspects of leadership, motivation, employee morale, employee grievance and their effective management in organizations
- CO5 To integrate the knowledge of the concepts of Human Resource Management to take correct business decisions.

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

- CO1 Learners are able to understand concept of amalgamation, Meaning of Purchase Consideration, Methods and AS-14
- CO2 Learners are able to understand foreign currency transactions, need for conversion, recognition of exchange differences and accounting.
- CO3 Learners are able to understand concept of liquidation, modes of liquidation and procedure of liquidation.
- CO4 Learners are able to understand concept of Underwriting, determination of liabilities and underwriting commission.
- CO5 Learners are able to understand concept of LLP, Formation and Accounts of LLP.

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

- CO1 Understanding and problem solving Cost Control Accounts.
- CO2 Understanding and problem solving on Contract costing and Process costing
- CO3 Understanding and problem solving on Marginal Costing and Standard Costing.
- CO4 Understanding of emerging trends of Cost Accounting.

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

- CO1 Learners learn the theories international trade.
- CO2 Learners learn various aspects of commercial policy.
- CO3 Learners studied the structure of balance of payments and World trade Organization.
- CO4 Learners studied the foreign exchange market.

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

- CO1 Understand the concepts of application of marketing research
- CO2 Enable the student to gain knowledge about various aspects of application of marketing research
- CO3 Evaluate the in house and professional marketing research agencies
- CO4 Familiar with prominent marketing research agencies
- CO5 Developing the skill to undertake small projects of marketing research

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

- CO1 Learners will able to understand factors determining export price .Need for labelling and export marketing.
- CO2 Learners will understand factors influencing distribution channels, components of logistics and sales [promotion techniques.
- CO3 Learners will able to understand methods of payment in export marketing. Role of commercial bank, EXIM, SIDBI in financing exporters, ECGC.
- CO4 Learners will understand registration with different authorities, shipping and custom stage formalities

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

- CO1 Student will able to understand the basic concept of GST
- CO2 Student will able to understand the scope of supply, Mixed Supplies Composition Levy etc.
- CO3 Student will able to understand the concept of Time, Place & Value of supply
- CO4 Student will able to understand eligibility for taking Input Tax Credit
- CO5 Student will able to understand Registration, Procedure& cancellation of under GST Law

# 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.

## Course Outcomes

### Class: F.Y.B. Com. (Accounting and Finance)

#### Semester I

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

- CO1 To make effective and impressive communication.
- CO2 To make communication in ethical manner.
- CO3 Capable to make persuasive digital communication.
- CO4 Capable to make abstract and summaries.
- CO5 Better presentation and communication using proper body language.
- CO6 Helps to understand and learn provisions as per Accounting Standards issued by ICAI

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

- CO1 Define the various components of total cost of a product i.e. direct & indirect cost & fixed & flexible cost.
- CO2 Determine basis for computing tender price, EOQ & Stock Level.
- CO3 Use method of time keeping & time booking & overtime, etc, valuation of Employee cost and Overheads Cost
- CO4 Helps to understand and learn provisions as per Accounting Standards issued by ICAI

#### Course (Paper) Name and No.: Commerce I

- CO1 Demonstrate the basic understanding of business management.
- CO2 Explain financial concept used in making business decision.
- CO3 Use business terms and concepts when communicating.
- CO4 Explain the techniques of SWOT analysis.
- CO5 Utilize information by applying a variety of business and industry software and hardware to major business functions.

### **Course (Paper) Name and No.: Economics –I**

- CO1 Learners will understand the concepts related to business and its applications.
- CO2 Help the learners to understand the fundamentals of demand and supply.
- CO3 Learners will be able to understand how household and business interact in various market structures.
- CO4 Learners will understand various cost and pricing methods used in the market.
- CO5 It will help the learner to understand different types of market in the economy.

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

- CO1 Learners can be able to make necessary journal entries under hire purchase system
- CO2 Understanding for calculation of interest charged by hire vendor
- CO3 Maintain the financial statement of the business entity
- CO4 Helps to understand the final accounts of manufacturing concern
- CO5 Learners learnt maintaining the records of inventory according to the methods of valuation
- CO6 Helps to understand and learn provisions as per Accounting Standards issued by ICAI.

### **Course (Paper) Name and No.: Financial Management I**

- CO1 Use business finance terms and concepts while communicating.
- CO2 Explain the financial concepts used in making financial management decisions.
- CO3 Demonstrate a basic understanding of financial management.
- CO4 Demonstrate and understanding the overall role & importance of the finance function.

## Semester II

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

- CO1 Improve the confidence level of students to face the crowd while giving the presentation.
- CO2 Awareness about how to prepare for an interview
- CO3 Improve the language skill of students using practical methods.
- CO4 Capable to understand the business communication in the corporates

### Course (Paper) Name and No.: Innovative Financial Services

- CO1 Student will be able to describe the types of equity securities that companies can use to raise equity capital.
- CO2 Student will be able to describe the characteristics of different types of debt securities and be able to price them.
- CO3 Student will be able to describe different theories of how interest rates are determined and explain the relationship between the term to maturity, risk, and interest rates.
- CO4 Students will learn innovational & structural change in financial sector.

### Course (Paper) Name and No.: Business Mathematics

- CO1 Demonstrate an understanding of the foundations and history of mathematics.
- CO2 Perform computations in higher mathematics.
- CO3 Read and understand middle-level proofs.
- CO4 Develop and maintain problem solving skills.
- CO5 Use mathematical ideas to model real-world problems

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

- CO1 Understand difference in between single entry system and double entry system and practically able to linking up, to prepare final accounts from incomplete records.
- CO2 Learn application of branch accounting for small branches by debtor system and for big branches by stock and debtors system.
- CO3 Understand transactions between principal/Manufacture and agent, able to apply consignment accounting regarding these transactions.
- CO4 Know basic principles of insurance and able to calculate fire insurance claim regarding goods lost by fire.

### **Course (Paper) Name and No.: Auditing-I**

- CO1 To understand the principles of auditing and type of audit.
- CO2 Learner will able to understand audit planning, program and working papers.
- CO3 To understand audit sample, test check, internal control.
- CO4 Students will understand usefulness of internal audit, statutory audit.

### **Course (Paper) Name and No.: Business Law I**

- CO1 Learner will able to learn the difference between valid, void and voidable contract.
- CO2 Know the rights and duties under different contract.
- CO3 Learn how to pursue the consumer rights under consumer protection Act 1986
- CO4 The course intended to provide basic understanding of mechanism of business contracts.

## **Class: S.Y.B. Com. (Accounting and Finance)**

### **Semester III**

#### **Course (Paper) Name and No.: Information Technology in Accountancy- I**

- CO1 To learn basics of computer & communication system
- CO2 To learn knowledge data delivery
- CO3 To learn concept of application in business
- CO4 To learn database & storage management
- CO5 To learn various types of memory

#### **Course (Paper) Name and No.: Financial Accounting III**

- CO1 Learners understand the dissolution of firms
- CO2 Got the knowledge of piecemeal distribution of cash for settlement of liabilities
- CO3 Understanding conversion of a firm into a ltd company
- CO4 learners learnt maintaining of accounts in the books of purchasing firm
- CO5 Helps to understand the application of rate for foreign currency into reporting currency

#### **Course (Paper) Name and No.: Taxation II**

- CO1 By the end of the course students will able to describe how the provisions of direct tax laws and to develop a broad understanding of the tax laws & accepted tax practices
- CO2 Students of the course will be able to explain different types of incomes & their tax ability & expenses & their deductibility.
- CO3 Students who complete this course will be able to learn various direct taxes & their implication in practical situations.
- CO4 Students of the course will able to state the use of various deductions to reduce the taxable 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**

- CO1 Define various components of total cost [Direct/Indirect/Fxed/Variable]
- CO2 Determine the various types of centres i.e. cost centres
- CO3 Use cost sheet for computing per unit cost & total cost
- CO4 Determine basis for computing tender price of contract

### **Course (Paper) Name and No.: Business Law-II**

- CO1 It enable learner to appreciate the relevance of business law to individuals & business.
- CO2 Learners are able to identify the fundamental legal principles behind contractual agreements.
- CO3 Learner acquired problem solving techniques and to be able to present coherent, concise legal argument.
- CO4 At the end of the course student will be able to understand basic concepts & laws of Business.

### **Course (Paper) Name and No.: Foundation Course in Financial Market Operations III**

- CO1 Students will able to understand the Australian Banking system & describe the role of regulatory bodies in regulating how banks manage their capital.
- CO2 Students will able to apply different valuation techniques to determine share prices.

- CO3 Students will be able to describe the characteristics of different types of debt securities and be able to price them
- CO4 To understand the functioning of Stock exchange.

## **Semester IV**

### **Course (Paper) Name and No.: Information Technology in Accountancy- II**

- CO1 Learn need & importance of business process, business process management in IT, BPM life cycle
- CO2 Learn practical knowledge of Tally software
- CO3 Learn importance & applications of information system in management, role of computer in MIS
- CO4 Learn different IT auditing techniques

### **Course (Paper) Name and No.: Financial Accounting IV**

- CO1 Learners understanding about final accounts of the companies.
- CO2 Learn about redemption provisions of preference shares and debentures.
- CO3 Work with profit prior to incorporation and post incorporation profits.
- CO4 Understanding the conversion of foreign currency into reporting currency by application of foreign exchange rate.

### **Course (Paper) Name and No.: Taxation III**

- CO1 By the end of the course students will be able to understand Indian Income tax system.
- CO2 Understood fundamental concepts of Indian Income tax act 1961.
- CO3 Apply Income tax laws and solve the problems.
- CO4 Analyse and evaluate tax information and issues.
- CO5 Communicate effectively and orally income tax act information to income tax issues.

### **Course (Paper) Name and No.: Business Law III**

- CO1 Demonstrate comprehensive and accurate knowledge and understanding of those areas of company law.
- CO2 Read and study primary and secondary sources of company law, with minimal staff guidance; critically analyze, interpret, evaluate and synthesize information from a variety of sources.
- CO3 Critically analyses complex problems in the relation to the regulation of companies, apply the legal principles studied to these problems, evaluate competing arguments
- CO4 To increasing emphasis on adherence to norms of good corporate governance company law.

### **Course (Paper) Name and No.: Research Methodology in Accounting and Finance**

- CO1 Use Literature while preparing for research, research design and further searches.
- CO2 Explain the Research terminologies and methodologies and interpretation, analysis and presentation of report.
- CO3 Demonstrate a basic understanding of Research, Research Design and Report Writing.
- CO4 To understand the calculation of the methodologies in research.

### **Course (Paper) Name and No.: Management Accounting**

- CO1 Understand the concept of management accounting.
- CO2 Analyses and interpret financial statement.
- CO3 Calculate various ratios from financial statement.
- CO4 Do cash flow analysis and manage working capital requirement estimations of the firm

### **Course (Paper) Name and No.: Foundation Course in Introduction to Management**

- CO1 Learner will be able to use business terms and concepts.
- CO2 Learners will understand the financial concepts used in business organization.
- CO3 Learners use effective communication and managerial skills.
- CO4 Demonstrate a basic understanding of business management.

## **Class: T.Y.B. Com. (Accounting and Finance)**

### **Semester V**

#### **Course (Paper) Name and No.: Indirect tax and GST**

- CO1 Students will able to compute the assessable value of transaction related to goods and services.
- CO2 Understand how to calculate GST for various goods and services.
- CO3 Students will able to examine the method of tax credit under GST.
- CO4 To enable the students to learn the concepts of indirect tax & GST from the pre GST to post GST period.

#### **Course (Paper) Name and No.: Financial Management II**

- CO1 Explain the financial concepts used in making financial management decisions.
- CO2 Use effective communication skill to promote respect & relationship for financial deals
- CO3 Use business finance terms and concepts while communicating.
- CO4 Communicate effectively using standard business terminology.

#### **Course (Paper) Name and No.: International Finance**

- CO1 Use international trade terms and concept when communicating.
- CO2 Explain the international trade concept used in making global decision.
- CO3 Demonstrate a basic understanding of international trade.
- CO4 Understand international capital & foreign exchange market.

#### **Course (Paper) Name and No.: Cost Accounting III**

- CO1 Define the process of computation of Total Cost , Process Cost and Inter-process Profit
- CO2 Define the term with regard to Standard Costing and variance analysis.
- CO3 Define the term with regard to Marginal Costing and BEP analysis.
- CO4 Understand the use of integrated accounting system for the concern.

### **Course (Paper) Name and No.: Financial Accounting V**

- CO1 Learn the provisions of the Companies Act, 2013 regarding underwriting of shares, liability of underwriters where shares are fully underwritten or partially underwritten and also Accounting for underwriting of shares & debentures.
- CO2 Learn the provisions of the Companies Act 2013 regarding buyback of securities and accounting treatment.
- CO3 Learn AS 14 and the methods of accounting for Amalgamations, concept of transferee Company and the transferor company, purchase consideration and accounting treatment.
- CO4 Understand the procedure of internal reconstruction, its methods and accounting treatment
- CO5 Understand the procedure of liquidation of companies, its types, accounting treatment

### **Course (Paper) Name and No.: Financial Accounting VI**

- CO1 Use Business Finance terms and concepts while communicating.
- CO2 Explain the Financial terms and interpret to its best for taking financial decisions.
- CO3 Demonstrate a basic understanding of Financial Accounting.
- CO4 To understand the valuation of subjects as per the goodwill of organization.

## **Semester VI**

### **Course (Paper) Name and No.: Indirect tax II**

- CO1 Students will able to compute the assessable value of transaction related to goods and services.
- CO2 Understand legislation and administration of Foreign Trade Policy.
- CO3 Students will able to examine types of refund.
- CO4 To understand the importance of indirect taxes (GST) in the Indian & Global economy & its contribution to the economic development.

### **Course (Paper) Name and No.: Financial Management III**

- CO1 Explain the financial concepts used in making financial management decisions.
- CO2 Utilize information by adopting a variety of business and industry software and hardware to major financial function.
- CO3 Demonstrate a basic understanding of financial management.
- CO4 To study in detail the various tools & techniques in the area of finance.

### **Course (Paper) Name and No.: Security Analysis and Portfolio Management**

- CO1 Describe the steps of the portfolio management process.
- CO2 Make investment policy recommendations, including the determination of an optimal asset allocation.
- CO3 Analyze and evaluate the performance of an investment manager.
- CO4 Analyze bond portfolio management strategies.
- CO5 Explain the concept of market efficiency.
- CO6 Explain how asset prices should be determined according to some of the main financial theories.
- CO7 Explain how derivatives products can be used in portfolio management.

### **Course (Paper) Name and No.: Financial Accounting VII**

- CO1 Prepare final accounts of Electricity companies
- CO2 Prepare final accounts of Co-operative societies
- CO3 Get the knowledge of IFRS its purpose & objectives of financial statements, characteristics, elements & measurement
- CO4 Solve the problems of accounts of Investment Accounting AS-13

### **Course (Paper) Name and No.: Cost Accounting IV**

- CO1 Define the process of budget & use the budgetary control in business organization
- CO2 Prepare standard for material, labour & overheads, sales & calculate the variances & how to take corrective actions
- CO3 Use of marginal costing & with the help of it decision making for organization
- CO4 Understand the use of BP & how it's helpful for organization to determine their current situation.
- CO5 Introduction of emerging cost concepts like activity based costing, target costing etc.

### **Course (Paper) Name and No.: Project Work**

- CO1 Understand the application of published works, learn to balance collaborative and individual work, determine an area of interest in the area of research.
- CO2 Improve the Knowledge in the research skill field, literature review, critical thinking and agility in communication skills.
- CO3 Learn about the application of various statistical tools and techniques for analysing and interpreting the data leads to draw the conclusion of the area of research study.
- CO4 Give the suggestion and recommendation about the research study leads to benefit the society at large.

# 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

## Course Outcomes

**Class: F.Y.B.M.S.**

### **Semester I**

#### **Course (Paper) Name and No.: Introduction to Financial Accounts**

- CO1 Help the learners to understand types of business transactions and various terminologies used in business
- CO2 Students will learn to draw financial statements i.e. Trading, Profit and loss account and balance sheet
- CO3 Help Students to Compare Financial Health of various companies basis their financial statement.
- CO4 Gives students perspective on International Accounting Standards vis-a-vis Indian Accounting Standard
- CO5 Understanding distinction of capital expenditure and Revenue expenditure

#### **Course (Paper) Name and No.: Business law**

- CO1 To enhance the motivation & leadership.
- CO2 To develop team spirit & morale.
- CO3 Demonstrate and understanding of the legal environment of the business.
- CO4 Apply basic legal knowledge to business transaction.
- CO5 Learners will be able to understand few legal terms

#### **Course (Paper) Name and No.: Business Statistics**

- CO1 Learners will be able understand the fundamentals of statistics.
- CO2 Learners will be able to learn different types of data and various methods of collecting the data.
- CO3 Learners will be able to calculate the measures of central tendency and measures of dispersion.

- CO4 Learners will be able to calculate correlation and regression analysis.
- CO5 Learners will be able to calculate time series analysis, probability and index number.

### **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.: Foundation of Human skills**

- CO1 Learners will develop and nurture a deep understanding of personal motivation
- CO2 Learners will develop an understanding of and practice personal and professional responsibility
- CO3 Learners will learn to evaluate and improve upon personal leadership strengths and weaknesses
- CO4 It will help the learner to understand the importance of social responsibility & social ethics
- CO5 Learners will explore, understand, and lead, guided by the values of self-awareness, equity, social justice, inclusiveness, empowerment, collaboration, citizenship

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

- CO1 Learners will understand the concepts related to Business and its applications.
- CO2 Help the learners to understand the fundamentals of demand and supply
- CO3 Learners will gain the knowledge about various production techniques
- CO4 It will help the learners to understand different types of market in the economy.
- CO5 Learners will understand various cost and pricing methods used in the market

## Semester II

### Course (Paper) Name and No.: Principles of Marketing

- CO1 Learners should be familiar with the basic elements of the marketing mix and to provide framework about marketing policies.
- CO2 To know marketing strategies.
- CO3 Establish best practice for innovation among learners.
- CO4 To gain acceptance of Market changes.
- CO5 Helps to sustain Change.

### Course (Paper) Name and No.: Industrial Law

- CO1 Be familiar with the general approaches to the study of law and legal reasoning.
- CO2 Demonstrate familiarity with the rules of professional ethics
- CO3 To learn the laws relating to industrial relations, Social security and working Conditions
- CO4 To know the development and the judicial setup of labour laws
- CO5 To learn the salient features of welfare and wage legislations.

### Course (Paper) Name and No.: Business Mathematics

- CO1 The learners will get the knowledge of application of Mathematics in business, finance and economics
- CO2 Learners will learn mathematics of finance concepts like simple interest, compound interest, annuities, etc.
- CO3 Learners will learn economical functions like demand, supply, revenue, cost, profit and other functions.
- CO4 Learners will be able to determine marginal revenue, marginal cost, break even point and elasticity of demand.
- CO5 Learners will learn matrices for making business decisions.

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

- CO1 Develop and deliver informational, persuasive, creative and effective presentations
- CO2 Application of effective business writing
- CO3 Inculcation of interpersonal skills, collaborative skills and team spirit
- CO4 Development of effective communication abilities for career progression purpose and transition to workplace
- CO5 Develop ability to apply critical thinking and behaviour skills in corporate world

### **Course (Paper) Name and No.: Business Environment**

- CO1 Familiarize with the nature of Business Environment and its components.
- CO2 To demonstrate and develop conceptual framework of Business Environment and generate interest in International Business.
- CO3 Understand the concept of Capitalism, Socialism and Mixed Economy.
- CO4 Differentiate between needs and wants of society and can identify how these are satisfied through Business Activities.
- CO5 Overview about impact of technology on business

### **Course (Paper) Name and No.: Principles of Management**

- CO1 Learners will possess knowledge of current theory and techniques of major business discipline.
- CO2 Learners will exhibit leadership capacity and teamwork skills for business decision making.
- CO3 Learners will be able to integrate management practices & management principles.
- CO4 Learners will analyze and understand the environment of the organization.
- CO5 Students will understand theories & philosophy of management & how to apply them in the industry.

## **Class: S.Y.B.M.S.**

### **Semester III**

#### **Course (Paper) Name and No.: Basics of Financial Services**

- CO1 Enable students to understand financial market and its various segments
- CO2 Students get knowledge about functioning and role of financial institutions
- CO3 To familiarize students with fundamentals of banking & banking operations
- CO4 Types and uses of Insurance contracts
- CO5 To impart knowledge about functioning and role of RBI

#### **Course (Paper) Name and No.: Corporate Finance**

- CO1 Learners will learn key concepts of corporate finance and the role of a finance manager.
- CO2 Learners will understand being a manager how an organisation can create shareholders value.
- CO3 Learners will be able to calculate future value and present value of the cash flows.
- CO4 Learners will be able to estimate the company's cost of capital.
- CO5 Learners will be able to value stocks and bonds and assess risk and return of assets

#### **Course (Paper) Name and No.: Consumer Behaviour**

- CO1 Help the learners to develop and understand about the consumer decision making process and its application in marketing function of firms.
- CO2 Learners will learn and develop the skill of understanding and analyzing consumer information to create consumer oriented marketing strategies.
- CO3 Learners will gain the knowledge about the environmental and individual influence on consumer.
- CO4 Learners will learn and understand the importance of consumer behaviour in marketing and differential consumer behaviour in Indian Context.
- CO5 Learners will learn about the different consumer decision making models.

### **Course (Paper) Name and No.: Advertising**

- CO1 This study gives a brief note on introduction to advertising, its evolution, its different types and the ethics and laws used in advertising.
- CO2 This study gives knowledge to the learners about the strategy formulation and planning process in advertising and its role in marketing mix.
- CO3 The study on creativity in advertising helps the learners to design a creative advertisement campaign by making use of the different elements of advertising.
- CO4 The students gain knowledge about the advertising budget, the evaluation process and its current trends.
- CO5 The overall study on advertising helps the learners to understand and examine the growing importance of advertising and career opportunities in advertising.

### **Course (Paper) Name and No.: Recruitment & Selection**

- CO1 Learners will understand process of recruitment & selection & various traditional & modern techniques of recruitment.
- CO2 Learners will be able to list the skills and knowledge needed to conduct full and fair recruitment and selection.
- CO3 Learners will be able to prepare job profile by defining accountabilities, standards and competencies.
- CO4 Learners will be able to understand induction & orientation process & will be prepared for interview effectively.
- CO5 After the successful completion students will understand 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 To enhance the motivation & leadership.
- CO2 To develop team spirit & morale.
- CO3 To encourage individuals in planning & important issues.
- CO4 To meaningful & challenging job.
- CO5 Being a role model to reaching goals.

### **Course (Paper) Name and No.: Information Technology in Business Management-I**

- CO1 The learners will be able to analyse the role played by six major types of information systems in organizations and their relationships to each other.
- CO2 Demonstrate understanding of the concepts, structure and design of different operating systems.
- CO3 Learners will exhibit proficiency in the use of Word processing, spreadsheet and presentation applications.
- CO4 Learners will be able to apprehend the concept and application of E-mail, Internet and Domain Name System.
- CO5 Demonstrate knowledge of security threats to computer systems and perform counter measures to secure it.

### **Course (Paper) Name and No.: Foundation Course(Environmental Management)III**

- CO1 Make deliberate efforts for converting environmental knowledge into action.
- CO2 Develop methods / approaches for sustainable environmental planning, development and management.
- CO3 Understand and practice the legal and regulatory policies with regard to environment protection.
- CO4 Finding solutions to the various environmental problems and challenges faced by us.
- CO5 Integrating environmental and natural resource management with the strategies, operations sand global surveillance of the organisations.

## **Course (Paper) Name and No.: Business Planning & Entrepreneurial Management**

- CO1 Spirit of entrepreneurship will be instilled among the learners. Also they will become familiar to competencies needed to become an entrepreneur
- CO2 Learners will understand the different roles and responsibilities taken by an entrepreneur, challenges faced and opportunities available to them
- CO3 Learners will be able to learn and understand the various concept in the performance management and various evaluation parameters for performance management
- CO4 Learners will be acquainted with different facets of management of an enterprise
- CO5 Leaders with concern towards nation and society at large entrepreneurial approach and skill sets to contribute for socio-economic development

## **Course (Paper) Name and No.: Accounting for Managerial Decisions**

- CO1 Help the learners to present the financial statement which can be analyse and Interpret by using Trend %, Common Size and Comparative
- CO2 Learners will be able to understand the short term capital in the business i.e. Working Capital and able to determine the requirement for the same
- CO3 Understand the Utility of Financial Ratios in any business
- CO4 Learners will be able to determine the cash Inflows and cash Outflows of the business from Operating, Investing and Financing activity
- CO5 Budget is the important part in the business , here learners will learn to prepare Cash Budget of the business by considering actual cash receipt and cash payments

### **Course (Paper) Name and No.: Strategic Management**

- CO1 Learners will get basic idea about business policy and strategies and how does it affect the working of any business organizations.
- CO2 Learners will be able to understand the impact of internal and external environment on strategies of an organization.
- CO3 Learners will get exposure of various corporate, business and functional level strategies.
- CO4 Learners will get a chance to learn various innovative and creative strategy making models.
- CO5 Learners will be able to implement techniques, tools, models and theories of strategic management into practical business world.

## **Semester IV**

### **Course (Paper) Name and No.: Strategic Cost Management**

- CO1 Learners will develop understanding about main elements of Cost
- CO2 Learners will gain accounting knowledge of the Cost sheet to determine the cost incurred for making the product.
- CO3 Learners will gain accounting knowledge of how Industry determines the value of Input units and Finished goods under Process Costing.
- CO4 Learners will develop understanding Marginal costing and standard costing.
- CO5 Overall learners will develop proficiency in the area of Cost accounting.

### **Course (Paper) Name and No.: Corporate Restructuring**

- CO1 Learners will develop understanding about corporate restructuring.
- CO2 Learners will gain accounting knowledge of internal reconstruction.
- CO3 Learners will gain accounting knowledge of external reconstruction.

- CO4 Learners will develop understanding of pre and post impact of reconstruction.
- CO5 Overall learners will develop proficiency in the area of corporate restructuring.

### **Course (Paper) Name and No.: Integrated Marketing Communication**

- CO1 Learners will get an overview of the range of tools available for Marketing Communications.
- CO2 Learners will understand the basic principles of planning and execution in marketing communications.
- CO3 Learners will get acquainted with concepts and techniques in the application for developing and designing an effective advertising and sales promotion program.
- CO4 Learners will develop a managerial perspective and an informed decision-making ability for effective and efficient tackling of promotional situations.
- CO5 Learners will develop an awareness of the connection between marketing communications tools and how each can be used effectively- individually or in an integrated mix

### **Course (Paper) Name and No.: Rural Marketing**

- CO1 Learners will be able to understand the effort put by the government in rural development and the problems in rural market and the ways to overcome it.
- CO2 Learners will gain knowledge about the consumer behaviors in rural areas and their characteristics.
- CO3 Learners will be able to understand the nature of competition in rural markets and the use of marketing mix by manufacturers.
- CO4 Learners will gain knowledge about the various distribution and communication strategies used in rural markets.
- CO5 Learners will understand 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 Learners will understand the process of training & development & the importance of training & development.
- CO2 Learners will be able to understand the counselling techniques with reference to the development of employees, society & Organisation.
- CO3 Learners will be able to evaluate the process of management development.
- CO4 Learners will be able to interpret the process performance management, appraisals& ethics of appraisal.
- CO5 Learners will learn to describe advantages of training & development & will also understand how to undertake training needs analysis.

### **Course (Paper) Name and No.: Change Management**

- CO1 To study innovative Strategies.
- CO2 To empower agents of change.
- CO3 Establish best practice for innovation among learners.
- CO4 To gain acceptance of change.
- CO5 Helps to sustain Change

### **Course (Paper) Name and No.: Information Technology in Business Management**

- CO1 Learners will be to explain various roles MIS have towards strategic goals and operational success of an organization.
- CO2 Recognize the relationship between business information needs and decision making.
- CO3 Examine and identify all components in an ERP system and the relationship among the components.
- CO4 Gain an insight of the basic concepts, scope and application of data warehouse and data mining.
- CO5 Obtain knowledge of BPO/KPO and cloud computing and ability to identify their scope and challenges

### **Course (Paper) Name and No.: Foundation Course (Ethics & Governance) - IV**

- CO1 To know the share holders value for learners.
- CO2 To develop the interest of corporate sector.
- CO3 To understand the rules & regulations of corporate sector.
- CO4 To study about investors.
- CO5 To study fast growth & profit of companies.

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

- CO1 Learners will understand the concepts related to Macro-economics and its applications.
- CO2 Help the learners to understand the fundamentals of National Income.
- CO3 Learners will gain the knowledge about various Monetary Policies.
- CO4 It will help the learners to understand various components of Union Budget
- CO5 To acquaint the learners with various International Trade theories and foreign exchange

### **Course (Paper) Name and No.: Business Research Methods**

- CO1 Learners will be able to understand the concept and process of business research in business environment.
- CO2 Learners will gain knowledge of the use of tools and techniques for exploratory, conclusive and causal research.
- CO3 Learners will be able to understand the concept of measurement in empirical systems.
- CO4 Learners will be able to use statistical techniques for analysis of research data.
- CO5 Learners shall be able to understand the concepts of business research. Enhancing the abilities and imparting the knowledge for using the information in business research area.

## **Course (Paper) Name and No.: Production & Total Quality Management**

- CO1 Learners will be able to understand basics of productivity and total quality management
- CO2 Learners will gain knowledge about various certifications and strategies for quality improvement.
- CO3 Learners will be able to understand the designing of aspects of production systems.
- CO4 Learners will be able to understand various inventory control techniques and materials management.
- CO5 This course will enable the learners apply what they have learnt theoretically.

## **Class: T.Y.B.M.S.**

### **Semester V**

#### **Course (Paper) Name and No.: Investment Analysis & Portfolio Management**

- CO1 Help the learners to understand various Investment avenues available in market.
- CO2 Learners will learn to calculate Return and Risk involved in the securities by using various methods like HPR, Beta etc.
- CO3 Learners will gain the knowledge about Portfolio management and the techniques to manage the Portfolio with the help of graphs by using Fundamental analysis and Returns by using Technical Analysis
- CO4 Learners will learn the traditional theories related to investment and measurement tools for evaluation of portfolio performance
- CO5 This course will provide the overall knowledge about Investment avenues available and Return- Risk Relationship by using various techniques

#### **Course (Paper) Name and No.: Commodity & Derivatives Market**

- CO1 Learners will understand the meaning of financial derivatives.
- CO2 To help the learners understand difference between forward futures and options contracts
- CO3 Be aware about the growth of futures markets worldwide as well as in India.
- CO4 To help the learners understand about the concept of Derivatives and its types
- CO5 To know about Hedging and the development position of Derivatives in India.

#### **Course (Paper) Name and No.: Wealth Management**

- CO1 Provide advice on personal wealth management and pension planning
- CO2 Help learners to understand the role of financial planners
- CO3 Construct a financial plan
- CO4 Assess personal financial goals and create a saving plan
- CO5 Select appropriate Insurance product to cover financial risks

### **Course (Paper) Name and No.: Direct Taxes**

- CO1 Learners will be able to understand basic concepts of direct taxes and its principles.
- CO2 Learners will be able to understand various definitions covered under Income Tax Act, 1961.
- CO3 Learners will be able to determine the residential status of an individual.
- CO4 Learners will be able to compute the scope of income of an individual.
- CO5 Learners will have knowledge of heads of income like Income from Salary, Income from House Property, Profits & Gains from Business & Profession, Capital Gains & Income from Other Sources.

### **Course (Paper) Name and No.: Services Marketing**

- CO1 Learners will be able to understand basic concept of service marketing and how does it differs from product marketing.
- CO2 Learners will be able to analyse impact of service recovery efforts on consumer loyalty.
- CO3 Learners will be able to understand key elements of service marketing mix.
- CO4 Learners will get knowledge about how to manage quality aspects of service marketing.
- CO5 To understand recent trends in marketing of services in various service sector.
- CO6 Learners will understand importance of ethics in service marketing.

### **Course (Paper) Name and No.: E-Commerce & Digital Marketing**

- CO1 Learners gain insight on innovative uses of e-commerce, its significance and application for developing competitive advantage.
- CO2 Learners will gain a comprehensive understanding of the e-commerce landscape, current and emerging business models, the technology and infrastructure underpinnings of the business.
- CO3 Learners gain an understanding on the importance of security, privacy, ethical issues and avenues related to e-commerce.

- CO4 Learners will gain understanding of building blocks that constitute digital marketing and the tools, techniques, knowledge to develop cohesive digital market strategies.
- CO5 Learners gain an understanding on how internet can help business grow and the different e-commerce platforms to enhance current business or incubate new businesses.

### **Course (Paper) Name and No.: Sales & Distribution Management**

- CO1 Learners will gain knowledge about different components of sales and distribution management.
- CO2 Learners will understand various facets of the job of a sales manager.
- CO3 Learners will be able to focus on decision making aspects and implementation of decisions in sales and distribution management.
- CO4 Learners will learn about different performance evaluation techniques their uses, ethics and trends in sales and distribution.
- CO5 Learners will gain knowledge of sales and distribution management and ability of decision-making and implementation of decision in sales and distribution management.

### **Course (Paper) Name and No.: Customer Relationship Management**

- CO1 Articulating CRM goals and identify milestones in relationship management.
- CO2 Bonding with customers and building their loyalty
- CO3 Capability to shift short term customer transactions to a long term relationship mode.
- CO4 Implementation of best CRM strategies and practices.
- CO5 Ability to measure the success of their relationship management efforts.
- CO6 Putting software support in place for providing effective customer services.

## **Course (Paper) Name and No.: Finance for HR Professionals & Compensation Management**

- CO1 Learners will understand the basic compensation concepts and the context of compensation practice.
- CO2 Learners will be able to illustrate different ways to strengthen the pay-for-performance link.
- CO3 Learners will understand the Legally required employee benefits.
- CO4 Learners will Identify the internal and external environmental factors that have an impact on the pay structure of an organization
- CO5 Learners will be able to demonstrate an understanding of the process of designing a pay structure taking account of the company environment

## **Course (Paper) Name and No.: Strategic Human Resource Management & HR Policies**

- CO1 The learners will be able to understand strategic human resource management so as to address business challenges and accomplish organisational goals.
- CO2 Acquaint the students with various HR strategies that create high performance culture within an organization.
- CO3 Make the students understand and assess the importance of strategic human resource management and its correlation with organizational performance.
- CO4 Familiarize students with the Human Resource Policies and its contribution towards workplace harmony.
- CO5 Gain an insight of the changes and developments in strategic human resource management

### **Course (Paper) Name and No.: Performance Management & Career Planning**

- CO1 This study acquaints the learners with a perspective of different facets of management of an enterprise.
- CO2 The study on performance management gives an overview on its features, components, its evolution and the best practices in performance management.
- CO3 The study gives knowledge about the performance management process like performance planning, benchmarking, managing and performance appraisal.
- CO4 The learners gain knowledge about the ethics under performance management and its key issues.
- CO5 This course intends to provide knowledge on career planning and development, its benefits and limitations.

### **Course (Paper) Name and No.: Industrial Relations**

- CO1 The learners will be able to demonstrate descriptive knowledge in the field of Industrial Relations.
- CO2 Apply the essential concepts of Industrial Relations at the organisational level.
- CO3 Understand the genesis of Industrial Disputes & various methods to prevent the same.
- CO4 Analyse how trade unions are helpful in effective communication between the workers and the management through collective bargaining.
- CO5 Familiarize students with the history, provisions of various legislations related to Industrial Relations in India

### **Course (Paper) Name and No.: Logistics & Supply Chain Management**

- CO1 Learners will be able to understand various technical concepts used in logistics and supply chain management.
- CO2 Learners will be able to understand global trends in logistics and supply chain management.

- CO3 Learners will be able to gain an insight into the nature of supply chain, its functions and supply chain systems.
- CO4 Learners will be able to identify impact of logistical costing on customer satisfaction.
- CO5 Learners will be able to understand various technical concepts used in logistics and supply chain management.

### **Course (Paper) Name and No.: Corporate Communication & Public Relations**

- CO1 The study on Corporate Communication and Public Relation helps the learners to get a brief idea about their work life, how to understand their assignments and deliverables
- CO2 This study helps the learners about how quality work life can be improved.
- CO3 Corporate communication study can help in benefiting and improving the communication between corporate, employees and the public.
- CO4 It gives a brief idea about how effective business communication increases productivity.
- CO5 This study emphasizes on the aspect to work more efficiently, with less human error.

## **Semester VI**

### **Course (Paper) Name and No.: Innovative Financial Services**

- CO1 Help the learners to understand traditional as well as modern financial services based on Fee based and Fund based services
- CO2 Learners will gain knowledge about various intermediaries between the industry and the investors and the process of securitization
- CO3 Help the learners to understand the facility available in the financial market regarding leasing , Hire Purchase, housing finance etc
- CO4 Learners will learn about the financial products available in the market related with consumer Durables and plastic money
- CO5 This course will provide the overall knowledge about Innovative financial services and financial Products available in current market scenario

### **Course (Paper) Name and No.: Project Management**

- CO1 Enable students to apply project management practices to the launch of new programs, products and services
- CO2 To provide overview of planning and controlling activities to effectively produce and deliver goods and services.
- CO3 Enable students to analyze and evaluate appropriate business strategies and practices.
- CO4 To impart knowledge about capital budgeting, capital structure and asset valuation.
- CO5 Develop strategies to initiate plan, execute, monitor and control and close projects in business environment

### **Course (Paper) Name and No.: Strategic Financial Management**

- CO1 Learners will understand the basis of various dividend policy framed by the companies and models used for calculation of dividend
- CO2 Learners will learn the assessment tools to evaluate the projects which will be base for taking Decision to start with or not to start with new projects
- CO3 Help the learners to understand the concept of corporate governance and corporate restructuring like merger, acquisition , takeover etc.
- CO4 Learners will gain the knowledge about short term finance and Banking norms on NPAs
- CO5 This course will provide the overall knowledge about strategic financial management

### **Course (Paper) Name and No.: Indirect Taxes**

- CO1 Learners will learn the definitions covered under GST.
- CO2 Learners will learn levy & collection of GST and composition scheme.
- CO3 Learners will understand supply concept in terms of place, time and value of supply.
- CO4 Learners will learn the documentation and filing of returns.
- CO5 Learners will gain knowledge on GST and application of the same in an organization.

### **Course (Paper) Name and No.: Brand Management**

- CO1 Learners will be able to understand the meaning and significance of brand management.
- CO2 Learners will be able to know how to build, sustain and grow brands.
- CO3 Learners will get idea about various sources of brand equity.
- CO4 Learners will be able to plan and implement various brand management programmes.
- CO5 This course will enable the learners apply what they have learnt theoretically

### **Course (Paper) Name and No.: Retail Management**

- CO1 Learners will gain knowledge of all functional areas of retailing and essential principles of retailing.
- CO2 Learners will get knowledge of essential principles of retailing.
- CO3 Learners will gain insight of the Indian retailing scenario.
- CO4 Learners will develop a sense of legal and ethical aspects of retail management.
- CO5 Learners will be able to understand retail management terminology

### **Course (Paper) Name and No.: International Marketing**

- CO1 Ability to analyze environmental variables that influence international marketing.
- CO2 Ability to research, select and enter a new international market.
- CO3 Develop strategies and tactics that can lead to successful international marketing.
- CO4 More typical management decisions peculiar to problems faced in international arena.
- CO5 Produce a comprehensive international marketing plan.
- CO6 Perform the functional tasks constituting marketing intelligence and mix adaptations

### **Course (Paper) Name and No.: Media Planning & Management**

- CO1 Learners will get an overview of different features, impact and role of media in marketing.

- CO2 Learners will get knowledge of underlying criteria for evaluating the advantages and failure in data sources, media research, media mix and media strategies.
- CO3 Learners will gain insight in different budgeting techniques used, buying processes and tactics, and scheduling of media.
- CO4 Learners will develop a sense of judgment when evaluating media with the help of different media measurement metrics and media buys.
- CO5 Learners will be able to solve marketing problems through understanding how the media operates from the perspective of the advertiser, the agency and the medium itself.

### **Course (Paper) Name and No.: HRM in Global Perspective**

- CO1 Demonstrate an understanding of key terms, theories and practices within the field of IHRM.
- CO2 Familiarize students with the basic concepts and challenges of Expatriates and Repatriates.
- CO3 Learners will be able to have profound understanding of Global Workforce Management.
- CO4 Students will be able to explicate the influence of cross culture on Human Resource Management.
- CO5 An analysis of trends and challenges of IHRM guiding students to arrive at potential remedies of it.

### **Course (Paper) Name and No.: Organisational Development**

- CO1 Learners will be able to understand basics of Organisational development & role of OD practitioner.
- CO2 Learners will understand how human process issues can be used by the OD consultant to diagnose organisation effectiveness.
- CO3 Learners will evaluate the implementation of OD interventions and judge their usefulness against other change tools and techniques;

- CO4 Learners will be able to collect and evaluate data to judge the effectiveness of OD interventions;
- CO5 Learners will formulate an approach for organization development in response to appropriate organizational diagnosis, business imperatives and internal and external contextual forces.

### **Course (Paper) Name and No.: HRM in Service Sector Management**

- CO1 Learners will be able to understand the concept and growing importance of HRM in service sector.
- CO2 Learners will understand the ways of managing human resources in service sector.
- CO3 Learners will be able to understand the significance of human element in creating customer satisfaction through service quality.
- CO4 Learners will gain knowledge about trending issues and challenges of HR in various service sectors.
- CO5 This course will enable the learners apply what they have learnt theoretically

### **Course (Paper) Name and No.: Indian Ethos in Management**

- CO1 Helping learners to imbibe values and practices of Indian Ethos in Management.
- CO2 Learners will be able to establish correlation between Traditional and Modern Management System.
- CO3 Learners will be able to discover a wide spectrum of Stress Management Techniques.
- CO4 Understand and analyse the concept and importance of Learning System in India.
- CO5 Allow students to have an essence of values and its importance in work culture

## **Course (Paper) Name and No.: Operation Research**

- CO1 Understand the meaning, purpose and tools of Operations Research.
- CO2 An ability to identify, formulate and solve complex problems by minimizing cost
- CO3 Learners will identify and express a decision problem and solve it graphically and by Simplex method.
- CO4 To help the learners to recognize and formulate assignment and transportation problems, and how to reach optimal solution
- CO5 Identify parameters that will influence the optimal solution

# Programme- M.Com

## 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

## Course Outcomes

**Class: M. Com. I**

### Semester I

#### **Course (Paper) Name and No.: Business Ethics and Corporate Social Responsibility**

- CO1 Understanding concepts of Business ethics and ethical business practices.
- CO2 Understanding various areas of Corporate Social Responsibility and CSR Policy
- CO3 Learners can understand about Corporate Social Responsibility
- CO4 Learners can understand about Indian Ethical Practices and Corporate Governance

#### **Course (Paper) Name and No.: Strategic Management**

- CO1 Understanding concepts of Strategic Management and their use in business.
- CO2 Understanding strategy formulation, implementation and evaluation.
- CO3 Better knowledge about global strategies and emerging strategic trends.
- CO4 Better knowledge about Business, Corporate and Global Strategies

#### **Course (Paper) Name and No.: Cost and Management Accounting**

- CO1 Learners are able to understand concept of Marginal Cost, Co, BEP and application of Marginal Costing.
- CO2 Learners are able to understand concept of decision making, Managerial decision making, process cost and various types of decisions.
- CO3 Learners are able to understand concept of divisional performance, Responsibility Centres and measures of performance evaluations.
- CO4 Learners are able to understand concept of cost control and cost reduction, standard costing and variance analysis.
- CO5 Learners are able to understand concept of budgetary control, importance of budgetary control and different types of budgets.

## Semester II

### Course (Paper) Name and No.: Research Methodology for Business

- CO1 Understanding basic of Research Methodology.
- CO2 Developing the fundamental skills in formulating research problems.
- CO3 Knowledge of the basic statistical tools and techniques applicable for research.
- CO4 Developing the skill of research reporting.

### Course (Paper) Name and No.: E-Commerce

- CO1 Understand the emerging world of e-commerce and current challenges and issues in e-commerce.
- CO2 Understanding World wide web and E-enterprise and Electronic payment system.
- CO3 Understanding Legal and Regulatory Environment and Security issues of E-commerce
- CO4 Understanding World Wide Web and E-enterprise

### Course (Paper) Name and No.: Corporate Finance

- CO1 Learners are able to develop the objectives of financial management
- CO2 Learners are able to understand to develop and apply the techniques of investment in the financial decision making in the business.
- CO3 Learners are able to understand the concept of time value of money.
- CO4 Learners are able to understand the concept of financial decisions

## **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

# **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

## Course Outcomes

### Class: F.Y.B. Sc. Chemistry Semester I

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

- CO1 Understand different types of systems like open and closed system.
- CO2 Acquire knowledge of different form of heat changes taking place in dissolution and chemical reactions.
- CO3 Learn various ways of defining concentration of a compound in solution.
- CO4 Apply the knowledge acquired for calculating the concentration of a compound in solution.
- CO5 learn Rutherford atomic model and bohr theory with its limitation.
- CO6 Write the IUPAC name of different organic compound.
- CO7 Explain the hybridization of C, N,O in the given organic compound.
- CO8 Classify the different types of organic reactions.

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

- CO1 Derive an expression for rate constant of a first order reaction.
- CO2 Derive an expression for rate constant of second order reaction with equal initial concentration of two reactant.
- CO3 Explain what is mean by main group elements.
- CO4 Learn and explain metallic and non-metallic nature of main group elements.
- CO5 Understands the concept of electronegativity of main group elements
- CO6 Learn about the concept of diagonal relationship between 2<sup>nd</sup> period elements and 3<sup>rd</sup> period elements.
- CO7 Drawing condensed structural formulas, bondline formulas, perspective drawings, Newman projections, Fischer projections.
- CO8 Conformation analysis of alkanes (ethane, propane and n-butane); predicting the relative stability with energy diagrams.

### **Course (Paper) Name and No.: Practical**

- CO1 Perform the standardization of NaOH solution of various concentration.
- CO2 Prepare the solutions of different normality.
- CO3 Determine the percentage purity of BaSO<sub>4</sub> containing NH<sub>4</sub>Cl.
- CO4 Determine the purity of organic compound by recrystallization.
- CO5 Decide the melting point of pure compound.
- CO6 Determine the purity of organic compound by sublimation
- CO7 Perform the experiment of separation of mixture by thin layer chromatography.
- CO8 Separate the liquid mixture by distillation method.

## **Semester II**

### **Course (Paper) Name and No.: Paper I**

- CO1 Learn ideal gas laws, kinetic theory of gases.
- CO2 Apply the acquired knowledge to calculate different parameters concerning a chemical reaction.
- CO3 Learn second law of thermodynamics.
- CO4 Learn thermodynamic derivation of equilibrium constant.
- CO5 understand mechanism of organic reactions like friedel acylation / alkylation.
- CO6 explain calculations of titration curve involving strong acid and strong base.
- CO7 Predict the mechanism of organic reaction.
- CO8 Describe the electrophilic, Nucleophilic and free radical reactions.

### **Course (Paper) Name and No.: Paper II**

- CO1 Difference between amorphous and crystalline solid
- CO2 Define polarizability ( Fajan's rule ) and can understands the shapes of molecules.
- CO3 Understands the applications of redox chemistry like :
  - i) extraction of elements (example : isolation of copper by auto reduction)

ii) redox reagents in volumetric analysis  $I_2$  and  $KMnO_4$

iii) titration curves: i) single electron system ii) multi electron system

- CO4 Recognize and distinguish between aromatic and antiaromatic compounds by their structures.
- CO5 Know the properties of aromatic and antiaromatic compounds, and the chemical consequences of aromaticity.
- CO6 Recognize and be able to write the mechanism of electrophilic aromatic substitution.
- CO7 Students can able to understand the basics of electrophilic aromatic substitution reactions of the following types: halogenation, nitration, sulfonation, and Friedel-Crafts acylation & alkylation.
- CO8 Students can able write the mechanism of electrophilic aromatic substitution reactions of the following types: halogenation, nitration, sulfonation, and Friedel-Crafts acylation & alkylation.

### **Course (Paper) Name and No.: Practical**

- CO1 To determine the rate constant for the separation reaction between ethyl acetate and NaOH.
- CO2 To determine the dissociation constant ( $K_a$ ) of weak acid ( $CH_3COOH$ ) using Hendersons equation  $p_H$  metrically.
- CO3 Verify Beer-Lamberts law using  $KMnO_4$  solution by coloumetric method.
- CO4 Standardize the commercial sample of HCl using borax.
- CO5 Analysis qualitatively cations and anions from a sample.
- CO6 To determine the percentage of copper (IT) present in a given sample by titration.
- CO7 Characterize organic compound containing C,H,(O),N,S,X elements.

## Class: S.Y.B. Sc. Chemistry

### Semester III

#### Course (Paper) Name and No.: General Chemistry - I

- CO1 Understand and apply laws of thermodynamics to chemical systems.
- CO2 Determine feasibility of a chemical reaction from the relation between equilibrium constant and Gibbs free energy.
- CO3 Explain dependence of conductance on parameters such as concentration
- CO4 Apply Kohlrausch's law for the determination of degree of dissociation and dissociation constant of a weak electrolyte conductometrically.
- CO5 Understand concept of transference number of transport number of ions.
- CO6 Understand linear combination of atomic orbitals
- CO7 Explain: Alkyl halides: Nucleophilic substitution reactions :  $SN^1$ ,  $SN^2$ ,  $SN^i$
- CO8 Understand Ring opening reactions, hydrolysis, alcohols, cyanide , ammonia , amines, Grignard reagents and alcoxides

#### Course (Paper) Name and No.: General Chemistry-II

- CO1 Explain effect of temperature on the rate of reaction, Arrhenius equation, concepts of energy activation.
- CO2 Explain theories of reaction rates like collision theory and activated complex theory.
- CO3 Explain Nernst distribution law and its applications
- CO4 Describe electron deficient compounds with respect to Lewis acidity and applications.
- CO5 Explain preparation of simple boranes.
- CO6 Students will understand fundamental concept of keto-enol tautomerism and mechanism of embolization.
- CO7 Concept of active methylene compound, formation of enolate and its application.
- CO8 Study of conversion of active methylene compounds into  $\beta$ -keto ester, ketone, mono and dicarboxylic acids.

### **Course (Paper) Name and No.: Analytical chemistry III**

- CO1 Discuss Report and Describe different methods, errors in analysis
- CO2 Understand Accuracy, Precision and Gravimetric analysis.
- CO3 Discuss different types of Titration with analysis .
- CO4 Understand the formation of standard solutions in analytical chemistry.
- CO5 Perform different types of Titrations
- CO6 Understand basic concepts in Instrumental methods
- CO7 Discuss electromagnetic radiation with basic terms involves
- CO8 Understand Beers-Lamberts law and Instrumentation for absorption spectroscopy

### **Course (Paper) Name and No.: Practical**

- CO1 Students will be able to understand practical aspects of conductometry
- CO2 Students will be able to discuss critical solution temperature (CST) of phenol - Water System.
- CO3 Students will be able to discuss kinetics of the rate determining reaction
- CO4 Students will be able to determine acid and basic radicals
- CO5 Students will be able to understand practical aspect of Preparation, Crystallisation.
- CO6 Students will be able to understand Preparation of different organic reaction

## **Semester IV**

### **Course (Paper) Name and No.: General Chemistry I**

- CO1 Comprehend difference between galvanic cells and electrolysis.
- CO2 Know different forms of electrodes used in electrochemistry.
- CO3 Know the electronic configurations of transition elements;
- CO4 Appreciate the relative stability of various oxidation states in terms of electrode potential values ;
- CO5 Learn the rules of nomenclature of coordination compounds.

- CO6 Describe Mechanism Nucleophilic acyl substitution and acid catalysed nucleophilic acyl substitution
- CO7 Explain Acidity of benzene sulphonic acid
- CO8 Understand reactions with alcohol, Phosphorous pentachloride IPSO substitution

### **Course (Paper) Name and No.: General Chemistry-II**

- CO1 Explain laws of crystallography.
- CO2 Describe the terms involved in Latimer equations.
- CO3 Students will learn the method of nomenclature of aliphatic and aromatic amines.
- CO4 Student will be able to write the resonance structures and predict the site at which electrophilic substitution takes place on the basis of stability of intermediate.
- CO5 Student will be able to write the resonance structures of furan, pyrrole, thiophene and predict the site at which electrophilic substitution takes place on the basis of stability of intermediate.
- CO6 Students will understand the electron distribution based on resonance structures of pyridine and predict the susceptibility of nucleophilic substitution reactions.
- CO7 Students will learn to compare the basicity of pyrrole, pyridine, pyrrolidine and piperidine.
- CO8 Study of sulphonation, reduction and Chichibabin reactions of pyridine.

### **Course (Paper) Name and No.: Analytical chemistry III**

- CO1 Demonstrate various separation methods.
- CO2 Apply the Principle, Technique & Applications of paper and thin layer chromatography
- CO3 Discuss Instrumental techniques like potentiometry, pH-metry etc.
- CO4 Understand and explain the construction, working and different titration curves of Conductometry.
- CO5 Learn Construction, working and care of combined glass electrode

- CO6 Understand and explain Gravimetric analysis, Precipitation, & Argentometric titration with titration curves
- CO7 Interpret and explain Co-precipitation and end points in Volhard method, Mohr's method using adsorption indicator
- CO8 Explain analysis of Soil, water in environmental analysis.

### **Course (Paper) Name and No.: Practical**

- CO1 Students will be able to learn potentiometer, Kinetics of the reaction.
- CO2 Students will be able to learn compare Inorganic preparation – Nickel dimethyl glyoxime using microscale method
- CO3 Students will be able to understand the concept of Complex cation
- CO4 Students will be able to understand practical aspect of Preparation Inorganic salt
- CO5 Students will be able to understand the Organic Chemistry by Qualitative Analysis of bi-functional organic compounds

## Class: T.Y.B. Sc. Chemistry

### Semester V

#### Course (Paper) Name and No.: Physical Chemistry

- CO1 Memorize concept of dipole moment, polar and non- polar molecules.
- CO2 Differentiate Rotational Spectroscopy Vibrational Spectroscopy Raman Spectroscopy.
- CO3 Understand Raoult's law, Clapeyron equation, van't Hoff Factor.
- CO4 Create own model to show osmosis and reverse osmosis
- CO5 Define basic terms of radioactivity i.e. decay constant, half life time, average life and units of radioactivity.
- CO6 Compare G.M. Counter and Scintillation Counter method for detection of radioactivity
- CO7 Apply Carbon Dating method to estimate age of fossils of plants and animals.
- CO8 Apply how the BET equation can be used to determine the surface area of an adsorbent

#### Practical's

- CO1 Handle and Understand principles of different instruments like Potentiometry, Conductometry, pH Metry.
- CO2 Determine molecular weight of substance by using Rast Method
- CO3 With the help of Fractional change method find out order of reaction.

#### Course (Paper) Name and No.: Inorganic Chemistry

- CO1 describe molecular symmetry and concept of point group;
- CO2 Appreciate importance of symmetry in chemistry;
- CO3 Calculate the packing density of different types of cubic unit cells;
- CO4 Describe the imperfections in solids and their effect on properties;
- CO5 Explain consequences of frenkel and schottky defects and differentiate them;
- CO6 Explain the terms superconductivity, transition temperature and meissner effect;
- CO7 Explain different types of super conductors;
- CO8 Give application of superconductors;

## Course (Paper) Name and No.: Organic Chemistry

- CO1 Students will be able to distinguish between stereoselectivity and stereospecificity.
- CO2 Students will learn stereochemistry of substitution reaction, elimination and addition reaction.
- CO3 Writing the mechanism of molecular rearrangements with example and stereochemistry.
- CO4 Writing the structures of carbohydrates in Fischer projection and Haworth formula and its interconversion.
- CO5 Students will be able to solve problems of structure elucidation of simple organic compounds using UV-Visible, IR, NMR and Mass technique. Students will learn to calculate index of hydrogen deficiency in given molecular formula.
- CO6 Explanation and drawing of structures of DNA and RNA including base pairing.
- CO7 Students will understand the functional group transformation and selectivity of reagents like  $\text{LiAlH}_4$ , Red Al,  $\text{NaBH}_4$ ,  $\text{SeO}_2$ , m-CPBA and NBS
- CO8 Students will learn different types of addition & condensation polymers, their preparations and uses.

### Practical's

- CO1 Students will be able to identify chemical type of component present in binary mixture
- CO2 Students will develop basic skill in the separation technique of solid-solid mixture.
- CO3 Students will learn to separate the mixture into components
- CO4 These practicals enable the student to identify unknown organic compound by microscale technique.
- CO5 Students will get training of systematic qualitative analysis of organic compound

## Course (Paper) Name and No.: Analytical Chemistry

- CO1 Students will learn importance of quality concept in industry, different grade chemicals and scientific techniques of sampling
- CO2 Students will understand theoretical aspects of types of chemical titrations

CO3 Student get acquainted with different measurements techniques based on various spectroscopic techniques

CO4 Students will learn modern and sophisticated separation techniques

#### **Practical's**

CO1 Students will able to identify chemical type of component present in binary mixture.

CO2 Students will develop basic skill in the separation technique of solid-liquid and liquid-liquid mixture.

CO3 Students will learn to separate the mixture into components by fractional distillation.

CO4 Competency in handling and performing fractional distillation.

CO5 These practicals enable the student to identify unknown organic compound by microscale technique.

#### **Course (Paper) Name and No.: Drugs**

CO1 Describe the basic scientific concepts and principles that serve as the foundational underpinnings of the pharmacological sciences including pharmacokinetics; pharmacodynamics; drug metabolism; and drug-drug interactions; and explain how these fundamental pharmacological properties can influence route of administration, drug action; drug efficacy and potency; drug levels in the body; potential for drug interactions; drug toxicity; and the appropriate choice of drug for pharmacotherapy in a given patient.

CO2 Explain how to use drug-specific and patient-specific pharmacokinetic parameters to calculate the physiochemical properties that influence rates of drug disposition and clearance in the body, and how these parameters can be used to monitor, design and modify appropriate dosing regimens of drugs in specific patient populations.

CO3 Describe the process by which new drugs are discovered, developed, tested and finally approved by the Federal Drug Administration for use in the clinic.

CO4 List the major drugs and drug classes currently used in medical practice.

CO5 Describe the specific pharmacology of the major drugs and drug classes currently

used in medical practice including their indications, contraindications, clinical use, mechanisms of action, physiological effects, pharmacokinetic properties, major adverse effects and clinically significant drug interactions; and apply this knowledge together with both disease specific and patient-specific factors to select the most appropriate medication(s) for the effective pharmacotherapy of a given disease or condition in a specific patient.

- CO6 Students will be able to describe the term "addiction" and explain various theories of causation.
- CO7 Describe warning sign, symptoms, and the course of substance use disorders.
- CO8 To familiarize the basic classification of drugs

#### **Practical's**

- CO1 Students can able to do the synthesis's of simple drugs i.e aspirin
- CO2 Students can able to perform estimation of Ibuprofen.
- CO3 Students can able to find out acid neutralizing capacity of antacid.
- CO4 Students can able to do the separation of chlorophyll pigment.
- CO5 Students able to do the dyeing of cotton.
- CO6 Students can able to write monogram of any drug.

## Semester VI

### Course (Paper) Name and No.: Physical Chemistry

- CO1 Recall the concept Ionic Strength, activity and activity Coefficient.
- CO2 Differentiate between Concentration cell and chemical cell.
- CO3 Apply Nernst equation for numerical solving
- CO4 Set up an experiment to show decomposition potential and overvoltage
- CO5 Understand Nuclear Spin, Nuclear magnetic moment, Spin angular moment
- CO6 Draw the diagram of NMR Spectrometer.
- CO7 Know the principle of ESR Spectroscopy.
- CO8 Apply principle NMR and ESR for Numerical solving.

#### Practical's

- CO1 Handle and Understand principles of different instruments like Colorimetry, Potentiometry, Conductometry.
- CO2 Determine molecular weight of any high polymer polyvinyl alcohols by viscosity measurement.
- CO3 Interpret the order of reaction graphically from given experimental data and to calculate the specific rate constant.

### Course (Paper) Name and No.: Inorganic Chemistry

- CO1 Explain merits and Limitations of Valence Bond Theory.
- CO2 Explain the shapes of d- orbitals
- CO3 Explain Consequences of crystal field splitting on various properties of metal complexes of the first transition series.
- CO4 Explain Limitations of CFT ;
- CO5 Correlat electronic configurations and lability of complexes.
- CO6 Explain Ligand substitution reactions considering Associative and Dissociative mechanisms.

- CO7 Appreciate rules for determination of ground state term.
- CO8 Determine Terms for  $p^2$  and  $d^1$  electronic configurations

### **Course (Paper) Name and No.: Organic Chemistry**

- CO1 Students will able to distinguish between stereoselectivity and stereospecificity.
- CO2 Students will learn stereochemistry of substitution reaction, elimination and addition reaction.
- CO3 Writing the mechanism of molecular rearrangements with example and stereochemistry.
- CO4 Writing the structures of carbohydrates in Fisher projection and Haworth formula and its interconversion.
- CO5 Students will be able to solve problems of structure elucidation of simple organic compounds using UV-Visible, IR, NMR and Mass technique. Students will learn to calculate index of hydrogen deficiency in given molecular formula.
- CO6 Explanation and drawing of structures of DNA and RNA including base pairing.
- CO7 Students will understand the functional group transformation and selectivity of reagents like  $\text{LiAlH}_4$ , Red Al,  $\text{NaBH}_4$ ,  $\text{SeO}_2$ , m-CPBA and NBS
- CO8 Students will learn different types of addition & condensation polymers, their preparations and uses.

#### **Practical's**

- CO1 Students will able to identify chemical type of component present in binary mixture.
- CO2 Students will develop basic skill in the separation technique of solid-liquid and liquid-liquid mixture.
- CO3 Students will learn to separate the mixture into components by fractional distillation.
- CO4 Competency in handling and performing fractional distillation.
- CO5 These practicals enable the student to identify unknown organic compound by microscale technique.
- CO6 Students will get training of systematic qualitative analysis of organic compound.

## **Course (Paper) Name and No.: Analytical Chemistry**

- CO1 Students will understand basic principles and applications of electroanalytical techniques
- CO2 Students will learn principle of different separation techniques
- CO3 Students will appreciate different aspects of food processing and cosmetics industry and the analysis
- CO4 Students will get familiar with various thermal methods of analysis and various method validation parameters and their importance.

### **Practical's**

- CO1 Students will get hands on practice of various techniques of quantitative estimation.
- CO2 Students will get an opportunity to handle and understand principles of different instruments such as colorimeter, spectrophotometer, pH meter, flame photometer and turbidimeter
- CO3 Students will come across with different types of samples such as cosmetics, polluted water, fertilizer, food, chemicals etc. and their analysis

## **Course (Paper) Name and No.: Drugs**

- CO1 Explain how to use drug-specific and patient-specific pharmacokinetic parameters to calculate the physiochemical properties that influence rates of drug disposition and clearance in the body, and how these parameters can be used to monitor, design and modify appropriate dosing regimens of drugs in specific patient populations.
- CO2 Describe the process by which new drugs are discovered, developed, tested and finally approved by the Federal Drug Administration for use in the clinic.
- CO3 List the major drugs and drug classes currently used in medical practice.
- CO4 Describe the specific pharmacology of the major drugs and drug classes currently used in medical practice including their indications, contraindications, clinical use, mechanisms of action, physiological effects, pharmacokinetic properties, major adverse effects and clinically significant drug interactions; and apply this knowledge

together with both disease specific and patient-specific factors to select the most appropriate medication(s) for the effective pharmacotherapy of a given disease or condition in a specific patient.

- CO5 Recognize the currently accepted diagnostic criteria required to specific diagnose disease and initiate drug therapy and the anticipated therapeutic goals likely to be achieved by therapeutic intervention for the most commonly encountered pathophysiological state(s) and/or disease mechanism(s), as well as any clinical testing requirements for monitoring drug effectiveness and potential toxicity.
- CO6 Students will be able to describe the term "addiction" and explain various theories of causation.
- CO7 Students will be able to Identify and describe different approaches used in the treatment of addictions.
- CO8 Define the routes of administration, methods of ingestion, tolerance, withdrawal and interactions of these drugs with other psychoactive and non-psychoactive drugs.

#### **Practical's**

- CO1 Students can able to do the synthesis's of simple drugs i.e aspirin
- CO2 Students can able to perform estimation of Ibuprofen.
- CO3 Students can able to find out acid neutralizing capacity of antacid.
- CO4 Students can able to do the separation of chlorophyll pigment.
- CO5 Students able to do the dyeing of cotton.
- CO6 Students can able to write monogram of any drug.

# 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

## Course Outcomes

### Class: F.Y.B. Sc. Microbiology

#### Semester I

##### Course (Paper) Name and No.: Fundamentals of Microbiology-I

- CO1 Learners will know the history and scope of Microbiology in industries
- CO2 Learners will understand the microbial diversity
- CO3 Learners will understand the prokaryotic and eukaryotic cytoskeleton and cellular structure in detail at microscopic level
- CO4 Learners will understand the biochemistry of macromolecules present in cell

##### Course (Paper) Name and No.: Basic Techniques in Microbiology

- CO1 Learners will understand the staining techniques routinely used in microbiology
- CO2 Learners will learn how to handle microbial cultures while performing microbiology experiments
- CO3 Learners will learn about nutritional requirements of micro organisms
- CO4 Learners will understand the staining techniques routinely used in microbiology

#### Semester II

##### Course (Paper) Name and No.: Basics of Microbiology II

- CO1 Learners will know about the diversity of micro-organisms.
- CO2 Learners will know significance of microbes in industry and medical sciences
- CO3 Learners understand the growth requirements of microbes
- CO4 Learners will learn to study microbial growth using different analytical techniques

## **Course (Paper) Name and No.: Exploring Microbiology**

- CO1 Learners will know about various microbial associations found around the world
- CO2 Learners can understand the various disease caused by pathogenic microbes
- CO3 Learners can understand the defense system found in human against the pathogens
- CO4 Learners can understand the working principle and methods of handling of microscopic instruments

## **Class: S.Y.B. Sc. Microbiology**

### **Semester III**

#### **Course (Paper) Name and No.: I : Estimation of Biomolecules and Introduction to Bioenergetics and Biostatistics**

- CO1 Learners will understand the estimation of biomolecules
- CO2 Learners will understand the concepts of bioenergetics and thermodynamics
- CO3 Learners will understand the basics of biostatistics
- CO4 Understand the biochemical calculations for the preparation of solutions

#### **Course (Paper) Name and No.: II: Introduction to fermentation technology and Applied Microbiology**

- CO1 Learners will learn about screening techniques and Fermentation media
- CO2 Learners will learn about Fermentor designs and inoculum development
- CO3 Learners will learn importance of microbes in food and food preservation techniques
- CO4 Learners will learn about waste water treatment

#### **Course (Paper) Name and No.: III: Introduction to Microbial Genetics and Molecular Biology**

- CO1 Learners will learn about DNA structure and nucleic acid chemistry
- CO2 Learners will learn about prokaryotic DNA replication.
- CO3 Learners will learn about DNA Mutation and DNA repair mechanisms
- CO4 Learners will learn about **Prokaryotic transcription and translation**

## Semester IV

### Course (Paper) Name and No.: I : Introduction to Metabolism and Enzymology

- CO1 Learners will learn about different types of metabolic pathways
- CO2 Learners will learn about enzyme kinetics
- CO3 Learners will learn about composition and architecture of membrane
- CO4 Learners will learn about solute transport across membrane

### Course (Paper) Name and No.: II : Introduction to Medical Microbiology and immunology

- CO1 Learners will learn about **Common infectious diseases**
- CO2 Learners will learn about **Epidemiology and Public Health Awareness**
- CO3 Learners will learn about **innate immunity and immune system**
- CO4 Learners will learn about **physiological sampling, Diagnostic techniques and Vaccines**

### Course (Paper) Name and No.: III: Advances Analytical Techniques, Soft Skills and Applications of Microbiology

- CO1 Learners will be introduced about bioinformatics, nano biotechnology, biofilm and biosensor
- CO2 Learners will learn about chromatography, spectroscopy and basic centrifugation
- CO3 Learners will learn about research fundamentals, hypothesis writing, study designs,
- CO4 Learners will learn about report writing and presentation

## **Class: T.Y.B. Sc. Microbiology**

### **Semester V**

#### **Course (Paper) Name and No.: I : Microbial Genetics I**

- CO1 Learners will know about the DNA replication process at the molecular level
- CO2 Learners will know about the gene expression mechanism in bacteria
- CO3 Learners will have a better understanding in mutations
- CO4 Learners will understand about exchange of genetic material among the bacteria

#### **Course (Paper) Name and No.: II: Medical Microbiology & Immunology**

- CO1 Learners understand the basic mechanisms acquired by pathogens of respiratory and Urinary tract to cause infection.
- CO2 Learners gain information regarding the prognosis and course of infection of skin and gastrointestinal tract.
- CO3 Learners acquire knowledge of various mechanism adapted by organisms to cause infection
- CO4 Learners understand the functioning of immune system
- CO5 Learners acquire knowledge of diagnostic skills involved in detection of pathogens

#### **Course (Paper) Name and No.: III: Microbial Biochemistry I**

- CO1 Learners will understand the mechanisms to study solute uptake by bacteria
- CO2 Learners will learn Electron transport chain and ATP synthesis process
- CO3 Learners will learn carbohydrate metabolism pathways
- CO4 Learners will learn various fermentation pathways

### **Course (Paper) Name and No.:IV: Bioprocess Technology Part-I**

- CO1 Learners will learn about applications of microbes and its strain improvement in Industrial Microbiology.
- CO2 Learners will learn to determine growth and productivity parameters of batch continuous, fed batch and solid substrate fermentations.
- CO3 Learners will learn to describe the design of bioreactors for different applications and its process parameters.
- CO4 Learners will learn to design media, growth conditions and techniques for producing and recovering different types of products of commercial value.
- CO5 Learners will understand the importance of the containment and levels of containment

## **Semester VI**

### **Course (Paper) Name and No.: Microbial Genetics I**

- CO1 Learners will understand the basics of genetic engineering and molecular biology
- CO2 Learners will understand the use of different tools of genetic engineering in molecular biology experiments
- CO3 Learners will understand how to transform natural cell into transformed cell which can be used at commercial production of proteins
- CO4 Learners will understand the regulatory mechanism found in viruses to control gene expression

### **Course (Paper) Name and No.: II: Medical Microbiology & Immunology**

- CO1 Learners acquire knowledge of mechanism of infection of central nervous system and sexually transmitted diseases.
- CO2 Learners acquire the ability to understand the application and use of antibiotics in treatment of various infections.

- CO3 Learners will understand the mechanism of immune system and formation of immune response.
- CO4 Knowledge of importance and use of vaccines in disease prevention

### **Course (Paper) Name and No.: III: Microbial Biochemistry II**

- CO1 The course will enhance learners understanding about lipid metabolism and will enhance their employability
- CO2 The course will enhance learners understanding about proteins and nucleic acid metabolism and will enhance their employability
- CO3 The course will enhance learners understanding about regulation of metabolism and will develop research aptitude
- CO4 The course will enhance learners understanding about metabolism of inorganic compounds and will enhance their employability

### **Course (Paper) Name and No.:IV: Bioprocess Technology Part II**

- CO1 Understand the actual process involved in fermentations of important products
- CO2 Apply the knowledge of applications of animal and plant tissue culture techniques
- CO3 Learn the applications of immobilized enzymes in various fields
- CO4 Understand the working of important instruments used in biochemical analysis and bioassay.
- CO5 Learn the salient features of quality management, regulatory procedures and IPR
- CO6 Techniques involved in running a bioassay, immobilization of cells & sterility testing
- CO7 Preliminary techniques in animal & plant tissue culture

# 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, nutraceutical 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.

## Course Outcomes

### Class: F.Y.B. Sc. Biotechnology

#### Semester I

##### Course (Paper) Name and No.: Paper I Basic Chemistry

- CO1 The students will be acquainted with the basic concepts of Chemistry like Classification and Nomenclature of Chemical compounds.
- CO2 Students will know about the different types of chemical bonds with their significance.
- CO3 Student will be able to understand the concept of stereochemistry and will be able to solve the problems on it.
- CO4 Students will be able to understand the isomerism which will provide them insight of chemical structures and their geometry.

##### Course (Paper) Name and No.: Paper II Analytical Chemistry

- CO1 Students will use the knowledge regarding chemical calculations and calibrations of glassware and its importance in research.
- CO2 Students will use knowledge of titrimetric and volumetric analysis.
- CO3 Students will learn to handle basic analytical techniques and tools like chromatography and colorimetry.
- CO4 They will learn to solve numerical problems used in preparation of reagents.

##### Course (Paper) Name and No.: Paper III Biodiversity and Ecology

- CO1 Understanding of environmental conservation processes and its importance, pollution control, biodiversity and protection of endangered species by students.
- CO2 The students will acquire the knowledge of microbial and viral cell structure; growth and metabolism understand the microbial diversity, taxonomy and dynamics of microbial interactions with other populations.

- CO3 The student will be able to learn basic concepts of virology.
- CO4 The student is able to define scientific models and questions about the effect of complex biotic and abiotic interactions on all biological systems, from cells and organisms to populations, communities and ecosystems.

### **Course (Paper) Name and No.: Paper IV Basic Microbiology**

- CO1 Students are able to know principle, working, ray diagram application of microscope and advanced microscope. Students will be able to develop skill for visualization of microorganisms with different staining techniques.
- CO2 Students will learn how different types of chemical and physical methods of sterilization can be applied on laboratorial scale as well as industrial scale.
- CO3 Students will understand the growth and reproduction of bacteria. Students will be able to understand the enumeration techniques for microorganisms.
- CO4 Students will understand and perform the basic growth and cultivation techniques of microorganisms.

### **Course (Paper) Name and No.: Paper V Introduction to Biotechnology & Cell Biology**

- CO1 Students will gain knowledge about field of Biotechnology.
- CO2 Students will be able relate the morphological changes that occur in transformed cells.
- CO3 Students will gain the knowledge: how cells conduct, coordinate, and regulate cell division.
- CO4 Students will be familiar with cytological differences between components of prokaryotic and eukaryotic cells

### **Course (Paper) Name and No.: Paper VI Genetics**

- CO1 Students will gain knowledge of the fundamental molecular principles of genetics.
- CO2 They will learn the basic Mendelian laws and terms use in genetics.
- CO2 They will understand the relationship between phenotype and genotype in human genetic traits.
- CO3 Students will gain basics of genetic mapping.

### **Semester II**

#### **Course (Paper) Name and No.: Paper-I (Biochemistry)**

- CO1 Student will acquire the knowledge of chemistry of water and Buffer solutions.
- CO2 Students will have knowledge of structure and functions of biomolecules like carbohydrates, lipids and proteins.
- CO3 Students will have knowledge of structure and functions of amino acids and proteins.
- CO4 Student will acquire the basic knowledge of protein sequencing,

#### **Course (Paper) Name and No.: Paper II (Bioorganic Chemistry –II)**

- CO1 To impart the skill of kinetics and reactions.
- CO2 Understand basic terms used in thermodynamics.
- CO3 Learn first and second law of thermodynamics and its expression in terms of relationship between Heat (q), work (w) and internal energy (U).
- CO4 To impart the knowledge of Principles of oxidation and reduction reactions.

### **Course (Paper) Name and No.: Paper III (Plant and Animal Physiology)**

- CO1 Students will be able to explain how terrestrial vascular plants acquire and use the energy and material resources needed to complete their life cycle, relationships between structure and function, coordination of development, resource acquisition and environmental responses within and across cells, tissues and organs.
- CO2 Students will be acquainted with plant water relationship and basic requirements of nutrients to plants and animals.
- CO3 Using one or more model systems, students will be able to integrate the regulation of organ system functions in a whole animal using a conceptual model of feedback to explain homeostasis.
- CO4 Students will be acquainted with concept of foods and nutrition.

### **Course (Paper) Name and No.: Paper-IV (Molecular Biology)**

- CO1 Students will be acquainted with structure of nucleic acids.
- CO2 Students will be aware how replication takes place inside the cell & Distinguish between DNA template strand and new strand.
- CO3 Students will gain knowledge regarding mutation (genetic variation or change in DNA sequence), predict whether or not that change would result in a change of function for the resulting protein (phenotypic change)
- CO4 Students will be able to understand mechanism of DNA repair.

### **Course (Paper) Name and No.: Paper-V (Tissue Culture and Good Laboratory Practices)**

- CO1 Students will learn basic technical aspects of plant tissue culture technique like media preparation, seed sterilization, callus culture and maintenance of aseptic conditions. The skill could be applied in agriculture and crop improvement.
- CO2 Students will learn to demonstrate foundational knowledge of Cell culture techniques and competence in laboratory technique.

- CO3 Students will understand the highly specific requirements and intent of GLP regulation.
- CO4 Students will understand the importance of documentations such as results reporting, SOPs, Study Plans and Protocol.

**Course (Paper) Name and No.: Paper-VI (Enzymology, Immunology and Biostatistics)**

- CO1 Students will understand the basic concepts of Enzymology.
- CO2 Students will understand the immune system, types of immunity and mechanism.
- CO3 Students will enhance the knowledge of central tendencies.
- CO4 Students will understand the compiling of data using biostatistical tools.

## **Class: S.Y.B. Sc. Biotechnology**

### **Semester III**

#### **Course (Paper) Name and No.: Paper- I (Biophysics)**

- CO1 The students will be able to relate principles of physics to applications & techniques in the field of biology such as spectroscopy, microscopy.
- CO2 Students will be gaining the idea regarding the biological applications of sound, heat and viscosity.
- CO3 Students will be able to learn the analytical techniques for analysis of biomolecules.
- CO4 Students will be able to learn principle and applications of Electrophoresis.

#### **Course (Paper) Name and No.: Paper- II (Applied Chemistry –I)**

- CO1 Students will be able to Distinguish between type of addition, elimination and substitution reaction and understand the mechanism of organic reaction.
- CO2 Students will learn the role of Essential and Non-essential Elements in the biological system.
- CO3 Students will be gaining the knowledge about Synthesis of Organic Compounds and use of Other methods of organic synthesis instead of conventional methods.
- CO4 Students will be able to understand the Principles and applications of green chemistry and green synthesis in Industry.

#### **Course (Paper) Name and No.: Paper-III (Immunology)**

- CO1 Students will be able to understand the role of different types of immune cells.
- CO2 Students will be able to understand the role of effector molecules and effector mechanisms in Immunology.
- CO3 Students will understand the cellular and molecular aspects of lymphocyte activation, homeostasis, differentiation, and memory.
- CO4 Students will be able to understand the principles underlying various immune-techniques.

### **Course (Paper) Name and No.: Paper-IV (Cell Biology and Cytogenetics)**

- CO1 The student will be able to develop an understanding of the Cytoskeleton.
- CO2 Students will get knowledge of Cell compartmentalization and how solutes are transported across membranes. Also students will be able to distinguish between passive and active transport; can explain how substances are directly transported across a membrane and able to describe the primary mechanisms by which cells import and export macromolecules.
- CO3 The student will be able to discuss the structure of Chromosomes and types of Chromosomal Aberrations.
- CO4 Students will have an understanding of the principles underlying Sex Determination, Linkage and Mapping.
- CO5 By understanding of basic concepts in inheritance students will be able to solve simple genetic problems and recognize common misconceptions regarding human heredity

### **Course (Paper) Name and No.: Paper-V (Molecular Biology)**

- CO1 Students will gain the knowledge transcription and translation. Having successfully completed this unit they will be able to explain the mechanism by which transcription is initiated in prokaryotic and eukaryotic cells, the mechanisms by which post-transcriptional control is achieved.
- CO2 Students will be able to discuss the mechanisms associated with Gene Expression at the level of Transcription and Translation. They will be able to make an outline of the mechanisms and factors that control the process of translation Along with an ability to critically evaluate and discuss original research articles in the area of gene regulation.
- CO3 Students will be able to describe the primary post-translational modifications that occur before a protein becomes fully functional.
- CO4 Students will be able to gain the knowledge about tools and techniques in r-DNA technology- DNA manipulative enzymes, Cloning vectors, methods for selection of recombinants and analysis of cloned genes by sequencing methods.

### **Course (Paper) Name and No.: Paper-VI (Bioprocess Technology)**

- CO1 Students will be acquainted with the bioprocess for conversion of raw material to product. Upstream and downstream processing will be discussed it will also explain the processes and techniques used for extraction and purification of a product from culture medium.
- CO2 Students will be gaining the information regarding Bioavailability & Bioequivalence studies.
- CO3 Students will be studying different types of microorganisms for commercial production of products like Penicillin and Ethanol
- CO4 Students will be able to understand principles underlying design of Fermenter and Fermentation Process.

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

- CO1 Students will be able to gain the knowledge about basics of research and the overall research process of designing a research study from its inception to its report.
- CO2 Students will be able to understand how to conduct research work and formulate research synopsis and report.
- CO3 Students will be studying different types of data analytics skills and meaningful interpretation to the data sets so as to solve the Research problem.
- CO4 Students will be able to understand the basic principles of scientific writing.
- CO5 Students will acquire knowledge about the Ethics in Scientific writing and research Publication.

## Semester IV

### Course (Paper) Name and No.: Paper-I (Biochemistry)

- CO1 Students will learn the metabolic pathway, the energy yielding and energy requiring reactions in life.
- CO2 It will help the students to understand the diversity of metabolic regulation and how this is specifically achieved in different cells
- CO3 It will help the students to understand interlinked metabolic reactions with specific control site and key junctions.
- CO4 Students will be able to understand function of specific anabolic and catabolic pathways and how these pathways are controlled and interrelated.

### Course (Paper) Name and No.: Paper-II (Applied Chemistry –II)

- CO1 Students will be able to understand the different methods of separation used in analytical chemistry.
- CO2 Students learn the Classification of natural products and Chromatographic separation of natural products.
- CO3 Students will gain information about the different types of polymers used in applied chemistry.
- CO4 Students will be able to learn about the concept of nanomaterial and applications of nanomaterials.

### Course (Paper) Name and No.: Paper-III (Medical Microbiology)

- CO1 The learner will be able to identify common infectious agents and the diseases that they cause.
- CO2 Learners will be able to understand the factors playing a role in causing a disease gain.
- CO3 Learners will be able to describe the epidemiology of infectious agents including how infectious diseases are transmitted.

- CO4 Learners will be able to discuss the various aspects of systemic infections including causative agents, symptoms and prophylaxis.
- CO5 Learners will be able to gain the technical capability of handling, isolating and identifying various Bacteria.

### **Course (Paper) Name and No.: Paper-IV (Environmental Biotechnology)**

- CO1 Students will understand different types, causes & control measures of different pollutions.
- CO2 Students can get some skills to recognize the ecological problems and critical evaluation of the human impacts on pollution, climate changes and as well as environmental protection.
- CO3 This unit aims to introduce the students to various regional and global concerns regarding the environment, including the natural challenges, various types of environmental pollutants and their effects, the changing environment, and the developments of diverse technologies to detect, study and address these concerns.
- CO4 Students should be able to utilize the knowledge gained on the role and importance of microorganisms in the environment for remediation

### **Course (Paper) Name and No.: Paper-V (Bioinformatics and Biostatistics)**

- CO1 Students will be able to gain an understanding of the basic concept of bioinformatics.
- CO2 Students will be able to understand the tools used in bioinformatics.
- CO3 Students will be able to explain the major steps in pairwise & MSA, explain the principle for & execute pairwise alignment by dynamic programming.
- CO4 Students will be able to define the principal concepts about biostatistics, collect data relating to variable/variables which will be examined and calculate descriptive statistics from these data, identify distribution form relating to the variable/variables and apply hypothesis testing via some of the statistical distributions.

### **Course (Paper) Name and No.: Paper-VI (Molecular Diagnostics)**

- CO1 Students will gain an understanding of the basic Principles used in Molecular Diagnosis.
- CO2 Students will be able to gain critical thinking and analytical skills to understand new Diagnostic Methods.
- CO3 Students will be able to apply the knowledge and skills gained in the course should be useful in developing new Diagnostic Kits.
- CO4 Students can explain the layout of different molecular analysis methods and to understand in depth how the methods work, how these methods are applied in current research and diagnostics, evaluate advantages and disadvantages of the methods and independently select appropriate molecular methods for a given application.

### **Course (Paper) Name and No.: Paper-VII (Entrepreneurship Development)**

- CO1 Students will be able to develop and strengthen the Entrepreneurial quality, i.e. motivation or need for achievement.
- CO2 Students will be able to understand Entrepreneurial discipline and also get encouragement for Self-employment tendencies.
- CO3 Students will be able to create presentations and business plans and also design strategies for successful implementation of ideas.
- CO4 Students will be able to develop their awareness about IPR, Patents, Copyright, Trademarks, Trade secret and Geographical indications.

## **Class: T.Y.B. Sc. Biotechnology**

### **Semester-V**

#### **Course (Paper) Name and No.: Paper-I (Cell Biology)**

- CO1 Students will learn the cell cycle and molecular genetics of cell cycle control.
- CO2 Students will get knowledge of different types of extracellular signals and receptors, and explain their functional significance
- CO3 Students will get knowledge of developmental biology which includes stages, mechanism and patterns of embryonic development.
- CO4 The students will be able to learn how genetics contributes to predisposition and progression of cancer. It will help the students to understand how immunotherapy is, and can be, used to treat human illness.

#### **Course (Paper) Name and No.: Paper-II (Medical Microbiology & Instrumentation)**

- CO1 It will help the students to understand viral replication strategies; and compare and contrast replication mechanisms used by viruses relevant for human disease.
- CO2 Students will learn mechanism of action of chemotherapeutic drugs and resistance.
- CO3 Students will learn basic principle and applications of spectroscopy.
- CO4 They would be able to compare different separation techniques & use them in research work.
- CO5 Students will develop the analytical approach to use advanced instruments required during experimentation

### **Course (Paper) Name and No.: Paper-III (Genomics & Molecular Biology)**

- CO1 Students will learn different techniques of gene transfer in plants to develop transgenic plants.
- CO2 Students will learn different techniques of gene transfer in animals to develop transgenic Animals.
- CO3 Students will be able to Understand the range of molecular laboratory techniques used routinely in human forensic analysis and population genetic analysis including sex typing, DNA profiling, Single Nucleotide Polymorphism (SNP) detection and DNA sequencing.
- CO4 The students will have knowledge of tools like gene sequencing and editing.

### **Course (Paper) Name and No.: Paper-IV (Marine Biotechnology)**

- CO1 Students will learn methodological approaches that are currently being used for microbial bioprospecting, with emphasis in the marine environment.
- CO2 Students will get knowledge of various functional food ingredients and nutraceuticals obtained from marine sources.
- CO3 Students will get knowledge of approved Marine Drugs as Pharmaceuticals and Marine Microbial Enzyme.
- CO4 Students will learn basic technical aspects of marine derived molecules and their applications in industrial process like in pharmaceutical industry and cosmetic industry.

### **Course (Paper) Name and No.: Paper-V (Biosafety-Applied Component)**

- CO1 Students will be acquainted with the biosafety regulation in Biotechnology.
- CO2 Students will be familiar with research in a GLP-complaint manner.
- CO3 Learners will understand how to detect potential contamination risks for product.
- CO4 Students will be able to develop the concepts of biosafety in Biotechnology.

**Class: T.Y.B. Sc. Biotechnology**  
**Semester VI**

**Course (Paper) Name and No.: Paper- I Biochemistry**

- CO1 Students will learn the different levels of protein structure, the relationship between protein structure and function and understand the significance of domains in protein function.
- CO2 Students will learn the significance of structural and storage polysaccharide units and acquire knowledge of various metabolic pathways of carbohydrates.
- CO3 Students will understand basic universal principles of chemical signaling, and the nature of hormonal communication in simple and complex organisms
- CO4 Students will get knowledge of physiological and biochemical functions of minerals and vitamins with malnutrition.

**Course (Paper) Name and No.: Paper-II (Industrial Microbiology)**

- CO1 Students will learn the production outline of various dairy products.
- CO2 Students will learn the different modes of fermentation and Down-stream Processing.
- CO3 Students will learn to develop strategy for fermentation process development
- CO6 Students will understand the Standard operating procedures, GMP and QA and QC.

**Course Name and No.: Paper-III (Pharmacology and Neurochemistry)**

- CO1 Students will learn the mechanism of drug action and its dose–response relationship.
- CO2 Students will learn the mechanisms of drug delivery and action in the body.
- CO3 Students will get in depth knowledge on toxic substances and poisons ie. Toxicology.
- CO4 Students will understand the properties of cells that make up the nervous system including the propagation of electrical signals used for cellular communication.

### **Course (Paper) Name and No.: Paper-IV (Environmental Biotechnology)**

- CO1 Students will learn the concept of solar energy, wind power, geothermal energy and hydropower, biomass energy, Biogas technology and Biofuels.
- CO2 Students will understand the techniques and strategies of Industrial effluent treatment.
- CO3 Students will understand the techniques of waste water management.
- CO4 Students will be Exposed to the processes which are currently associated and taking place in industry along with their consequences arise on generation of hazardous waste.

### **Course (Paper) Name and No.: Paper-V (Agri Biotechnology)**

- CO1 Students will be Exposed to technology and the techniques that can be used to improve the efficiency of agricultural operations like greenhouse technology.
- CO2 Students will develop knowledge in plant physiology and genetics in breeding programmes for plant resistance to abiotic stresses
- CO3 Students will develop knowledge in plant pathogen interactions and genetics in breeding programmes for plant resistance to pest and diseases. They will gain the knowledge of different markers used in plant breeding techniques
- CO4 Students will gain concept of bio-fertilizers, Symbiotic-Non symbiotic nitrogen fixation in leguminous plant, assimilation of phosphorus and biopesticides.

# 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.

## Course Outcomes

### Class: F.Y.B. Sc. Computer Science

#### Semester I

#### Course (Paper) Name and No.: Computer Organization and Design (P I)

- CO1 To learn about how computer systems work and underlying principles
- CO2 To understand the basics of digital electronics needed for computers
- CO3 To understand the basics of instruction set architecture for reduced and complex instruction sets
- CO4 To understand the basics of processor structure and operation
- CO5 To understand how data is transferred between the processor and I/O devices

#### Course (Paper) Name and No.: Programming with Python-I (P-II)

- CO1 Students should be able to understand the concepts of programming before actually starting to write programs.
- CO2 Students should be able to develop logic for Problem solving with conditions, loops and functions
- CO3 Students should be able to apply the problem solving skills using syntactically simple language
- CO4 Students learned about object-oriented features and dictionary concepts.

#### Course (Paper) Name and No.: Programming with C (P –III)

- CO1 Implement programs involving decision structures, loops and functions.
- CO2 Implement pointers, arrays.
- CO3 Implement different data structures and create/update basic data files.

- CO4 Implement all the operators in C programming language.
- CO5 Implement string functions and applications of string functions.

### **Course (Paper) Name and No.: Free and Open Source System (P-IV)**

- CO1 Students will get exposure to a free open source software environment.
- CO2 This course will introduce them to use open source packages so Learners get to know how FOSS technologies work.
- CO3 Learners will be able to choose an appropriate license for open source things in general and to explain what can and cannot be done with software that has a specific license common open source licenses and the impact of choosing a license.
- CO4 This course gives practical knowledge of free and open source technologies which inculcate the ability to contribute to software and interact with Free and Open Source Software development projects.
- CO5 Learners will be able to install and run open-source operating systems.
- CO6 Gives Learners the ability to gather information about Free and Open Source Software projects from software releases and from sites on the internet.
- CO7 Students will Understand the kernel configuration and virtual environment
- CO8 By learning Open Source Ecosystem, it Increases engagement and social entrepreneurship in students

### **Course (Paper) Name and No.: Discrete Mathematics (P-V)**

- CO1 To provide overview of theory of discrete objects, starting with relations and partially ordered sets and study about recurrence relations, generating function and operations on them.
- CO2 Students be able to understand permutations, combinations and counting principles.
- CO3 Give an understanding of graphs and trees which are widely used in software

### **Course (Paper) Name and No.: Descriptive statistics and introduction to probability (P-VI)**

- CO1 Enable learners to know descriptive statistical concepts
- CO2 Enable to study Measures of skewness and Kurtosis and correlation and regression.
- CO3 Enable study of probability concept required for Computer learners
- CO4 Knowledge of various types of data, their organisation and evaluation of summary measures such as measures of central tendency and dispersion etc.

### **Course (Paper) Name and No.: Soft Skill Development (P VII)**

- CO1 To know about various aspects of soft skills and learn ways to develop personality
- CO2 Understand the importance and type of communication in personal and professional environment.
- CO3 To provide insight into much needed technical and non-technical qualities in career planning.
- CO4 Learn about Leadership, team building, decision making and stress management

## **Semester II**

### **Course (Paper) Name and No.: Database System (P-I)**

- CO1 Students learn to evaluate business information problems and find the requirements of a problem in terms of data.
- CO2 Students will learn to design ER-models to represent simple database application scenarios and then convert the ER-model to relational tables, populate relational databases and formulate SQL queries on data.
- CO3 Learners will be able to describe the fundamental elements of relational database management systems.
- CO4 Learners will get the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL.

- CO5 Learners will get to know how to Improve the database design by normalization.
- CO6 Learners will be able to design and build a simple database system with appropriate data-types for storage of data and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

### **Course (Paper) Name and No.: Programming with Python II (P-II)**

- CO1 Students should be able to understand how to read/write to files using python.
- CO2 Students able to catch their own errors that happen during execution of programs.
- CO3 Students should get an introduction to the concept of pattern matching.
- CO4 Students will be familiar with the concepts of GUI controls & designing GUI applications.
- CO5 Students should connect to the database to move the data to/from the application.
- CO6 Students should know how to connect to computers read from URL and send email

### **Course (Paper) Name and No.: Linux (P-III)**

- CO1 Upon completion of this course, learners should have a good working knowledge of Linux, from both a graphical and command line perspective, allowing them to easily use any Linux distribution.
- CO2 This course shall help learner to learn advanced subjects in computer science practically.
- CO3 This course shall help learner to acquire knowledge of networking in Linux
- CO4 Student shall be able to progress as a Developer or Linux System Administrator using the acquired skill set.
- CO5 Students will be able to understand the basic commands of Linux operating system and can write shell scripts

### **Course (Paper) Name and No.: Data Structure (P-IV)**

- CO1 Learn about Data structures, its types and significance in computing.
- CO2 Explore about Abstract Data types and its implementation.
- CO3 Ability to program various applications using different data structure in Python.
- CO4 Learn applications and implementations of stack, queue, heap, tree etc in python.
- CO5 Explore sorting and searching techniques and its implementation.

### **Course (Paper) Name and No.: Statistical Methods & Testing of Hypothesis (P-VI)**

- CO1 Enable learners to know descriptive statistical concepts
- CO2 Enable study of probability concept required for Computer learners
- CO3 Enable to study the concept of hypothesis testing.
- CO4 An idea of conducting the sample surveys and selecting appropriate sampling techniques

### **Course (Paper) Name and No.: Green Technology (P-VII)**

- CO1 Students should be able to understand the concept of green technology concept.
- CO2 Students should be able to understand green server, green data centre, green server farm.
- CO3 Aware good and dangerous activity to environment.
- CO4 Understand the strategies, frameworks, processes and management of green IT

## **Class: S.Y.B. Sc. Computer Science**

### **Semester III**

#### **Course (Paper) Name and No.: Theory of Computation (P-I)**

- CO1 Understand Automata theory and Languages
- CO2 Understand and design Grammar and its application in Language design
- CO3 Design and implement Turing Machines and Pushdown Automata
- CO4 Design and implement Linear Bounded Automata and its applications
- CO5 Solve various problems of applying normal form techniques

#### **Course (Paper) Name and No.: Core Java (P-II)**

- CO1 Object oriented programming concepts using Java
- CO2 Knowledge of input, its processing and getting suitable output
- CO3 Understand, design, implement and evaluate classes and applets
- CO4 Knowledge and implementation of AWT package

#### **Course (Paper) Name and No.: Operating System (P-III)**

- CO1 To provide a understanding of operating system, its structures and functioning
- CO2 Develop and master understanding of algorithms used by operating systems for various purposes.
- CO3 Describe and analyse the memory management and its allocation policies.
- CO4 To provide a sound understanding of Computer operating system, its structures, functioning and algorithms.

#### **Course (Paper) Name and No.: Database Management System (P-IV)**

- CO1 Master concepts of stored procedure and triggers and its use.
- CO2 Learn about using PL/SQL for data management.

- CO3 Understand concepts and implementations of transaction management and crash recovery
- CO4 Execute various advanced SQL queries related to Transaction Processing & Locking using concept of Concurrency control.

### **Course (Paper) Name and No.: Combinatorics and Graph Theory (P-V)**

- CO1 Appreciate the beauty of combinatorics and how combinatorial problems naturally arise in many settings.
- CO2 Understanding the combinatorial features in real world situations and Computer Science applications.
- CO3 Apply combinatorial and graph theoretical concepts to understand computer science concepts and apply them to solve problems.
- CO4 Learners will be able to analyze combinatorial objects satisfying certain properties and answer questions related to existence (proving the existence or non-existence of such objects), construction (describing how to create such objects in the case they exist), enumeration (computing the number of such objects), and optimization (determining which objects satisfy a certain extremal property).

### **Course (Paper) Name and No.: Physical Computing and IOT Programming (P VI)**

- CO1 Enable learners to understand System On Chip Architectures
- CO2 Introduction and preparing Raspberry Pi with hardware and installation
- CO3 Learn physical interfaces and electronics of Raspberry Pi and program them using practical's
- CO4 Learn how to make consumer grade IoT safe and secure with proper use of protocols

### **Course (Paper) Name and No.: Web Programming (P-VII)**

- CO1 To design valid, well-formed, scalable, and meaningful pages using emerging technologies
- CO2 Understand the various platforms, devices, display resolutions, viewports, and browsers that render websites
- CO3 To develop and implement client-side and server-side scripting language programs.
- CO4 To develop and implement Database Driven Websites.
- CO5 Design and apply XML to create a mark-up language for data and document centric applications

## **Semester IV**

### **Course (Paper) Name and No.: Fundamentals of Algorithm (P-I)**

- CO1 Understand the concepts, different algorithm techniques and its approaches.
- CO2 Improve logical skills by implementing algorithms
- CO3 Build a strong foundation on fundamentals and exposure to advanced techniques.
- CO4 Build research skills and improve project based learning.

### **Course (Paper) Name and No.: Advanced Java (P-II)**

- CO1 Understand the concepts related to Java Technology
- CO2 Explore the use of Java Server Programming
- CO3 Understand the fundamentals of JSON
- CO4 Explore the use of Struts and Java Bean

### **Course (Paper) Name and No.: Computer Network (P III)**

- CO1 Learner will be able to understand the concepts of networking, which are important for them to be known as a '*networking professionals*'

- CO2 Useful to proceed with industrial requirements and International vendor certifications
- CO3 Learners will be able to understand the services provided by each layer of network models
- CO4 Learner will acquire knowledge that will help them in Advanced courses and certifications in computer networking

### **Course (Paper) Name and No.: Software Engineering, Paper IV**

- CO1 Understand the concepts of process model, metrics and how to apply in organization
- CO2 Implement the techniques like project scheduling, risk management in organization.
- CO3 Draw useful diagrams associated with the system.
- CO4 Development of Software with help of SDLC phases

### **Course (Paper) Name and No.: Linear Algebra using Python (PV)**

- CO1 Appreciate the relevance of linear algebra in the field of computer science.
- CO2 Understand the concepts through program implementation.
- CO3 Install computational thinking while learning linear algebra.
- CO4 Solve systems of linear equations using multiple methods, including Gaussian elimination and matrix inversion.

### **Course (Paper) Name and No.: .NET Technologies (P-VI)**

- 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.: Android (PVII)**

- CO1 At the end of the course student will able to understand the requirements of Mobile programming environment.
- CO2 At the end of the course student Learn about basic methods, tools and techniques for developing Apps
- CO3 Explore and practice App development on Android Platform
- CO4 Develop working prototypes of working systems for various uses in daily lives.

## **Class: T.Y.B. Sc. Computer Science**

### **Semester V**

#### **Course (Paper) Name and No.: Artificial Intelligence (Elective-I-P-I)**

- CO1 Understanding the various search techniques, constraint satisfaction problem, game playing techniques
- CO2 Acquire knowledge of real world knowledge representation.
- CO3 Analyse and design real world problems for implementation and understanding the dynamic behaviour of the system.
- CO4 Apply the basic principles, models, and algorithms of Artificial Intelligence to recognize, model, and solve problems in the analysis and design of information systems.

#### **Course (Paper) Name and No.: ST&QA (Elective-I-P-II)**

- CO1 Learners will understand software testing and quality assurance as a fundamental component of software life cycle
- CO2 The students will understand the process of applying tests to software and the fundamental components of a test case.
- CO3 Understand various software testing methods and strategies.
- CO4 Understand a variety of software metrics, and identify defects and manage those defects for improvement in quality for given software.
- CO5 Design SQA activities, SQA strategy, formal technical review report for software quality control and assurance.
- CO6 The students will understand the process of applying tests to software and the fundamental components of a test case.

### **Course (Paper) Name and No.: PIII Information & Network Security (Elective-II-P-I)**

- 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 practicals.

### **Course (Paper) Name and No.: Web Service (Elective-II-P-III)**

- CO1 Design SOAP based web services that associated with standards such as WSDL and UDDI
- CO2 Design Restful Web Services with JAX-WS and JAX-RS
- CO3 Design WCF services and deal with QoS issues of Web Services
- CO4 Design and Implement secure Web Services

### **Course (Paper) Name and No.: Game Programming (P-V)**

- CO1 Study Graphics and gaming concepts with present working style of developers where everything remains on internet
- CO2 Study and review Unity community
- CO3 Understand and be a part of Unity community
- CO4 Design small games using logical skill

## Semester VI

### Course (Paper) Name and No.: Cloud Computing (Elective-I P-I)

- CO1 Learners get exposed to areas of Cloud Computing, and encouragement for further study and research.
- CO2 Students learn to articulate the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing using open source technology.
- CO3 Students get the ability to identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.
- CO4 Students learn to identify the core issues of cloud computing such as security, privacy, and interoperability

### Course (Paper) Name and No.: Cyber Forensics (Elective-I P-III)

- CO1 The student will be able to plan and prepare for all stages of an investigation - detection, initial response and management interaction.
- CO2 Investigate various media to collect evidence.
- CO3 Learn investigation of network and host system intrusions, analysis and documentation of information gathered.
- CO4 Report various investigations in a way that would be acceptable in the court of law.

### Course (Paper) Name and No.: Information Retrieval (Elective-II-P-I)

- CO1 Learners Should be able to understand the field of Information retrieval
- CO2 Learners should be able to design information retrieval model
- CO3 It will give the learner an understanding to apply information retrieval model
- CO4 After completion of this course, learners should get an understanding of the field of information retrieval and its relationship to search engines.

### **Course (Paper) Name and No.: Data Science (Elective-II-P-III)**

- CO1 After completion of this course, the learners should be able to understand & comprehend the problem.
- CO2 Learners should be able to define suitable statistical methods to be adopted.
- CO3 Learner should be able to understand data management, data curation techniques
- CO4 Learners will demonstrate proficiency with statistical analysis of data and will develop the ability to build and assess data based models.

### **Course (Paper) Name and No.: Ethical Hacking (P-V)**

- CO1 To identify security vulnerabilities and weaknesses in the target applications
- CO2 Learn to test and exploit systems using various tools
- CO3 Understand the impact of hacking in real time machines
- CO4 Learn to protect from malwares such as viruses, worms

# 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.

## Course Outcomes

### Class: F.Y.B. Sc. Information Technology

#### Semester I

##### Course (Paper) Name and No.: Introduction to C++ Programming (P-I)

- CO1 Learners will be able to understand the Basic concepts of C++ programming.
- CO2 Learners will be able to understand concept of Loops and manipulators.
- CO3 Learners will be able to learn the use of functions in C++ program.
- CO4 Learners will be able to understand various Data types.
- CO5 Learners will be able to gain expertise over concepts of string, vectors and structures.

##### Course (Paper) Name and No.: Digital Electronics (P-II)

- CO1 Learners will be able to understand number representation and conversion between different representations in digital electronic circuits.
- CO2 Learners will be able to analyze logic processes and implement logical operations using combinational logic circuits.
- CO3 Learners will be able to understand concepts of sequential circuits and to analyse sequential systems in terms of state machines.
- CO4 Learners will be able to design and analyze of electronic circuits using multiplexers, de-multiplexers, encoders, decoders and flip- flops.
- CO5 Learners will be able to understand the functioning of counters and shift registers with respect to its application in electronic display and sequence generator.

### **Course (Paper) Name and No.: Operating Systems (P-III)**

- CO1 Learners will be able to describe the importance of computer system, Process management policies and scheduling of processes by CPU.
- CO2 Learners will be able to describe and analyses the memory management and its allocation policies.
- CO3 Learners will be able to understand the File systems, its structure and operations.
- CO4 Learners will be able to evaluate the requirement for process synchronization and coordination handled by operating system.
- CO5 Learners will be able to identify the need to create the special purpose operating system.

### **Course (Paper) Name and No.: Discrete Mathematics (P-IV)**

- CO1 Learners will be able to learn the discrete theory, logic form, its equivalence, quantified statements.
- CO2 Learners will be able to solve the recurrence relations, generating function and operation on them.
- CO3 Learners will be able to solve the probability problems, combination and permutations as well as the mathematical induction.
- CO4 Learners will be able to learn the properties of graphs, tree, isomorphism of trees and finding the shortest path.
- CO5 Learners will be able to learn the direct proofs, divisibility, quotient-remainder theorem, contraposition and contradiction.

### **Course (Paper) Name and No.: Communication Skills (P-V)**

- CO1 Learners will be able to understand the basics of Business communication.
- CO2 Learners will be able to learn to write business messages appropriately.
- CO3 Learners will be able to learn how to talk in meetings or group discussion i.e. orally.

- CO4 Learners will be able to learn how to communicate in different fields or departments.
- CO5 Learners will be able to learn to make presentations and how to present one.

## **Semester II**

### **Course (Paper) Name and No.: Object oriented Programming (P-I)**

- CO1 Learners will be able to learn advanced features of C++ programming language as a continuation of the previous course, to learn the characteristics of an object oriented programming language.
- CO2 Learners will be able to use classes, constructors and destructors.
- CO3 Learners will be able to learn to use Polymorphism virtual, function.
- CO4 Learners will be able to learn to use program development using inheritance, exception handling.
- CO5 Learners will be able to working with template and files.

### **Course (Paper) Name and No.: Microprocessor Architecture (P-II)**

- CO1 Learners will be able to understand basics about Microprocessor.
- CO2 Learners will be able to learn concepts of microprocessor architecture, interface devices and Assembly Language.
- CO3 Learners will be able to learn additional programming techniques.
- CO4 Learners will be able to understand concepts of Stacks and subroutines and BCD arithmetic.
- CO5 Learners will be able to learn about Software development system.

### **Course (Paper) Name and No.: Database Management System (P-III)**

- CO1 Learners will be able to design the database schema with the use of appropriate data types for Storage of data in database.
- CO2 Learners will be able to design relational databases.

- CO3 Learners will be able to create, manipulate, query and back up the databases.
- CO4 Learners will be able to Manage the transaction of databases.
- CO5 Learners will be able to perform the Basic SQL Programming.

### **Course (Paper) Name and No.: Numerical Methods (P-IV)**

- CO1 Learners will be able to solve the equations using bisection, newton raphson method and iterative methods.
- CO2 Learners will be able to learn newton's forward difference and newton' backward difference interpolation, lagrange and spline interpolation.
- CO3 Learners will be able to solve derivatives using the newton forward and backward difference interpolation.
- CO4 Learners will be able to solve the integrations using various numerical methods and solving the double integrals.
- CO5 Learners will be able to find the characteristics value using the power method and solutions to the equations using direct methods

### **Course (Paper) Name and No.: Web Programming (P-V)**

- CO1 Learners will be able to develop simple web pages and apply formatting to it.
- CO2 Learners will be able to design forms and incorporate audio and video on web pages.
- CO3 Learners will be able to handle user events through client side scripting.
- CO4 Learners will be able to develop dynamic web pages using server side scripting.
- CO5 Learners will be able to provide interaction between web pages and databases using server side scripting.

## **Class: S.Y.B. Sc. Information Technology**

### **Semester III**

#### **Course (Paper) Name and No.: Python Programming (P-I)**

- CO1 Learners will be able to understand basic features like Variables, Operators, Math functions, various Decision Making statements.
- CO2 Learners will be able to understand different Functions & Strings
- CO1 Learners will be able to understand and summarize Lists, Tuples, Dictionaries, Different File Handling& Error Handling operations.
- CO2 Learners will be able to understand Interpret Object Oriented Programming in Python.
- CO 5 Learners will be able to design GUI Application in Python & evaluate Database operations.

#### **Course (Paper) Name and No.: Data Structures (P-II)**

- CO1 Learners will be able to understand the basics of algorithm analysis.
- CO2 Learners will able to describe operations on linked list.
- CO3 Learners will be able to understand analysis of stack and queue operations.
- CO4 Learners will be able to understand different searching and sorting techniques tree and AVL tree structures.
- CO5 Learners will be able to analyze graphs and hashing techniques

#### **Course (Paper) Name and No.: Computer Networks (P-III)**

- CO1 Learners will get Knowledge about computer networking basics
- CO2 Learners will be able to understand different data transmission mediums.
- CO3 Learners will be able to understand different types of wired and wireless networking technologies.
- CO4 Learners will be able to understand Functionality of the Network layer.
- CO5 Learners will be able to understand various Transport layer protocols.

### **Course (Paper) Name and No.: Advanced SQL (P-IV)**

- CO1 Learners will be able to design the database with SQL.
- CO2 Learners will be able to work with various databases objects.
- CO3 Learners will be able to perform basic PL/SQL Programming.
- CO4 Learners will be able to develop efficient PL/SQL programs to access Oracle databases using Control structures, Exception handling, composite data type, Cursors.
- CO5 Learners will be able to perform the advanced PL/SQL Programming.

### **Course (Paper) Name and No.: Applied Mathematics (P-V)**

- CO1 Learners will be able to gain expertise in solving matrices using different methods and polar, exponential form of complex as well as hyperbolic functions.
- CO2 Learners will be able to solve the differential equation using various methods and differential equations with constant coefficients.
- CO3 Understand the properties and theorems of laplace and integrate the laplace transform and find the inverse laplace using differential equations.
- CO4 Learners will be able to find double and triple integrals in polar coordinates and area, volume using double and triple integrals.
- CO5 Learners will be able to understand the properties of beta, gamma functions and solve the error functions.

## **Semester IV**

### **Course (Paper) Name and No.: Core Java (P-I)**

- CO1 Learner will be introduced with the basic concepts and terminologies of java programming
- CO2 Learner will be able to develop java code using control structures, iteration
- CO3 Learner will use the advance class features including inheritance, polymorphism and overloading, overriding, interfaces, abstract classes and develop efficient and reusable codes

- CO4 Learners will be made familiar with multithreading, IO File handling and exception handling techniques.
- CO5 Learner will be able to design, develop and execute AWT application

### **Course (Paper) Name and No.: Introduction to Embedded System (P-II)**

- CO1 Learners will become familiar with classification, characteristics, core components of embedded system
- CO2 Learners will become familiar with memory, types of memory, registers
- CO3 Learners will acquire skills in 8051 programming in C
- CO4 Learners will acquire skills for selecting microcontroller and developing basic applications.
- CO5 Learners will be familiar with different types of operating system and its characteristics.

### **Course (Paper) Name and No.: Computer Oriented Statistical Techniques (P III)**

- CO1 Learner will be able to calculate and apply measures of dispersion.
- CO2 Learner will be able to apply discrete and continuous probability distribution to various problems.
- CO3 Learner will be able to test the hypothesis as well as calculate confidence interval and the p-concept.
- CO4 Learner will be able to learn non-parametric test such as the Chi-square test for independence as well as goodness of fit.
- CO5 Learner will be able to compute and interpret the results of bivariate and multivariate regression and correlation analysis and to perform ANOVA.

### **Course (Paper) Name and No.: Software Engineering (P-IV)**

- CO1 Learners will be able to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment
- CO2 Learners will have an ability to work in one or more significant application domains
- CO3 Learners will be able to work as an individual and as part of a multidisciplinary team to develop and deliver quality software
- CO4 Learners will be able to understand and apply current theories, models, and techniques that provide a basis for the software lifecycle
- CO5 Learners will be able to use the techniques and tools necessary for engineering practice

### **Course (Paper) Name and No.: Computer Graphics and Animation (PV)**

- CO1 Learners will be able to understand computer graphics.
- CO2 Learners will be able to do 2D & 3D transformations.
- CO3 Learners will be able to create 3D objects using lines and color.
- CO4 Learners will be able to create different objects with different planes, curves.
- CO5 Learners will be able to do animation through programming.

## **Class: T.Y.B. Sc. Information Technology**

### **Semester V**

#### **Course (Paper) Name and No.: Software Project Management (P-I)**

- CO1 Learners will be able to clear the idea about project planning.
- CO2 Learners will be able to determine Success criteria for a project.
- CO3 Learners will be able to reduce some risk certain of appropriate prototype
- CO4 Learners will be able to determine, estimate the overall duration of project.
- CO5 Learners will be able to Identify the resource requirements.

#### **Course (Paper) Name and No.: Internet of Things (P-II)**

- CO1 Learners will be able to Interpret the vision of IoT from a global context
- CO2 Learners will be able to become familiar with IoT hardware components
- CO3 Learners will be able to acquire skills to design 3D modules
- CO4 Learners will be able to determine the Market perspective of IoT
- CO5 Learners will be able to acquire skills on developing their enterprise level technical strategies

#### **Course (Paper) Name and No.: Advanced Web Programming (P-III)**

- CO1 Learners will be able to do programming with C# Language.
- CO2 Learners will be able to acquire skills to design web page incorporate with different server controls on web pages.
- CO3 Learners will be able to acquire skills to handle Error Handling, Logging, and Tracing , State Management
- CO4 Learners will be able to acquire skills to develop dynamic web pages using ADO.NET Fundamentals
- CO5 Learners will be able to provide interaction between web pages using ASP.NET AJAX.

### **Course (Paper) Name and No.: Linux System Administration (P-IV)**

- CO1 Learners will be able to acquire skills to manage system level processes and handle software management on linux platforms.
- CO2 Learners will be able to handle user accounts and manage storage space on systems.
- CO3 Learners will be able to configure firewall and provide security to data on linux machines through cryptography
- CO4 Learners will be able to acquire skills to configure different types of servers.
- CO5 Learners will be able to do shell level programming in Linux

### **Course (Paper) Name and No.: Enterprise Java (P-V)**

- CO1 Learners will be able to create servlet and develop java applications with database connectivity.
- CO2 Learners will study the fundamentals and core concepts of cookies, session, file uploading, file downloading and request dispatcher
- CO3 Learners will gain knowledge and experience required to develop and deploy JSP application using JSTL.
- CO4 Learners will be able to develop and deploy EJB application with concepts of Interceptors, JNDI.
- CO5 Learners will be familiar with the development of application using concept of Persistence, Object/Relational Mapping, JPA and Hibernate.

## **Semester VI**

### **Course (Paper) Name and No.: Software Quality Assurance (P-I)**

- CO1 Learners will be able to analyse the quality of software product
- CO2 Learners will be able to understand different testing methodology
- CO3 Learners will be able to analyse the difference between black box and white box testing

- CO4 Learners will be able to understand verification and validation techniques
- CO5 Learners will be able to understand special types of testing and levels of testing

### **Course (Paper) Name and No.: Security in Computing (P-II)**

- CO1 Learners will be able to introduce to basics of information security with risk analysis and design
- CO2 Learners will be able to identify some of the factors driving the need for Database and storage security
- CO3 Learners will be able to identify some of the factors driving the need for Network security
- CO4 Learners will be able to gather information about multiple attacks, vulnerabilities and how to detect & prevent them.
- CO5 Learners will be aware of information about cloud storage, virtualization and how to secure them

### **Course (Paper) Name and No.: Business Intelligence (P-III)**

- CO1 Learners will be able to Identify the major frameworks of computerized decision support: decision support systems (DSS), data analytics and business intelligence.
- CO2 Learners will be able to analyze data, choose relevant models and algorithms for respective applications
- CO3 Learners will be able to become familiar with classification methods, clustering methods.
- CO4 Learners will be able to design application using Business Intelligence techniques.
- CO5 Learners will be able to ability to design and develop the AI applications in real world scenario

## **Course (Paper) Name and No.: Principles of Geographic Information Systems (P-IV)**

- CO1 Learners will be able to get introduction about basic GIS data types and technologies
- CO2 Learners will be able to get knowledge about various GIS data management and processing techniques.
- CO3 Learners will be able to Learn Spatial data processing techniques and positioning.
- CO4 Learners will be able to learn various functions in GIS.
- CO5 Learners will be able to create various maps in GIS

## **Course (Paper) Name and No.: IT Service Management (P-V)**

- CO1 Learners will be able to gain understanding of scope, purpose, and objective of Service Management.
- CO2 Learners will be able to understand Service Design, Service Design Principles and its Strategies.
- CO3 Learners will be able to understand implementation of services through Service Transition Phase.
- CO4 Learners will be able to understand Service Operation Phase and activities for operating services.
- CO5 Learners will be able to understand Process of Continual Service Improvement and its challenges delivering the service.

## **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.

## Course Outcomes

### Class: F.Y.B. Sc. Zoology

#### Semester I

#### **Course (Paper) Name - Kingdom Animalia, Wonders of Animal World, Biodiversity and its Conservation**

- CO1 Curiosity will be ignited in the mind of learners, to know more about the fascinating world of animals which would enhance their interest and love for the subject of Zoology.
- CO2 The Learner would come to know about basic of systematic and the hierarchy in invertebrates.
- CO3 Learners would appreciate the treasure of Biodiversity, its importance and hence would contribute their best for its conservation
- CO4 Learners would be able to evaluate the significance of museum specimens
- CO5 Learners would be able to understand the historical development of systematic biology from the 18th century to the present and gain a basic grasp on the rules and philosophy of nomenclature.
- CO6 A Learner would have knowledge about different phyla with their respective examples.

#### **Course (Paper) Name- Laboratory safety units and measurement, Instrumentation and Animal biotechnology**

- CO1 Learners would work safely in the laboratory and avoid the occurrence of accidents (mishaps) which will boost their scholastic performance and understanding of economy in the use of materials/chemicals during practical sessions.

- CO2 The learner would be able to select and operate suitable instruments for the studies of different components of Zoology. Further learner would be skilled in the area of research.
- CO3 The learner would understand the recent advances in the subject, its applications for the betterment of mankind; and that the young minds would be tuned to think out of the box
- CO4 Learners would develop skills in science courses with the understanding of good laboratory practices
- CO5 Learner would be able to apply various techniques to study animal tissues. Learners would be able to explore various research issues and their solutions.
- CO6 Learners would be able to understand the different Graphs and Functions of Basic Mathematics and able to recognize simple functions of basic Mathematics.

## **Semester II**

### **Course (Paper) Name and No.: Kingdom Animalia Part-II, Ecosystem, National Park and Sanctuaries**

- CO1 This course explores the classification system used to identify animals. This unit is specifically designed to move quickly beyond the knowledge level of high-level thinking.
- CO2 Learners would comprehend the basic concepts of animal taxonomy and zoological nomenclature.
- CO3 Learners will grasp the concept of interdependence and interaction of physical, chemical and biological factors in the environment and will lead

to better understanding about implications of loss of fauna specifically on human beings.

- CO4 Learners would understand the fundamental issues of environment and analyze different sources of environmental problems.
- CO5 Learners would be inspired to choose career options in the field of wildlife conservation, research, photography and ecotourism.
- CO6 Learners would develop an understanding for the environment which is largely degraded in the current scenario and understand the importance of biodiversity and the consequences of biodiversity loss.

**Course (Paper) Name: Nutrition and Health, Common Human Parasites, Common Human diseases and disorders**

- CO1 Healthy dietary habits would be inculcated in the life style of learners in order to prevent the risk of developing health hazards in younger generation due to faulty eating habits.
- CO2 Learner would develop the proper and scientific value of different food items and know the caloric value of the food items
- CO3 Learners would be able to promptly recognize stress related problems at initial stages and would be able to adopt relevant solutions which would lead to psychologically strong mind set promoting a positive attitude important for academics and would be able to acquire knowledge of causes, symptoms and precautions of infectious diseases
- CO4 Learners would be able to understand the importance of good health. Learners would be able to observe clean sexual habits thereby warding off sexually transmitted diseases.

- CO5 Learners would develop awareness about the causative agents and control measures of many commonly occurring diseases and develop understanding about the favorable breeding conditions for the vectors.
- CO6 Learners would undertake measures or start awareness programs for maintenance of hygienic conditions, avoidance of contact from vector, destruction of breeding spots in the vicinity of houses and cattle shed by public health education campaign.

**Class: S.Y.B. Sc. Zoology**

**Semester III**

**Course (Paper) Name and No.: Fundamentals of Genetics, Chromosomes and Heredity, Nucleic acids**

- CO1 Learner shall comprehend and apply the principles of inheritance to study heredity and know the concept of multiple alleles, linkage and crossing over
- CO2 Learner will comprehend the structure of chromosomes and its types and understand the mechanisms of sex determination
- CO3 The learner will understand the importance of nucleic acids as genetic material.
- CO4 Learners would know the cause and effect of alterations in chromosome number and structure.
- CO5 Learners would be able to relate the conventional and molecular methods for gene manipulation in other biological systems.
- CO6 Learners would comprehend the process of DNA replication, transcription and translation.

**Course (Paper) Name and No.: Study of Nutrition and Excretion, Respiration and circulation, Control and coordination, Locomotion and Reproduction**

- CO1 Learner would understand the increasing complexity of nutritional, excretory and osmoregulatory physiology in evolutionary hierarchy.
- CO2 Learner would be able to understand the mechanism and regulation of breathing, oxygen consumption and determination of respiratory quotient.

- CO3 Learner would be able to know about the organization of the nervous system and process of nerve conduction.
- CO4 Learner would apprehend the process of control and coordination by nervous and endocrine regulation.
- CO5 Learner would be fascinated by various locomotory structures found in the animal kingdom.
- CO6 Learner would be acquainted with various reproductive strategies present in animals.

**Course (Paper) Name: Developmental Biology, Ethology, Parasitology,**

- CO1 Learner will be able to understand and compare the different pre-embryonic stages
- CO2 Learner will be able to appreciate the functional aspects of extra embryonic membranes and classify the different types of placentae.
- CO3 Learners would gain an insight into different types of animal behavior and their role in biological adaptations.
- CO4 Learners would be sensitized to the feelings instrumental in social behavior.
- CO5 Learners would understand the general epidemiological aspects of parasites that affect humans and apply simple preventive measures for the same.
- CO6 Learners would comprehend the life cycle of specific parasites, the symptoms of the disease and its treatment
- CO7 Learners would gain knowledge on animals useful to mankind and the means to make the most of it.

## Semester IV

### **Course (Paper) Name: Origin and Evolution of Life, Population and Evolutionary Genetics, Scientific Attitude, Methodology, Scientific Writing and Ethics in Scientific Research**

- CO1 Learner will gain insight about origin of life. Learner will ponder and critically view the different theories of evolution.
- CO2 Learner would understand the forces that cause evolutionary changes in natural populations.
- CO3 Learner would comprehend the mechanisms of speciation.
- CO4 Learner will be able to distinguish between microevolution, macroevolution and megaevolution.
- CO5 Learners would understand the concept of research and different types of research in the context of biology
- CO6 The learner shall develop qualities such as critical thinking and analysis.
- CO7 The learner will imbibe the skills of scientific communication
- CO8 Learners will understand the ethical aspects of research.

### **Course (Paper) Name: Cell biology, endomembrane system and biomolecule**

- CO1 Learner would acquire insight of transport mechanisms for the maintenance and composition of cell.
- CO2 Learner would appreciate the intricacy of endomembrane system.
- CO3 Learner would understand the interlinking of endomembrane system for functioning of cell.
- CO4 The learner will learn the about the basic structure of biomolecules.
- CO5 Learners can learn to classify the biomolecules.

CO6 The learner will realize the importance of biomolecules and their clinical significance

**Course (Paper) Name: Economic Zoology**

CO1 Learners would understand the basics of the functioning of sericulture industry and its scope in India

CO2 Learner shall gain knowledge on the varieties of silkworms, host-plants and aspects on silk extraction and the diseases afflicting silk -worms

CO3 Learners would understand about the dairy development in India

CO4 Learner shall secure the knowledge about dairy processing

CO5 Learner shall gain knowledge about milk and milk products

CO6 Learners can comprehend various kinds of aquaculture practices and its scope as fishery resource in India

CO7 Learners will gain the knowledge about Pisciculture, Prawn culture and Pearl culture

**Class: T.Y.B. Sc. Zoology**

**Semester V**

**Course (Paper) Name : Haematology and Immunology**

- CO1 Learner shall be familiar with the fundamental concepts in haematology.
- CO2 Learner shall comprehend basic haematology
- CO3 Learner will be able to identify various components of haemostatic systems
- CO4 Learners shall get familiar with different terminologies and diagnostic tests performed in a pathological laboratory
- CO5 Learners will be acquainted with diagnostic approaches in haematological disorders
- CO6 Learners will be better equipped for taking any further pathological course or working in a diagnostic laboratory.
- CO7 Learners would comprehend the types of immunity and the components of immune system.
- CO8 Learners would realize the significant role of immune system in giving resistance against diseases and to introduce the concept of vaccines and vaccination.

**Course (Paper) Name - Mammalian Histology, Toxicology, General Pathology and Biostatistics**

- CO1 Learners would appreciate the well planned organization of tissues and cells in the organ systems.
- CO2 The course will prepare learners to develop broad understanding of the

different areas of toxicology

- CO3 It will also develop critical thinking and assist students in preparation for employment in pharmaceutical industry and related areas
- CO4 Learners will be familiar with various medical terminologies pertaining to pathological condition of the body caused due to diseases
- CO5 The learners will be able to collect, organize and analyse data using parametric and non- parametric tests.
- CO6 They will also be able to set up a hypothesis and verify the same using limits of significance.

### **Course (Paper) Name and No.: Taxonomy of Invertebrates**

- CO1 Develop an understanding of the characters used to classify besides being able to differentiate the organisms belonging to different taxa.
- CO2 The learners will be familiarized with classification up to phylum Aschelminthes along with their examples
- CO3 Have hands on experience of materials demonstrating the diversity of protists and non-chordate
- CO4 Learners will understand the relative position of individual organs and associated structures
- CO5 Learners can realize that very similar physiological mechanisms are used in very diverse organisms.
- CO6 Get a flavor of research by working on project related to invertebrates

**Course (Paper) Name – Integumentary system, Human Osteology and Limb muscles and Developmental Biology of Chick**

- CO1 Learners would appreciate the well planned organization of tissues and cells in the organ systems.
- CO2 Learners will be able to understand the importance of epidermal and dermal derivatives and their function
- CO3 Learners will be able to know about the structure and types of muscles of long bones in human limbs
- CO4 Learners will be familiar about muscle injuries and muscle syndromes
- CO5 Students should learn about basic concept of and principles of developmental biology
- CO6 students should understand complete details about the structures, development of Chick embryo

**Semester VI**

**Course (Paper) Name- Enzymology, Homeostasis, Endocrinology and Tissue culture**

- CO1 Learners shall be able to understand basics of enzyme structure and function.
- CO2 Learners will be able to comprehend variations in enzyme activity and kinetics.
- CO3 Learners shall appreciate the enzyme assay procedures and the therapeutic application of enzymes.
- CO4 Learners shall comprehend the adaptive responses of animals to environmental changes for their survival.

CO5 Learners shall be able to understand the types & secretions of endocrine glands and their functions.

The learners shall understand the significance of tissue culture as a tool in specialized areas of research.

CO6 The learners will appreciate its applications in industries like biotechnology, in fields such as in-vitro fertilization and replacement of animals in medical and toxicology experiments.

**Course (Paper) Name – Molecular biology , Genetic engineering , Human genetics, and Bioinformatics**

CO1 Learner shall get an insight into the intricacies of chemical and molecular processes that affect genetic material.

CO2 The course shall prepare learner to recognize the significance of molecular biology as a basis for the study of other areas of biology and biochemistry

CO3 Learner shall also understand related areas in relatively new fields of genetic engineering and biotechnology

CO4 The learners shall get acquainted with the vast array of techniques used to manipulate genes which can be applied in numerous fields like medicine, research, etc. for human benefit

CO5 Acquire knowledge of various databases of proteins, nucleic acids. Primary, secondary and composite databases. BLAST, FASTA

CO6 Learner shall become aware of the computational point of view of studying the genomes.

**Course (Paper) Name – Phylum Chordata, Group- Euchordata I & II and Type Study -Sepia**

- CO1 Develop understanding on the diversity of life with regard to protists, non-chordates and chordates.
- CO2 Group animals on the basis of their morphological characteristics/ structures.
- CO3 Learners will get an idea of origin of Non Chordates, its taxonomy up to class with reference to phylogeny and their special features.
- CO4 Learners will learn about general characters and classification of protochordates
- CO5 Learners will get an idea of Euchordata along with their classes
- CO6 Learners will understand the characteristic features and examples of class reptilian ,Aves and Mammalia
- CO7 The learners shall get acquainted with vertebrates by type study -Shark

**Course (Paper) Name – Environment and wildlife management, Bio prospecting , Zoo pharmacognosy and Zoogeography**

- CO1 Learners will be able to understand the basics of wildlife conservation
- CO2 The learners shall get acquainted with various threats to wildlife
- CO3 Learners will learn the techniques of and methods of wild life conservation
- CO4 Learners will understand the paradigms of discovery and commercialization of biological resources and knowledge gained by self-medication by animals
- CO5 Learners will understand the different factors affecting environment, its impact and environment management laws.

- CO6 Learners will be able to understand the wildlife habitat projects for animal protection
- CO7 The learners will become acquainted with how and why different animal species are distributed around the globe

**Course (Paper) Name: Applied Component I: Fishery Biology**

- CO1 Learners will get information about Navigational & sea safety equipments
- CO2 The learners will become acquainted with Oceanographic Instruments
- CO3 Learners will understand the basic physical, chemical & biological oceanography
- CO4 Learners will learn about crafts and gears used in fishery
- CO5 Learner will get knowledge of Farming of Major Carps and Introduction to other Commercial Aquaculture Practices in Fresh Water
- CO6 The learners will become acquainted with Marketing & financial aspect of fishery

**Course (Paper) Name: Applied Component II: Fishery Biology**

- CO1 Learner shall understand deep sea and coastal fishes.
- CO2 Learner shall understand commercial potential and know about the major landing centers of the fishes
- CO3 Learner shall understand crustacean and molluscan fisheries
- CO4 Learner shall understand the performance of landing centers of above fisheries
- CO5 Learner will gain sound knowledge about the fish by-products and value-

added products.

CO6 Learner will explore good manufacturing practices while manufacturing these products

CO7 Learner will understand the selection process of hatchery sites and various types of designs and construction of aquaculture farm practices.

# Department of Mathematics

## Course Outcomes

### Class: F.Y.B. Sc. Mathematics

#### Semester I

#### Course (Paper) Name and No.: Calculus & Paper I

- CO1 Students will be able to understand the real number system and Arithmetic Mean-Geometric Mean.
- CO2 Students will be able to grasp the concept of sequence and subsequence.
- CO3 Students will be able to learn the differential equation of first order and first degree.
- CO4 Students will be able to solve the differential equations.

#### Course (Paper) Name and No.: Algebra & Paper II

- CO1 Students will be able to understand the basic concept of set theory.
- CO2 Students will be able to grasp the concept of relations and functions.
- CO3 Students will be able to apply Well-ordering property, Induction theorems and Binomial theorem.
- CO4 Students will be able to learn the divisibility and congruence relations.

## Semester II

### Course (Paper) Name and No.: Calculus & Paper I

- CO1 Students will be able to grasp the concept of limit and continuity.
- CO2 Students will be able to understand the differentiation at a point.
- CO3 Students will be able to apply chain rule to find derivative of composite functions.
- CO4 Students will be able to determine local maxima, local minima, stationary points using second derivative test.

### Course (Paper) Name and No.: Algebra & Paper II

- CO1 The Students will be able to solve the system of linear equations using different methods like Gaussian elimination, Gauss Seidal.
- CO2 Students will be able to find symmetries and permutations.
- CO3 The Students will be able to grasp properties of polynomials and the relation between roots and coefficients.
- CO4 Students will be able to find roots of the polynomials by using different method and applications of polynomial.

## **Class: S.Y.B. Sc. Mathematics**

### **Semester III**

#### **Course (Paper) Name and No.: Calculus-III & Paper I**

- CO1 Students will be able to understand functions of several variables, limits and continuity.
- CO2 Students will be able to grasp the concept of limit and continuity for the functions of several variables.
- CO3 Students will be able to learn differentiability of a scalar field at a point.
- CO4 Students will be able to understand applications of Functions of several variables.

#### **Course (Paper) Name and No.: Algebra-III & Paper II**

- CO1 Students will be able to grasp the concept of vector spaces over  $\mathbb{R}$  and subspaces.
- CO2 Students will be able to understand linear transformations and matrices.
- CO3 Students will be able to verify Rank-Nullity Theorem.
- CO4 Students will be able to find Cofactor and Minors of a matrix, area and volume using determinant.

#### **Course (Paper) Name and No.: Discrete Mathematics & Paper III**

- CO1 Students will be able to grasp the concept of graph.
- CO2 Students will be able to understand the properties and applications of graph.
- CO3 Students will be able to learn finite, countable, uncountable sets and applications preliminary counting.
- CO4 Students will be able to solve examples using Binomial and multinomial theorem, Principal of inclusion exclusion, derangements.

## Semester IV

### Course (Paper) Name and No.: Calculus-IV & Paper I

- CO1 Students will be able to grasp the concept of Riemann integration.
- CO2 Students will be able to learn criteria of Riemann integrability.
- CO3 Students will be able to understand the indefinite and improper integrals.
- CO4 Students will be able to learn the applications of Riemann integrals.

### Course (Paper) Name and No.: Algebra-IV & Paper II

- CO1 Students will be able to understand the concept of inner product space over  $\mathbb{R}$ .
- CO2 Students will be able to find Eigenvalues and Eigenvectors.
- CO3 Students will be able to grasp the concept of Diagonalization.
- CO4 Students will be able to learn the concept of Orthogonal Diagonalization.

### Course (Paper) Name and No.: Ordinary Differential Equation & Paper III

- CO1 Students will be able to solve second order linear differential equations.
- CO2 Students will be able to learn the linear System of Ordinary Differential equations.
- CO3 Students will be able to apply power series method for solving linear System of Ordinary Differential equations.
- CO4 Students will be able to understand the applications of ordinary differential equations.

# Department of Physics

## Course Outcomes

Class: F.Y.B. Sc. Physics

### Semester I

#### Course (Paper) Name and No.: Classical Physics, Basic Electrodynamics, Thermodynamics, Physics 1

- CO1 Understand Newton's laws and apply them in calculations of the motion of simple systems.
- CO2 Use the free body diagrams to analyse the forces on the object.
- CO3 Understand the basic mathematical concepts and applications of them in physical situations
- CO4 Apply the laws of thermodynamics to formulate the relations necessary to analyze a thermodynamic process
- CO5 Understand the elasticity and fluid dynamics concepts and its applications in practical life

#### Course (Paper) Name and No.: Nuclear Physics & Analog Electronics, Physics 2

- CO1 Learners will get detailed knowledge about the discovery of the nucleus and learn all the properties of the nucleus.
- CO2 Learners will understand the phenomenon of Radioactivity, Radioactive elements, laws of Radioactive Decay and their applications to various fields of science.
- CO3 Learners will understand various kinds of Nuclear Reactions, Various laws related to Nuclear Reactions and how Nuclear Energy is produced.
- CO4 Learners will understand the Principles, Construction and Working of various types of Nuclear Detectors.

- CO5 Learners will understand the response of Resistor, Capacitor and Inductor to an Alternating Current (AC)
- CO6 Learners will understand various kinds of AC Bridges and their Operation.

**Course Name and No.: Practicals**

- CO1 Learners will get hands-on training on various measuring devices such as Digital Multimeter, Vernier Caliper, Micrometer Screw Gauge, Travelling Microscope and other such devices.
- CO2 Learners will understand various methods for finding different mechanical properties of Solids like the Moment of Inertia, Modulus of Elasticity and the Young's Modulus.
- CO3 Learners will understand various methods for finding different mechanical properties of liquids like the Coefficient of Viscosity, Surface Tension & Angle of Contact.
- CO4 Learners will understand the Thermoelectric Characteristics of Thermistor and be able use it as a temperature sensor.
- CO5 Learners will understand the proper way of connecting various electrical components like Resistors, Inductors, Capacitors, Voltmeter, Ammeter, etc in different types of circuits.
- CO6 Learners will practically understand the response of Resistor, Capacitor and Inductance to an Alternating Current. Also the learners will get Hands-On Training for handling such electrical components.

## Semester II

### Course (Paper) Name and No.: Optics, Mathematical physics, Wave Motion, Physics 1

- CO1 Able to explain natural physical processes related to light waves
- CO2 Use of understanding application of basic differential equation in various circuits
- CO3 Able to differentiate the transverse and spherical waves
- CO4 Able to apply superposition principle for various harmonic oscillations
- CO5 Able to differentiate the different aberrations of light and understands the various methods to eliminate it

### Course (Paper) Name and No.: Modern Physics, DC Circuits & Digital Electronics, Electrostatics, Magnetostatics, Geophysics, Physics 2

- CO1 After the completion of the course learners will get knowledge about Quantum Physics, Geophysics, and Electrodynamics
- CO2 This course will also develop the skills among the learners to handle D.C. circuits and Digital Circuits
- CO3 Learners will be able to do the circuit analysis using various network theorems.
- CO4 Learners will understand the concept of Electrostatic field in detail.
- CO5 Learners will understand the concept of Magnetic fields in detail

### Course Name and No.: Practicals

- CO1 Learners will get demonstration of various Phenomenons such as LASER Beam Diversion, Charging & Discharging of Capacitor, Conservation of Angular Momentum, etc.
- CO2 Learners will understand how to use various Optical Instruments such as the Spectrometer, Prism, Lenses, etc.

- CO3 Learners will be able to determine Optical properties like the Refractive Index of the material of the Prism by observing the Spectrum emitted by different sources of light.
- CO4 Learners will get hands-on training on how lenses are used and how to find various properties of the lens systems.
- CO5 Learners will be able to use Diodes for the purpose of Voltage Regulations and for converting an AC signal into a DC signal (Rectification).
- CO6 Learners will get hands-on training of Digital Electronic Circuits and study their Applications.

## **Class: S.Y.B. Sc. Physics**

### **Semester III**

#### **Course (Paper) Name and No.: Classical Mechanics & Thermodynamics, Physics-1**

- CO1 Learners will understand the Laws of Conservation Linear Momentum, Angular Momentum & Energy and be able to apply the laws to study the Dynamics of System of Particles.
- CO2 Learners will be able to understand the Simple Harmonic Oscillations of Simple Pendulum & Compound Pendulum and write their equations.
- CO3 Learners will understand the Simple Harmonic Motion and the effect of Damping forces on such motions and equation of motion related to particles performing Damped Simple Harmonic Motion.
- CO4 Learners will understand the Forced Damped Simple Harmonic Motion and Resonance.
- CO5 Learners will understand various Laws of Thermodynamics and their implications in daily life.
- CO6 Learners will understand various Thermodynamic Processes and various Thermodynamic Cycles (P-V graph).
- CO7 Learners will understand the Construction & Working of different types of Heat Engines and the Thermodynamical Processes inside the heat engines.

#### **Course (Paper) Name and No.: Vector Calculus, Analog Electronics, Physics 2**

- CO1 Understand learners the basic concepts of Mathematical physics and their applications in physical situations
- CO2 Understand the basics of transistor biasing, Op-Amp and their applications
- CO3 Understand different types of oscillator and find its frequency.
- CO4 Evaluate line and surface integrals
- CO5 Apply Fundamental Theorem of Line Integrals, Green's Theorem, Stokes' Theorem, or

Divergence Theorem to evaluate integrals

CO6 Design basic amplifier circuits using Opamp

**Course (Paper) Name and No.: Acoustics, Laser, Fibre optics, Crystal Physics, Material Physics, Geophysics, Physics-3**

CO1 After the completion of the course learners will understand the Factors affecting Acoustics and use of fibre in optical communication

CO2 learners will also understand the different types of crystal structures

CO3 Learners will understand propagation of light through Optical Fiber, Different types of fibre and Application of Optical Fiber

CO4 Learners will understand working of Laser and also application of Laser in Holography

CO5 Learners will understand the Electrical and Magnetic properties of the materials

CO6 Learners will understand the concepts of Continental drift, Plate tectonics and cause of Earthquake

**Course Name and No.: Practicals**

CO1 Learners will understand to test electronic components like resistor, capacitor, diode, transistor etc.

CO2 learners will understand how to connect electronic circuit using Breadboard

CO3 Learners will understand how to use Cathode ray oscilloscope (CRO) to measure time period and amplitude of different waveforms

CO4 Learners will develop the skill to use transistor as an amplifier in common emitter mode (CE mode)

CO5 Learners will understand the working of passive filter like RC Low Pass Filter, RC Low Pass Filter, RC Band Pass Filter using Breadboard

CO6 Learners will develop the skill to use IC 741 (Op-Amp) as a Inverting amplifier, Non-inverting amplifier, Differential amplifier and Voltage follower

CO7 Learners will develop the skill to determine Young's modulus, Thermal conductivity,

Moment of inertia, Surface tension and Acceleration due to gravity (g)

CO8 Learners will understand Brewster's Law using Polarisation by reflection method

## Semester IV

### Course (Paper) Name and No.: Optics, Physics-1

CO1 Learners will understand various natural phenomenon related to light like Interference, Diffraction, Polarization, etc.

CO2 Learners will understand the Phenomenon of Interference in details.

CO3 Learners will understand the Principle, Construction and Working Michelson's Interferometer & Feby-Perot Interferometer.

CO4 Learners will be able to differentiate between the Fresnel & Fraunhofer class of Diffraction.

CO5 Learners will understand Fresnel and Fraunhofer class of Diffraction at various obstacles or slits.

CO6 Learners will understand the phenomenon of Polarization in details and various ways of Polarizing the Light and the applications of Polarized light in daily life.

### Course (Paper) Name and No.: Quantum Mechanics, Physics 2

CO1 Able to understand the postulate of Quantum Mechanics

CO2 Use of Quantum Mechanics , its relevance in explaining significant phenomena in Physics

CO3 Gained knowledge about basic non-relativistic quantum mechanics, the time-dependent and time-independent Schrödinger equation for simple potentials like for instance the harmonic oscillator and hydrogen like atoms

CO4 Solve the time-independent Schrodinger equation as an intermediate step to solve the time-dependent Schrodinger equation.

CO5 apply boundary conditions to constraint the set of possible states.

CO6 Find the transmission and reflection coefficients for one-dimensional barriers

## **Course (Paper) Name and No.: Digital Electronics, Radio Communication, Physics-3**

- CO1 Learners will understand the different types of Number systems like Binary, Octal, Hexadecimal
- CO2 After the completion of the course learners will develop the skill of programming using microprocessor 8085
- CO3 Learners will also understand the various modulation techniques used in the communication system
- CO4 Learners will understand different types of Flip-Flops
- CO5 Learners will understand the working of shift registers and counters
- CO6 Learners will understand different types of Addressing modes used in microprocessor 8085

## **Course Name and No.: Practicals**

- CO1 Learners will get the demonstration of Waveform generator using Op-amp
- CO2 Learners will develop the skill of Error analysis of Physics experiments
- CO3 Learners will be able to determine the Resolving power of telescope, Resolving power of grating
- CO4 Learners will understand the working of MS-JK flip flop (IC 7476), Latch (IC 7400/IC 7402)
- CO5 Learners will be able to do Programming using 8085 microprocessor
- CO6 Learners will understand the working of Op-amp as a Differentiator and Integrator
- CO7 Learners will understand the working of 8:3 Priority Encoder (IC 74LS148) and 3:8 Decoder (IC 74LS138)
- CO8 Learners will be able to determine the wavelength of the monochromatic light using Cylindrical obstacle and Fresnel's biprism
- CO9 Learners will understand the working of Half adder and full adder using EX-OR gate

# Department of Botany

## Course Outcomes

Class: F.Y.B. Sc. Botany

### Semester I

#### Course (Paper) Name and No.: Plant Diversity I

- CO1 Identify and differentiate between the different plant groups.
- CO2 Understand the ecological and economic importance of each of the different plant groups.
- CO3 Describe general characteristics of Class Cyanophyceae and Chlorophyceae and write down lifecycle of *Nostoc* and *Spirogyra*
- CO4 Describe general characteristics of Class Phycomycetae and write down lifecycle of *Saprolegnia* and *Rhizopus*.
- CO5 Describe general characteristics of Class Hepaticae and write down lifecycle of *Riccia*

#### Course (Paper) Name and No.: Form and Function I

- CO1 Describe eukaryotic plant cell.
- CO2 Describe the ultrastructure of cell wall, cell membrane, mitochondria, chloroplast and endoplasmic reticulum.
- CO3 Understand the concept of ecosystem, food chain, food web, and energy flow.
- CO4 Identify and study the characteristics of different terrestrial and aquatic ecosystems
- CO5 Understand concepts in Mendelian genetics.
- CO6 Understand concepts in non-mendelian genetics, epistasis and multiple allelism.

## Semester II

### Course (Paper) Name and No.: Plant Diversity I

- CO1 Identify and differentiate between the different plant groups.
- CO2 Understand the ecological and economic importance of each of the different plant groups.
- CO3 Describe stelar evolution; write down general characteristics of Pteridophytes and lifecycle of *Nephrolepis*.
- CO4 Identify general characteristics of Class Cycadophyta and write down lifecycle of *Cycas*.
- CO5 Describe inflorescence morphology and write down general characteristics, leaf morphology, diagnostic features and economic importance of angiospermic families Cruciferae, Apocynaceae, Euphorbiaceae and Amaryllidaceae.

### Course (Paper) Name and No.: Form and Function I

- CO1 Describe the simple permanent tissues.
- CO2 Describe the epidermal tissue system, epidermal appendages and primary structure of dicot and monocot root, stem and leaf.
- CO3 Understand the concept of water potential, solute potential, matric potential and pressure potential.
- CO4 Understand enzyme inhibition, kinetics and mechanism of enzyme action and write down classification of enzymes.
- CO5 Understand concepts of primary and secondary metabolites.
- CO6 Write down the sources, parts used, active constituents and medicinal uses of adulsa, tulsi, ginger, turmeric, sandalwood and aloe.

## Class: S.Y.B. Sc. Botany

### Semester III

#### Course (Paper) Name and No.: Plant Diversity II

- CO1 Describe the general characters of division Phaeophyta and various pigments in Algae.
- CO2 Describe the systematic position and write down the life cycle of *Sargassum* and *Dictyota*
- CO3 Describe general characters of class Ascomycetae and write down life cycle of *Xylaria* and *Aspergillus* and causal organism, symptoms, disease cycle and control measures of powdery mildew and late blight of potato.
- CO4 Understand the classification, structure, reproduction and ecological and economic importance of lichens.
- CO5 Describe the general characters of Class Anthocerotae and Class Musci.
- CO6 Describe and write down the systematic position and life cycle of *Anthoceros* and *Funaria*.

#### Course (Paper) Name and No.: Form and Function II

- CO1 Understand concepts of modern techniques of studying plant diversity such as wet and dry preservation and light and electron microscopy.
- CO2 Understand the concepts of paper and thin-layer chromatography and electrophoresis
- CO3 Describe the ultrastructure and functions of Microbodies and Ribosomes.
- CO4 Understand cell division, its significance and the types and structure of nucleic acids.
- CO5 Describe chromosomal aberrations and different methods of sex determination, sex linked, sex influenced and sex limited traits.
- CO6 Understand the concept of extra-chromosomal inheritance.

## Course (Paper) Name and No.: Current Trends in Plant Sciences I

- CO1 Describe Indian Pharmacopoeia, and understand its significance.
- CO2 Understand the sources, properties and uses of different secondary metabolites and describe the concept and applications of aromatherapy
- CO3 Describe agroforestry, organic farming, urban forestry and Silviculture and understand the sources, types and uses of fibers.
- CO4 Describe nutraceuticals and herbals and their uses and plant enzyme based industry.
- CO5 Describe DNA replication in prokaryotes and eukaryotes.
- CO6 Describe transcription of RNA and post transcriptional processing

## Semester IV

### Course (Paper) Name and No.: Plant Diversity II

- CO1 Describe general characters of division Psilophyta and Lepidophyta and understand the life cycle of *Selaginella*.
- CO2 Understand the concept of Palaeobotany with respect to geological time scale, types of fossils and structure of *Rhynia*.
- CO3 Describe the salient features, classification upto orders and economic importance of Coniferophyta; and write down the systematic position and lifecycle of *Pinus*.
- CO4 Describe the structure and systematic position of form genus *Cordaites*
- CO5 Understand the relation between Taxonomy and Anatomy, Palynology, Embryology, Ecology, Cytology and Phytochemical constituents and write down the objectives of plant systematics and nomenclature.
- CO6 Describe the morphological and diagnostic characteristics and economic importance of Families Leguminosae, Rubiaceae, Nyctaginaceae and Palmae.

## **Course (Paper) Name and No.: Form and Function II**

- CO1 Describe normal secondary growth in dicot root and stem and mechanical tissue system.
- CO2 Understand different types of vascular bundles.
- CO3 Understand respiration and photosynthesis.
- CO4 Understand the concept of photorespiration.
- CO5 Describe carbon, nitrogen and water cycles
- CO6 Describe soil as an edaphic factor and qualitative and quantitative characters of community.

## **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 anther culture.
- CO4 Understand the concept of gene cloning with reference to enzymes and vectors used in gene cloning
- CO5 Describe Chi square test and coefficient of correlation.
- CO6 Describe the concept of Bioinformatics.

## 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

## Course Outcomes

Class: M.Sc. I Chemistry

### Semester I

#### Course (Paper) Name and No.: Physical Chemistry

- CO1 Memorize concept Maxwell equations, Maxwell thermodynamic Relations; it's significance
- CO2 Understand Joule Thomson coefficient in terms of van der Waals constants.
- CO3 Apply Third law of Thermodynamics to find out absolute entropy
- CO4 Know Classical Mechanics, failure of classical mechanics: Need for Quantum Mechanics
- CO5 Understand Schrödinger wave equation as the eigen value equation of the Hamiltonian operator
- CO6 Apply of quantum mechanics for Particle in a one, two- and three-dimensional box
- CO7 Explain the Validity of this equation for aqueous and non- aqueous solution
- CO8 Know the working of Batteries: Alkaline fuel cells, Phosphoric acid fuel cells, High temperature fuel cells [Solid –Oxide Fuel Cells (SOFC) and Molten Carbonate Fuel Cells]

#### Practical's

- CO1 Handle and Understand principles of different instruments like Potentiometry, Conductometry, pH Metry.
- CO2 Determine the heat of solution of sparingly soluble acid.
- CO3 Determine thermodynamic solubility product and solubility product of Calcium Sulphate and calcium Hydroxide respectively
- CO4 From graphical representation identify functions are acceptable or non- acceptable

## Course (Paper) Name and No.: Organic Chemistry

- CO1 Students will be able to learn Thermodynamic and kinetic requirements of a reaction rate and equilibrium constants, reaction coordinate diagram, transition state (activated complex), nature of activated complex,
- CO2 Student can be able to learn Factors affecting acidity and basicity: Electronegativity and inductive effect, resonance, bond strength, electrostatic effects, hybridization, aromaticity and solvation.
- CO3 Understand benzyne mechanism
- CO4 Understand S<sub>N</sub>Ar and S<sub>N</sub>Ar<sup>1</sup>
- CO5 Discuss Molecules with two or more chiral centers
- CO6 Understand oxidation of alcohol to aldehyde and ketones
- CO7 Understand reduction by using metals.
- CO8 Explain mechanism of Wolf-Kishner reduction and Clemmensen's Reduction.

### Practical's

- CO1 Understand practical aspect of preparation of organic compounds.
- CO2 Able to do planning of organic synthesis.
- CO3 Can write down reactions.
- CO4 Understand purification of organic compound by recrystallization, sublimation etc.
- CO5 Perform thin layer chromatography for checking Purity of product.
- CO6 Able to take melting point of the product.

## Course (Paper) Name and No.: Analytical Chemistry

- CO1 Student will get an idea about basics of Analytical chemistry, quality management system, safety in laboratories, accreditation processes and GLP
- CO2 Student will understand the concept of chemical calculations, which are used in estimation of concentration, pH, solubility constant of various solutions
- CO3 Student will understand the principle, instrumentation and applications of various types of spectroscopic techniques

CO4 Student will learn the principle of different thermal analytical method (i.e. TGA, DTA and DSC).

#### **Practical's**

CO1 Student will learn non-instrumental methods of quantitative estimation

CO2 Students will get practical knowledge for determination of various parameters related to ion exchange chromatography

CO3 Students will learn treatment and interpretation of analytical data

## **Semester II**

### **Course (Paper) Name and No.: Physical Chemistry**

CO1 Understand Fugacity of real gases, Determination of fugacity of real gases

CO2 Explain Real solutions: Chemical potential in non-ideal solutions excess functions of non-ideal solutions

CO3 Derive expressions for the total wave function for 1s, 2s, 2p and 3d orbitals of hydrogen.

CO4 Write Hückel Molecular Orbitals theory for ethylene, 1,3-butadiene and benzene.

CO5 Know enzyme action on rate of reaction.

CO6 Explain Inhibition of Enzyme action: Competitive, Non-competitive and Uncompetitive Inhibition. Effect of pH, Enzyme activation by metal ions, Regulatory enzymes

CO7 Explain Reaction in Gas Phase i.e. Unimolecular Reactions: Lindeman-Hinshelwood theory, Rice-Ramsperger-Kassel (RRK) theory.

CO8 Explain Gibbs Phase rule, Two component system, Three component system

#### **Practical's**

CO1 Handle and Understand principles of different instruments like Potentiometry, Conductometry, pH Metry and colorimeter

CO2 Study Phase diagram of three component system.

CO3 With the help of Dilatometer determine rate constant of decomposition reaction of diacetone alcohol.

CO4 From graphical representation identify Shape of Orbitals.

## Course (Paper) Name and No.: Organic Chemistry

- CO1 Understands regioselectivity in enolate formation
- CO2 Gain knowledge of alkylation of enolates
- CO3 Students can able to understands Applications of FMO concepts in (a) SN2 reaction, (b) Lewis acid base adducts (BF<sub>3</sub>-NH<sub>3</sub> complex), (c) ethylene dimerization to butadiene, (d) Diels-Alder cycloaddition, (e) regioselective reaction of allyl cation with allyl anion (f) addition of hydride to formaldehyde.
- CO4 Students will learn about the Principle and applications of ultraviolet spectroscopy.
- CO5 To understand the infra-red spectroscopy in organic structure determination
- CO6 Students can able to learn Factors affecting the position and intensity of UV bands – effect of conjugation, steric factor, pH, and solvent polarity.
- CO7 Calculation of absorption maxima for above classes of compounds by Woodward-Fieser rules (using Woodward-Fieser tables for values for substituents).
- CO8 To learn about the Principle and applications of Infrared spectroscopy.

### Practical's

- CO1 Able to identify chemical type of component present in binary mixture.
- CO2 Able to separate components from binary mixture.
- CO3 Can perform fractional distillation.
- CO4 Can purify organic compounds by recrystallization method.
- CO5 Can identify the functional group of organic compound.
- CO6 Able to take melting point of separated components.

## Course (Paper) Name and No.: Analytical Chemistry

- CO1 Student will get conversant with advanced separation techniques and theoretical aspects involved
- CO2 Student will learn advanced spectroscopic techniques (i.e. X-ray spectroscopy, mass spectrometry etc.)
- CO3 Student will study of detail principle, instrumentation and applications of surface

techniques of analysis

CO4 Student will understand the concept of various types of electro-analytical techniques

**Practical's**

CO1 Students will perform various instrument based analysis

CO2 Students will learn different methods of spectrophotometric determination

CO3 Students will learn graphical interpretation of data

# 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

## Course Outcomes

### Class: M.Sc. II Analytical Chemistry

#### Semester III

#### Course (Paper) Name and No.: Analytical Chemistry I

- CO1 Students will understand theoretical aspects of sampling, pre-treatment and method validation
- CO2 Student will get knowledge of how to measure uncertainty in measurements, dealing with signal to noise ratio and legislator aspects of pharmaceutical industries
- CO3 Students will learn the principle of different separation techniques and their applications in various fields

#### Practical's

- CO1 Students will learn the instrument based analysis of various types of samples
- CO2 Students will learn graphical representation of the data

#### Course (Paper) Name and No.: Analytical Chemistry II

- CO1 Student will help to understand the theoretical concepts of surface analytical techniques
- CO2 Student will understand advanced spectroscopic techniques used for characterization of matter
- CO3 Students will get detailed insights of advanced electroanalytical techniques
- CO4 Student will find applications of chemiluminescence, ORD-CD, Photoacoustic spectroscopy in analytical chemistry

#### Practical's

- CO1 Students will learn the various analytical techniques for pharmaceutical analysis
- CO2 Students will get acquainted with the analysis of biological samples

### **Course (Paper) Name and No.: Analytical Chemistry III**

- CO1 Student will learn bioanalytical techniques of analysis
- CO2 Student will understand the immunological methods & theoretical basic of methods.
- CO3 Student will get general idea about food processing, food preservation and determination of food contaminant etc
- CO4 Student will understand technique use in food packaging and food analysis

#### **Practical's**

- CO1 Students will perform practical's based upon food analysis
- CO2 Students will understand data acquisition and analysis

### **Course (Paper) Name and No.: Analytical Chemistry IV**

- CO1 Student will learn different aspects of analysis of air pollutants
- CO2 Student will understand the quality and requirement of potable water of bore well and bottle mineral water
- CO3 Student will study the details of sources and hazardous of soil pollutant, noise pollutant, thermal pollutant, radioactive pollutant etc
- CO4 Student will do the detail study of insecticides, pesticides, soaps, detergents and petrochemical products and their effects on environment
- CO5 Student will get general idea regarding the pharmaceutical analysis and quality control methods of pharmaceutical industry
- CO6 Student will know the details of drug analysis on the basis of functional groups and other factors
- CO7 Student will understand the applications of analytical chemistry in forensic science
- CO8 Student will learn the various aspects of cosmetic industry and analysis of different type cosmetics.

#### **Practical's**

- CO1 Students will perform the metallurgical analysis
- CO2 Students will deal with the experiments related with environmental pollution

## Semester IV

### Course (Paper) Name and No.: Analytical Chemistry I

- CO1 Student will learn details of various separation processes
- CO2 Student will study the separation, analysis and standardization of herbal based products
- CO3 Student will get conversant with the principle, advantages and challenges of green chemistry
- CO4 Student will understand the concept of electrophoresis in analysis and basics of nanotechnology

#### Practical's

- CO1 Student will understand the use of instrumental methods for the analysis of metallurgical samples as well as other samples

### Course (Paper) Name and No.: Analytical Chemistry II

- CO1 Student will do the detail study of principle, instrumentation and applications of NMR spectroscopy
- CO2 Student will understand the detail concept of mass spectroscopy and Raman spectroscopy
- CO3 Student will learn principle and interfacing of radio analytical techniques and hyphenated thermal methods
- CO4 Student will know the detail concept of hyphenated techniques including GC-MS, GC-IR, LC-MS, HPLC-MS etc

#### Practical's

- CO1 Student will learn the quantitative estimation of pharmaceutical products
- CO2 Students will get knowledge of quality control methods and understand the importance of accuracy

### **Course (Paper) Name and No.: Analytical Chemistry III**

- CO1 Student will learn the different aspects of effluent treatment
- CO2 Student will understand steps involved in solid waste management
- CO3 Student will get an idea about classifications and applications of plastics, polymer, paints and pigments and their environmental impact
- CO4 Student will study metallurgical analysis

#### **Practical's**

- CO1 Students will learn quantitative estimation of various types of food samples

### **Course (Paper) Name and No.: Analytical Chemistry IV**

- CO1 Student will learn about details intellectual property
- CO2 Student will get knowledge of intellectual property rights (IPR).
- CO3 Student will understand concepts in cheminformatics
- CO4 Student will learn the drug designing and traits in it
- CO5 Student will learn every aspect of publication of research paper such as terms associated with journals, referencing and library resources
- CO6 Student will get conversant with the methods of data analysis and various softwares employed for it
- CO7 Student will get knowledge of actual writing scientific papers
- CO8 Student will get information of the safety and ethical handling of chemicals

#### **Practical's**

- 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

# 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

## Course Outcomes

### Class: M.Sc. II Organic Chemistry

#### Semester III

#### Course (Paper) Name and No.: Organic Chemistry I

- CO1 Describe organic reactive intermediates.
- CO2 Explain neighbouring group participation.
- CO3 Understand Woodward- Hoffmann rules.
- CO4 Understand Huckel and Mobius Method.
- CO5 Can draw molecular orbital diagram for ethylene, 1, 3- butadiene etc.
- CO6 Understand the Classification of point groups based on symmetry elements with eg.
- CO7 Appreciate important of: reduction of cyclohexanones (with LiAlH<sub>4</sub>, selectride and MPV reduction) and oxidation of cyclohexanols.
- CO8 Write mechanism of Norrish-I, Norrish-II, Paterno-Buchi reaction, Barton reaction.

#### Practical's

- CO1 Will able to identify chemical type of component present in ternary mixture.
- CO2 Will able to separate components from ternary mixture.
- CO3 Can perform fractional distillation.
- CO4 Can purify organic compounds by recrystallization method.
- CO5 Can identify the functional group of organic compound.
- CO6 Will able to take melting point of separated components.

#### Course (Paper) Name and No.: Organic Chemistry II

- CO1 Identify the name of reaction.
- CO2 Predict the mechanism of given reaction.
- CO3 Define radicals and radical reactions.
- CO4 Define hyper conjugation and recognize its influence on radical stabilities and the

relative ease of radical formation

- CO5 Write mechanism of Wittig reaction, Horner-Wadsworth-Emmons reaction, Barton-Kellogg olefination.
- CO6 Describe  $\alpha$ -CH functionalization by nitro, Sulfoxide, sulfone and phosphonate group.
- CO7 Explain Bamford-Stevens reaction, Julia olefination and its modification
- CO8 Explain regiochemistry of oxymercuration and demercuration of alkene.

#### **Practical's**

- CO1 Will understand practical aspect of preparation of organic compounds.
- CO2 Will be able to do planning of organic synthesis.
- CO3 Can write down reactions.
- CO4 Will understand principle of steam distillation.
- CO5 Can perform steam distillation
- CO6 Will understand principle of vacuum distillation.
- CO7 Can perform vacuum distillation.
- CO8 Can perform column chromatography and thin layer chromatography

#### **Course (Paper) Name and No.: Organic Chemistry III**

- CO1 Classification of carbohydrates and types of naturally occurring sugars.
- CO2 Classify the insect pheromones.
- CO3 Understand structure elucidation of prostaglandins.
- CO4 Write down the synthesis of triacontanol.
- CO5 Understand proton NMR spectroscopy.
- CO6 Understand  $^{13}\text{C}$ -NMR spectroscopy.
- CO7 Can solve problems based on UV, IR,  $^1\text{H}$ NMR and  $^{13}\text{C}$ -NMR.
- CO8 Understand two dimensional spectroscopic techniques.

## Course (Paper) Name and No.: Organic Chemistry IV

- CO1 Understand the basic terms used in medicinal chemistry.
- CO2 Describe pharmacokinetics.
- CO3 Explain computer added molecular graphics based drug design.
- CO4 Understands the general pathway of amino acids biosynthesis.
- CO5 Synthesize the malonyl CoA, saturated fatty acids, prostaglandins and aromatic polyketides by acetate pathway.
- CO6 Explain preparation of organic compounds by use of green reagents, green catalyst and green solvent.
- CO7 Understand solid state reactions.
- CO8 Describe the use of nanocatalyst in green synthesis.

## Semester IV

### Course (Paper) Name and No.: Organic Chemistry I

- CO1 Explain linear free energy relationship for determination of organic reaction mechanism.
- CO2 Write Hammett equation and Yukawa-Tsuno equation.
- CO3 Explain methods for determination of enantiomer and diastereomer composition.
- CO4 Explain synthesis of L-DOPA.
- CO5 Give Cram's rule.
- CO6 Explain Felkin-Anh model.
- CO7 Explain reduction of prochiral carbonyl compounds and olefins.
- CO8 Give use of chiral BINOLs, BINAPs.

#### Practical's

- CO1 Will understand practical aspect of preparation of organic compounds by two steps.
- CO2 Will be able to do planning of organic synthesis.
- CO3 Can write down reactions.

- CO4 Will understand purification of organic compound by recrystallization, sublimation etc.
- CO5 Can perform thin layer chromatography for checking Purity of product.
- CO6 Will able to take melting point of the product.

### **Course (Paper) Name and No.: Organic Chemistry II**

- CO1 Understand the concept of protection and deprotection in organic synthesis.
- CO2 Able to do planning of synthesis.
- CO3 Understand the term of retrosynthesis.
- CO4 Explain role of Palladium in organic synthesis.
- CO5 Write mechanism of olefin metathesis using Grabb's catalyst.
- CO6 Explain application of Ni, Co, Fe, Rh and Cr carbonyls in organic synthesis.
- CO7 Describe application of samarium iodide in reduction of organic halide, aldehyde and ketones,  $\alpha$ -functionalized carbonyl and nitro compounds.
- CO8 Understand the application/role of Ce (IV) in synthesis of heterocyclic quinoxaline derivatives

#### **Practical's**

- CO1 Student will able to interpret spectral data for organic compounds.
- CO2 Student will able to determine the molecular formula of organic compound from 13-rule or by percentage of elements present.
- CO3 Student will able to predict the functional group peaks from IR spectrum.
- CO4 Student can calculate molar absorptivity of compound from U.V spectrum.
- CO5 Student can interpret CMR , PMR and Mass spectrum

### **Course (Paper) Name and No.: Organic Chemistry III**

- CO1 Discuss Structural and stereochemical features of different kinds of steroids.
- CO2 Explain Biological role of steroids.
- CO3 Write synthesis 16-DPA from cholesterol and plant sapogenin.

- CO4 Understand biological importance of vitamins.
- CO5 Write down synthesis of vitamins.
- CO6 Write down structural elucidation of penicillin-G
- CO7 Student will be able to do nomenclature of heterocyclic compounds.
- CO8 Student will understand structure, reactivity and synthesis of important heterocyclic compounds.

### **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.

# 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

## Course Outcomes

### Class: M. Sc. I Microbiology

#### Semester I

#### Course (Paper) Name and No.: I : Cell Biology and Virology

- CO1 Understand the structure of cell membrane, transport system, intracellular compartments and related trafficking
- CO2 Get more details about mitochondria, chloroplast and cytoskeleton: Structure and function
- CO3 Able to study cells with different microscopic techniques
- CO4 Recognize the characteristics of different types of viruses.
- CO5 Comprehend the complex interaction between viruses and host cells.
- CO6 Theoretical knowledge on techniques employed for culturing and detection of plant viruses.

#### Course (Paper) Name and No.: II: Microbial Genetics

- CO1 The process of gene expression and its regulation
- CO2 The insights of mechanism of DNA duplication in bacteria, mitochondria and chloroplast
- CO3 Inheritance, evolution and gene rearrangements in mitochondrial and chloroplast
- CO4 The molecular tools for studying genetic diseases and the population genetics
- CO5 And apply the skills in research areas involved in microbial genetics

### **Course (Paper) Name and No.: III: Microbial Biochemistry I**

- CO1 Solve problems related to concentrations and preparation of different solutions.
- CO2 Understand the mechanisms involved in protein folding
- CO3 Learners will understand the biochemical mechanism of metabolism of one carbon compound.
- CO4 Use this in-depth knowledge in the research

### **Course (Paper) Name and No.: IV: Medical Microbiology & Immunology**

- CO1 The learners will be able to understand the mechanism, treatment and prevention of disease caused by various newly discovered organisms.
- CO2 The learners will understand the role, importance and Methodology of Epidemiology with respect to infectious diseases.
- CO3 The learners will understand the function of immune response and immune system.
- CO4 The learners will understand the process of inflammation and phagocytosis

## **Semester II**

### **Course (Paper) Name and No.: I: Cell Biology and Virology**

- CO1 Understand the mechanisms of cell cycle, decision, programmed cell death, cell junction and development of multicellular organisms
- CO2 Acquire knowledge of processes such as fertilization, meiosis, sex determination, cell signaling and its components
- CO3 Understand the pathogenesis of viral infection with respect to human health.
- CO4 Understand the basic concept of virological diseases and diagnosis.
- CO5 Understand the role of evolution in new re-emerging viral infection and adaptation.

### **Course (Paper) Name and No.:II: Microbial Genetics-II**

- CO1 Learners will understand the viral classification, replication and transcription which can be useful for the development of Novel vaccine.
- CO2 Learners will learn how microorganisms exchange the genetic material among itself as well as in interspecies.
- CO3 Learners will understand the how bacteria acquire the resistance against antibiotics, drugs as well as Hydrocarbons
- CO4 Learners will know about the emerging Stem cell therapy used as a immunodrug, side effects and development as well as safety precaution used during its handling.
- CO5 Learners will know about the molecular markers used in diagnosis of disease, trans genesis of animal as well as plants.

### **Course (Paper) Name and No.: III: Microbial Biochemistry II**

- CO1 Extraction, purification and analysis of biomolecules
- CO2 Kinetics, regulation and mechanism of enzyme action
- CO3 Mechanism of signaling and response to the stress by bacteria.
- CO4 The biochemical mechanism of pollutant degradation in the environment.
- CO5 Application of this knowledge in the field of enzymatic production and biochemical remediation.

### **Course (Paper) Name and No.:IV: Medical Microbiology & Immunology**

- CO1 The learners will acquire knowledge regarding the mechanism of disease transmission and pathogenesis of emerging infections.
- CO2 The learners will understand the application and role of clinical data management
- CO3 The learners can apply diagnostic skills in identification and diagnosis of pathogen.
- CO4 The learners will understand the importance, mechanism and role of vaccines in disease prevention

## **Class: M. Sc. II Microbiology**

### **Semester III**

#### **Course (Paper) Name and No.:I: Research Methodology**

- CO1 Learners will learn to define a research problem
- CO2 Learners will learn to write research hypothesis
- CO3 Learners will learn to design method of data collection
- CO4 Learners will learn to write scientific report

#### **Course (Paper) Name and No.:II: Food Microbiology**

- CO1 Learners will learn to about interactions between microorganisms and food environment, factors influencing on their growth and survival.
- CO2 Learners will learn about the beneficial role of microorganisms in fermented food and food processing.
- CO3 Learners will learn about importance of microbiological quality control programmes in food production.
- CO4 Learners will learn about standard & procedures for microbiological analysis of food.
- CO5 Learners will learn to identify the different methods used to detect microorganisms, their products in food.

#### **Course (Paper) Name and No.:III: Advances in Biotechnology**

- CO1 Learners will learn about the gene transfer techniques involved in recombinant DNA technology and its application in plant and animal sciences
- CO2 Learners will learn about the use of various polymers in synthesizing nanomaterials and its applications in various fields
- CO3 Learners will learn about the modern techniques in medical fields such as gene therapy, tissue engineering, pharmacogenomics etc
- CO4 Learners will learn to apply the skills for advancement in biotechnology in plant, animal and medical fields

### **Course (Paper) Name and No.: IV: Applied & Environment Microbiology**

- CO1 The learners will gain knowledge of microbial diversity in extreme environment
- CO2 The learners will gain knowledge of significance and importance of organisms in food, food pathogens and develop skills to detect microbial food pathogens.
- CO3 The learners will understand the diversity of microbial ecology and the techniques used for detection of microorganism.
- CO4 The learners will understand the diversity of microorganisms in soil and water

## **Semester IV**

### **Course (Paper) Name and No.: Tools and Techniques: Bio-molecular Analysis**

- CO1 Learners will learn about Spectrophotometric technique
- CO2 Learners will learn about Chromatographic technique
- CO3 Learners will learn about Molecular biology techniques
- CO4 Learners will learn about Nanotechnology Techniques

### **Course (Paper) Name and No.: Pharmaceutical Microbiology**

- CO1 Learners will gain in-depth knowledge about GMP, quality management and regulatory aspects.
- CO2 Learners will understand analytical aspects of industrial products
- CO3 Learners will gain knowledge about various methods used for drug discovery.
- CO4 Learners will be able to use this knowledge to enhance his employability

### **Course (Paper) Name and No.: Advances in Biotechnology**

- CO1 Biopharmaceuticals with respect to structure large scale production and its application
- CO2 The details of intellectual property rights, its need and forms as well as bioethical issues
- CO3 Extreme environmental condition in ocean and microbial diversity as well as marine

bio prospecting

CO4 Methods of synthesis, manipulation and expression of genes

CO5 Protein engineering and synthetic biology

**Course (Paper) Name and No.: Applied & Environment Monitoring & Management**

CO1 The learners will be able to understand the process of bioremediation, biodegradation and waste management which a need of today's society.

CO2 The learners will acquire the knowledge of biofilm formation and its control.

CO3 The learners will understand the cause of pollution and develop skills to detect various pollutants.

CO4 The learners will understand the concept of biosafety and solid waste management

# 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, biostatistical 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 pandemic 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

## **Class: M.Sc. I Biotechnology**

### **Semester I**

#### **Course (Paper) Name and No.: Biochemistry Paper-I**

- CO1 Students will gain fundamental knowledge in biochemistry.
- CO2 Students will understand the molecular basis of various pathological conditions from the perspective of biochemical reactions.
- CO3 Students will develop a deep understanding of concepts like glycosylation, folding and degradation of proteins, regulation of metabolic pathways, cell structure, cell division and molecular basis of various cellular processes
- CO4 Students will learn chemistry of nucleic acids with regulation of metabolic pathways.

#### **Course (Paper) Name and No.: Immunology Paper-II**

- CO1 Students will gain education in Immunology, molecular Diagnostics and developmental biology
- CO2 Students will get an idea of defense mechanism and diagnosis of infectious diseases with essential concepts of differentiation and growth in animals.
- CO3 Evaluate usefulness of immunology in different pharmaceutical company.
- CO4 Students will get the knowledge of different immunological techniques.

#### **Course (Paper) Name and No.: Cell Biology Paper-III**

- CO1 Students will learn signal transduction mechanisms, in particular the concepts of response specificity, signal amplitude & duration, signal integration and intracellular location
- CO2 Students will get knowledge of different types of extracellular signals and receptors, and explain their functional significance
- CO3 The students will be able to learn how genetics contributes to predisposition and progression of cancer.
- CO4 It will help the students to understand how immunotherapy is, and can be, used to treat human illness.

### **Course (Paper)Name and No.: Genomics and Emerging Technologies - Paper-IV**

- CO1 Students will be able to acquire knowledge and understanding of fundamentals of genomics, proteomics, transcriptomics and metabolomics with their applications in various applied areas of biology.
- CO2 Students will be able to learn history, theoretical basis, and basic understanding of latest technologies in area of biotechnology.
- CO3 They will also be able to learn about various applications of emerging techniques used in genomics, proteomics.
- CO4 Students will get knowledge of molecular cytogenetics including advanced fluorescence techniques and CRISPER CAS

### **Class: M.Sc. I Biotechnology**

#### **Semester II**

### **Course (Paper) Name and No.: Bioinformatics and Biostatistics – Paper-I**

- CO1 Students will be acquainted to organization of various databases.
- CO2 Students will be able to analyze, interpret and study biological data (sequence, structure, etc.) stored in various databases available on internet.
- CO3 Biostatistics & Computational Biology will enrich the students how to utilize various tools of biostatics in interpretation of biological data, different sampling methods including probability, correlation and regression.
- CO4 To Gain broad understanding in statistics and approach to problem solving, on a diverse variety of disciplines. To Gain working knowledge of these computational tools and methods.

### **Course (Paper) Name and No.: Plant and Animal Biotechnology –Paper II**

- CO1 Gain basic skills in plant and animal biotechnology.
- CO2 Learn basic technical aspects of plant tissue culture technique like media preparation,

seed sterilization, callus culture and maintenance of aseptic conditions. The skill could be applied in agriculture and crop improvement.

- CO3 Learn to demonstrate foundational knowledge of Cell culture techniques and competence in laboratory technique
- CO4 Students will learn molecular mapping, marker assisted selection and plant genetic manipulations including strategies for introducing biotic and abiotic stress resistance

### **Course (Paper) Name and No.: Bioprocess Engineering and Technology- Paper III**

- CO1 Appreciate relevance of microorganisms from industrial context.
- CO2 Give an account of design and operations of various fermenters.
- CO3 Give an account of important microbial/enzymatic industrial processes in food and fuel industry
- CO4 Students will learn about fermented foods and beverages with knowledge of Food additives and supplements

### **Course (Paper) Name and No.: Intellectual Property Rights & Bioethics–Paper IV**

- CO1 Understand the rationale for and against IPR and especially patents;
- CO2 Understand why India has adopted an IPR Policy and be familiar with broad outline of patent regulations;
- CO3 Gain knowledge of biosafety and risk assessment of products derived from recombinant DNA research and environmental release of genetically modified organisms, national and international regulations
- CO4 Students will become familiar with ethical issues in biological research.

**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).

# 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

## Course Outcomes

### Class: M.Sc. I (Computer Science)

#### Semester I

#### Course (Paper) Name and No.: P-I, Analysis of Algorithms and Researching Computing

- CO1 Understand the concepts of different algorithm techniques like maximum subarray problem, randomized algorithm.
- CO2 Implement the Graph, Tree representation.
- CO3 Implement elementary number notations, overview of research process and elementary graph algorithms.
- CO4 Understand the quantitative data analysis concepts.
- CO5 Learn about the research area, its importance, ethics and need to the society.
- CO6 Implement dynamic programming algorithms.

#### Course (Paper) Name and No.: P-II, Advanced Networking Concepts

- CO1 Learner will be able to understand the concepts of Advanced networking, which are important for them to be known as a '*networking professionals*'
- CO2 Useful to proceed with industrial requirements and International vendor certifications
- CO3 Learner will be able to understand the concepts of wireless networks and Adhoc networks
- CO4 Learners understands the working of Wireless Sensor Networks

#### Course (Paper) Name and No.: P III, Advanced Database Systems

- CO1 Understood the architecture, design, features of distributed systems.
- CO2 Understood how transactions processing occurs in distributed and parallel systems.
- CO3 Understood object oriented, temporal, spatial databases in detail.
- CO4 Understood concepts of deductive, active, multimedia, XML dB in detail

## **Course (Paper) Name and No.: P-IV, Robotics and Artificial Intelligence**

- CO1 Apply and evaluate concepts of gear, sensors and motors
- CO2 Apply and evaluate the concepts of vision, feedback control and trajectory planning
- CO3 Plan, design and implement robotics systems and algorithms.
- CO4 Analyse and formalize the problem as a state space, graph and select amongst different search

## **Semester II**

### **Course (Paper) Name and No.: P-I, Advanced Operating system**

- CO1 Students demonstrate an ability to analyse a problem and identify and define the computing requirements appropriate to its solution.
- CO2 Students demonstrate an ability to design, implement process and components for distributing systems.
- CO3 Students demonstrate an ability to evaluate a computer-based system or program to meet desired needs.
- CO4 Develop and master understanding of algorithms used by operating systems for various purposes.

### **Course (Paper) Name and No.: P-II Design and Implementation of Modern Compiler**

- CO1 Students demonstrate an ability to analyse phases of compilation processes.
- CO2 Students demonstrate an ability to implement a compiler for a small programming language.
- CO3 Learns the optimization techniques
- CO4 Learns dataflow analysis

### **Course (Paper) Name and No.: Elective I - Track A Cloud Computing-I**

- CO1 To develop application using cloud computing environments
- CO2 To present a survey on cloud building blocks and technologies
- CO3 To perform cloud computing admin and programming using open source tools
- CO4 Identify the issues of cloud computing such as security, privacy, and interoperability

### **Course (Paper) Name and No.: Elective I-Track B: Cyber and Information Security (Network and Communication Security)**

- CO1 Understand a variety of generic security threats and vulnerabilities
- CO2 Learn data recovery techniques and protocols
- 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 practicals

### **Course (Paper) Name and No.: Elective II - Track C: Business Intelligence and Big Data Analytics (Business Intelligence)**

- CO1 Create Data cubes in Sql Server .
- CO2 Apply star schema, snowflake schema, parent child schema in the application.
- CO3 Perform operations like drill down, roll up on the data cube.
- CO4 Apply association rule in real life examples

### **Course (Paper) Name and No.: Elective II- Track D: Machine Intelligence**

- CO1 Gain knowledge about basic concepts of Machine Learning
- CO2 Identify machine learning techniques suitable for a given problem
- CO3 Generate optimized models using various machine learning techniques
- CO4 Apply Dimensionality reduction techniques for attribute reduction

## **Class: M.Sc. II (Computer Science)**

### **Semester III**

#### **Course (Paper) Name and No.: P-I, Ubiquitous Computing**

- CO1 Describe the characteristics of pervasive computing applications including the basic
- CO2 Computing application problems, performance objectives and quality of services, major system components and architectures of the systems.
- CO3 Analyze the strengths, problems and limitations of the current tools, devices and
- CO4 Communications for pervasive computing systems.
- CO5 Recognize the different ways that humans will interact with systems in a ubiquitous environment and account for these accordingly.
- CO6 List and exemplify the key technologies involved in the development of Ubicomp systems.

#### **Course (Paper) Name and No.: P-II, Social Network Analysis**

- CO1 Analyze the area of social network concepts, relationship analysis and relationships using algorithm.
- CO2 Apprehend how network analysis can contribute to increasing knowledge about diverse aspects of society using local and global centrality, Approaches and google page rank algorithm.
- CO3 Use a relational algorithm like Dijkstra's algorithm using top-down and bottom up approaches.
- CO4 Analyze social network data using various software packages and similarity and structural equivalences.
- CO5 Ascertaining mode networks, Bi-partite data structure and SVD analysis.
- CO6 Compare different Similarity and dissimilarity distance measuring approaches

### **Course (Paper) Name and No.: Elective I- Track A: Cloud Computing -II**

- CO1 Learners will be able to define Cloud Computing and memorize the different Cloud service and deployment models. Learners can analyse and describe importance of virtualization along with their technologies.
- CO2 Learners will be able to identify different cloud computing platforms.
- CO3 Learners will get sound knowledge of cloud technologies and how to use them.
- CO4 Learners will learn the variety of Software Architecture models for cloud computing and develop working experience in several of them.

### **Course (Paper) Name and No.: Elective I- Track B: Cyber and Information Security II**

- CO1 Understand the definition of computer forensics fundamentals.
- CO2 Describe the types of computer forensic technology.
- CO3 Learn Mobile Forensics and its tools to analyze mobile data
- CO4 Illustrate the methods for data recovery, evidence collection and data seizure
- CO5 Summarize duplication and preservation of digital evidence

### **Course (Paper) Name and No.: Elective II- Track C: Business Intelligence and Big Data Analytics –II (Mining Massive Data sets)**

- CO1 To optimize business decisions and create competitive advantage with Big Data analytics
- CO2 To learn to use various algorithms of map reduce.
- CO3 To understand the various search methods and visualization techniques, Methods for high degrees of similarity.
- CO4 To learn data mining streams and its architecture.

### **Course (Paper) Name and No.: Elective II - Track D, Machine Learning –II**

- CO1 Gain knowledge about advance concepts of Machine Learning
- CO2 Identify probability distribution techniques suitable for a given problem
- CO3 Design of applications using various graphical models
- CO4 Understand the strengths and weaknesses of different Machine Learning approaches

## **Semester IV**

### **Course (Paper) Name and No.: P-I, Simulation and Modelling**

- CO1 Students should be able to understand the concepts related to simulation and conceptual modelling.
- CO2 Students should be able to understand conceptual and simulation models verification and validation.
- CO3 Students can understand different methods for simulation modelling.
- CO4 Students can understand how designing of models is done and how models behave in different external environments

### **Course (Paper) Name and No.: Elective I Track B: Cyber and Information Security-II (Cryptography and Crypt Analysis)**

- CO1 Understand the significance of cryptography to the modern world and the internet.
- CO2 Solve elementary problems in number theory relating to cryptography.
- CO3 Build on number theoretic basics to further their knowledge of advanced methods of cryptography.
- CO4 Understand the computer security including network security and cryptography. Integrate cryptographic algorithms into software projects.

**Course (Paper) Name and No.: Elective II Track C: Business Intelligence and Big Data Analytics-III (Intelligent Data Analysis)**

- CO1 Implement clustering algorithms like k-means, partitioning algorithms.
- CO2 Explore the concepts of Bayesian classification, Document classification, Bayesian Networks on real data.
- CO3 Implement Principal Component Analysis and decomposition techniques.
- CO4 Implement the concept of Collaborative Filtering, Dimensionality Reduction, link analysis
- CO5 Explore the concept of Recommendation System

# 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.

## Course Outcomes

### Class: M.Sc. I Information Technology

#### Semester I

#### Course (Paper) Name and No.: P-I, Research in Computing

- CO1 Learners will be able to describe real world problems with scientific approach
- CO2 Learners will be able to define analytical skills by applying scientific methods.
- CO3 Learners will be able to recognize and apply the language, theory and models of the field of business analytics.
- CO4 Learners will be able to focus on ability to critically analyze, synthesize and solve complex unstructured business problems
- CO5 Learners will be able to define and critically apply the concepts and methods of business analytics.

#### Course (Paper) Name and No.: P-II, Data Science

- CO1 Learners will be able to distinguish and correlate ethical issues in business related to intellectual property, data security, integrity, and privacy.
- CO2 Learners will be able to develop ethical practices in everyday business activities and make well-reasoned ethical business and data management decisions.
- CO3 Learners will be able to demonstrate knowledge of statistical data analysis techniques utilized in business decision making.
- CO4 Learners will be able to apply principles of Data Science to the analysis of business problems.
- CO5 Learners will be able to evaluate the use of teamwork, leadership skills, decision making and organization theory.

### **Course (Paper) Name and No.: P III, Cloud Computing**

- CO1 Learners will be able to analyze the Cloud computing setup with its vulnerabilities and applications using different architectures.
- CO2 Learners will be able to design different workflows according to requirements and apply map reduce programming model.
- CO3 Learners will be able to apply and design suitable Virtualization concepts, Cloud Resource Management and design scheduling algorithms.
- CO4 Learners will be able to create combinatorial auctions for cloud resources and design scheduling algorithms for computing clouds.
- CO5 Learners will be able to assess cloud Storage systems and Cloud security, the risks involved, its impact and develop cloud application.

### **Course (Paper) Name and No.: P-IV, Soft Computing Techniques**

- CO1 Learners will be able to identify and describe soft computing techniques and their roles in building intelligent machines.
- CO2 Learners will be able to recognize the feasibility of establishing a soft computing methodology for a particular problem.
- CO3 Learners will be able to apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems.
- CO4 Learners will be able to operate genetic algorithms to combinatorial optimization problems.
- CO5 Learners will be able to evaluate and compare solutions by various soft computing approaches for a given problem.

## Semester II

### Course (Paper) Name and No.: P-I, Big Data Analytics

- CO1 Learners will be able to identify the key issues in big data management and its associated applications in intelligent business and scientific computing.
- CO2 Learners will be able to compute fundamental enabling techniques and scalable algorithms like Hadoop, Map Reduce and NO SQL in big data analytics.
- CO3 Learners will be able to determine business models and scientific computing paradigms, and apply software tools for big data analytics.
- CO4 Learners will be able to adapt adequate perspectives of big data analytics in various applications like recommender systems, social media applications etc.

### Course (Paper) Name and No.: P-II Modern Networking

- CO1 Learners will be able to define and describe in-depth knowledge in the area of Computer Networking.
- CO2 Learners will be able to examine scholarship of knowledge through performing in a group to identify, formulate and solve a problem related to Computer Networks.
- CO3 Learners will be able to prepare a technical document for the identified Networking System Conducting experiments.
- CO4 Learners will be able to analyze the identified research work in building Computer Networks.

### Course (Paper) Name and No.: P-III Cloud Computing and Ubiquitous System

- CO1 Learners will be able to develop web applications using Model View Control. Create MVC Models and write code that implements business logic within Model methods, properties, and events
- CO2 Learners will be able to create views in an MVC application that display and edit data and interact with Models and Controllers

- CO3 Learners will be able to discover the philosophy and architecture of .NET.
- CO4 Learners will be able to describe core packages, .net packages and frameworks.
- CO5 Learners will be able to develop a working knowledge of the .NET programming model.

**Course (Paper) Name and No.: P-IV Image Processing**

- CO1 Learners will be able to describe the relevant aspects of digital image representation and their practical implications.
- CO2 Learners will be able to design point wise intensity transformations to meet stated specifications
- CO3 Learners will be able to discover 2-D convolution, the 2-D DFT, and have the ability to design systems using these concepts
- CO4 Learners will be able to express a command of basic image restoration techniques
- CO5 Learners will be able to generalize the role of alternative color spaces, and the design requirements leading to choices of color space

## **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 Learn 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.

# Foundation Course

# Department of Foundation Course

## Course Outcomes

**Class: F.Y. B.A./B.Com./B.Sc./ B.Com. (A&F)/ BMS/Biotechnology**

### Semester I

#### **Course (Paper) Name and No.: Foundation Course- I**

- CO1 To know about duties & responsibilities towards society
- CO2 To aware about the socio-economic problems and diversified issues of society.
- CO3 To impart knowledge of Globalization and make students aware about the problems in society.
- CO4 To create awareness about the fundamental rights according to Indian Constitution
- CO5 To study key Aspect of political Process

### Semester II

#### **Course (Paper) Name and No.: Foundation Course- II**

- CO1 The learners would be acquainted with the sectors of the Indian Economy and its basic facets.
- CO2 To help learners grasp the idea of Fundamental Rights and Duties according to Indian Constitution.
- CO3 This will inspire learners to understand and take care of our Mother Earth.
- CO4 This will aid to identify the problems within humans in the contemporary society and ways to deal with it.
- CO5 The learners will learn how to cope up with stress and deal with conflicts.

## **Class: S.Y. B.A./ B.Com./ B.Sc.**

### **Semester III**

#### **Course (Paper) Name and No.: Foundation Course- III**

- CO1 Student will able to understand about Right of SC, ST, Women, children,& people with disabilities.
- CO2 Learners will able to understand about Environmental disaster
- CO3 To understand about various Science & technology and their uses
- CO4 Student will able to understand about verbal & non verbal communication, presentation skills.

### **Semester IV**

#### **Course (Paper) Name and No.: Foundation Course- IV**

- CO1 Student will able to understand consumer rights, right to information , protection of citizens and public service guarantee Act.
- CO2 Learners will understand importance of ecology and various sustainable principle, poultry principle pay principle.
- CO3 To understand application of various modern technologies.
- CO4 Students will understand financial basic information on competitive examination, its pattern, eligibility criteria and local centres and soft skill required for such exam.

# Department of Foundation Course in NCC Studies

## Course Outcomes

Class: F.Y. B.A. / B.Com. / B.Sc.

### Semester I

#### Course (Paper) Name and No.: Foundation Course in NCC Studies- I

- CO1 The students will display sense of patriotism, secular values and shall be transformed into motivated youth who will contribute towards nation building through national unity and social cohesion.
- CO2 The students will demonstrate the sense of discipline, improve bearing, smartness, turn out, and develop the quality of immediate and implicit obedience of orders, with good reflexes.
- CO3 The student will be aware of the conservation of natural resources and protection of environment.
- CO4 The student will develop an all-round personality with adequate leadership traits to deal / contribute effectively in life.
- CO5 The training shall instill patriotism, commitment and passion to serve the nation motivating the youth to join the defence forces

### Semester II

#### Course (Paper) Name and No.: Foundation Course in NCC Studies - II

- CO1 The learners shall gain basic information about civil defense organization and shall assist them in various types of emergencies during Natural calamities.
- CO2 The learners have an understanding about social needs and participate in community action programmes.
- CO3 The learners will overcome fear; inculcate within them the sense of adventure.
- CO4 The learners will be disciplined, smart and develop obedience.

CO5 It will develop skill of handling weapons and will benefit them to pursue defense carrier.

CO6 The learners shall instill patriotism, commitment, and passion to join defense forces.

## **Class: S.Y. B.A./ B.Com./ B.Sc.**

### **Semester III**

#### **Course (Paper) Name and No.: Foundation Course in NCC Studies - III**

- CO1 The learners will display sense of patriotism, secular values and shall be transformed into motivated youth who will contribute towards nation.
- CO2 Learners will gain basic information about various career opportunities in Defense forces.
- CO3 Learners will be trained for SSB examination preparation.
- CO4 The learners will inculcate officer like qualities with desired ability to take right decisions.
- CO5 Learners will be acquainted with basic knowledge of handling and training of weapons.

### **Semester IV**

#### **Course (Paper) Name and No.: Foundation Course in NCC Studies - IV**

- CO1 The learners will gain basic information about civil defense organization.
- CO2 The learners will have understanding of social aspects and will voluntarily participate in social activities.
- CO3 The learners will be aware of personal health and hygiene.
- CO4 The learners will have basic knowledge of weapon training.
- CO5 The learners will be disciplined, improve bearing, smartness, and develop the quality of immediate and implicit obedience of orders, with good reflexes.
- CO6 The training of NCC will instill patriotism; commitment and passion to serve the nation and motivate the youths to join the defense forces.

# Department of Foundation Course in NSS Studies

## Course Outcomes

**Class: F.Y. B.A./ B.Com./ B.Sc./ B.Com. (A&F)/ BMS**

### Semester I

#### **Course (Paper) Name and No.: Foundation Course in NSS- I**

- CO1 It will enable students to get acquainted completely about the organisation.
- CO2 It will aid in cultivating sense of responsibility.
- CO3 This will facilitate to question the roots of the contemporary problems and search for its solution.
- CO4 This will aid in connecting the dots between justice and development and our constitution.

### Semester II

#### **Course (Paper) Name and No.: Foundation Course in NSS - II**

- CO1 It will help the students to understand their role and built up qualities for planning.
- CO2 It will aid in cultivating the skills for taking survey and comprehend the organization in planning process.
- CO3 This will facilitate students to understand the nature of camping
- CO4 This will help in developing the sense of appreciation of the working and nitty-gritty of the GOs, NGOs and VOs.

**Class: S.Y. B.A./ B.Com./ B.Sc.**

### **Semester III**

**Course (Paper) Name and No.: Foundation Course in NSS - III**

- CO1 It will help the students to understand various facets of core Values, Gender and Empowerment.
- CO2 It will aid in cultivating the skills for Disaster preparedness.
- CO3 This will facilitate students to understand and work on their and community's Health and Hygiene.
- CO4 This will help in developing the sense of responsibility towards Environment and its conservation

### **Semester IV**

**Course (Paper) Name and No.: Foundation Course in NSS - IV**

- CO1 It will enable students to get acquainted completely about the skills required for self-employment.
- CO2 It will aid in cultivating sense of responsibility towards Khadi and its allied sectors.
- CO3 This will help students to grasp and look upon the inspiration of ideal villages.
- CO4 This will inspire to think and know earnestly about the NGOs and GOs.

# Department of Foundation Course in Physical Education

## Course Outcomes

**Class: F.Y. B.A./ B.Com./ B.Sc./ BMS/ B.Com. (A&F)/ Biotechnology**

### Semester I

#### **Course (Paper) Name and No.: Foundation Course in Physical Education- I**

- CO1 They become knowledgeable about importance of physical fitness and also fitness components
- CO2 Receive the knowledge of measuring the different fitness components.
- CO3 They understand the effects of regular exercise on different body systems & take care accordingly.
- CO4 The students became aware of working of internal body systems.
- CO5 They know the rules and fundamental skills of two Indian games Table Tennis and Badminton

### Semester II

#### **Course (Paper) Name and No.: Foundation Course in Physical Education- II**

- CO1 By knowledge benefits of fitness they go regularly to college gym and practice exercise to develop fitness.
- CO2 Due to received knowledge of communicable disease they are able to apply it and take care of it
- CO3 The students achieve the knowledge of principles of ashtang yoga & according they try to apply it in day today.
- CO4 Became aware of managing the problems of obesity life.
- CO5 They became able to play Volleyball, Handball & Football by using Fundamental skill.

**Class: S.Y. B.A./ B.Com./ B.Sc./ BMS/ B.Com. (A&F)/ Biotechnology**

### **Semester III**

#### **Course (Paper) Name and No.: Foundation Course in Physical Education- III**

- CO1 Students acquire the knowledge of health and apply the parameters to check the health status.
- CO2 They know the principles of nutrition, dietary guidelines and also implement the same for the purpose of improvements.
- CO3 They became able to implements the preventive measures and take care of sports injuries & also helps other people.
- CO4 They know the importance of sports Training and accordingly apply it in their own practice sessions also they avoid using drugs for performance by knowing other bad effects

### **Semester IV**

#### **Course (Paper) Name and No.: Foundation Course in Physical Education- IV**

- CO1 Due to the knowledge of rules & scheme of awards of sports from beginning they became aware of it.
- CO2 They apply the ways & means to avoid stressful situations.
- CO3 They apply the yogic exercises to improve performance & concentration in their personal games & work.
- CO4 They are able to apply the good strategies of healthy life style.

# **B.C.Thakur Centre for Skill Development**

# Programme- Fashion Designing

## Programme Outcomes

- PO1 To provide in-depth knowledge of scientific and technological aspects
- PO2 To familiarize with current and recent development in fashion
- PO3 To enrich knowledge through programmes such as industrial visits, projects etc
- PO4 To train students in skill related to fashion for academic and industrial requirement
- PO5 To develop analytical abilities for independent thinking
- PO6 To help students build-up a progressive and successful career in fashion

## Course Outcomes

### Class: First Year Diploma in Fashion Designing

#### Course (Paper) : Apparel study –Designing Paper 1

- CO1 Students have different ideas of fashion , they understand fashion is around them
- CO2 Students understands Basic elements and basic principles of fashion.
- CO3 Learning variations of details like sleeve, collars, skirts n other things make them aware of the different methods
- CO4 Basic knowledge tells them or makes them aware of how our Indian as well as international fashion designers work for a theme.
- CO5 Designers make us feel that the elements or the things they have used in their collection are from different feel, in reality they have the same base which we learn.
- CO6 How to master your skills and use your ideas effectively in your collection. Tells us how much you have known or studied the subject

#### Course (Paper) : Pattern Making & Garment Construction Paper 2

- CO1 Students can able to stitch different types of stitches can sell and do exhibition
- CO2 Students learn to stitch also trained to do freelance work
- CO3 Students trained to work in industry and make them independent to earn
- CO4 Students can stitch daily products like bags,clutches,scarfs, informal dresses,child dresses and sold it

#### Course (Paper) : Art Foundation- Paper 3

- CO1 Can do new creation eg. ,can express their ideas in pictorial forms, create different pattern design at boutique or for freelancing for client
- CO2 Students understand the colour combination in fashion collection for better outcome
- CO3 Student understand the development process With the different elements like line shape and colour and apply in their costume designing

- CO4 Understand and apply elements of design in their fashion costume
- CO5 Used knowledge of colouring to paint on garments, did freelance work

### **Course (Paper) : Surface ornamentation (Textile study) -Paper IV**

- CO1 To understand the importance of textile and application in fashion industry
- CO2 Students practice prints eg. bandhani batik, madhubani, kalamkari. And can earn by freelancing
- CO3 Student understand the learn basic study of yarn and can use it in their design collection
- CO4 To get knowledge of Fabric fall, fabric quality, to improve selection designing skills
- CO5 Did sale of bandhani and batik fabric ,also made different accessory products for sell , made mirror work on products and sold

### **Course (Paper): Art appreciation- Indian Art and Costume- Paper V**

- CO1 Students learn about the ancient era, and learn to see it from the fashion point of view.
- CO2 To understand How each era changed the clothing, draping style among every individual
- CO3 Students understand the Clothing changed not only for royal families but also for normal people living there
- CO4 Student get knowledge of History in Mughal n British time totally changed the idea of fashion still people follow the same fashion in traditional and western fashion.
- CO5 New era based on the olden period and the evolution or the changes we do are also shown in todays film industry
- CO6 Student design different fancy outfits for annual days for also for different events and did freelance work

## **Class: Second Year Diploma in Fashion Designing**

### **Course (Paper) : Apparel Study –Designing- Paper 1**

- CO1 Students understand about all different ways of designing including inspiration and non wearable.
- CO2 Most of the study about field and all the functions taken care . At the work place been taught to them
- CO3 Students learn to give presentation on the topic given to them.
- CO4 Learning history all around the world and also the international designers with trend ,brands and collections bring great inspiration in students creativity
- CO5 Fashion show makes them ready for the field to work independently. Also learnn designing and how to handle a client which is the most imp aspect in fashion.
- CO6 Initiate the Startup, stylist, Designer,

### **Course (Paper) : Apparel Study – Merchandising- Paper 1**

- CO1 Students understand about how bulk production is to be taken stating with sampling
- CO2 Most of the study about field and all the functions taken care at the work place been taught to them
- CO3 To understand how to Make everything ready for the collection, new theme, new season collection
- CO4 Preparing purchase order, fabric consumption, fabric saving during bulk production
- CO5 To understand Making collection giving full displaying the product according to the theme
- CO6 Work as Merchandiser in industries

### **Course (Paper) : Pattern Making & Garment Construction-Paper 2**

- CO1 Students understand Students can design and stitch different types of collections and earn with freelance work

- CO2 To Understand the impact of professional fashion solution in societal and environmental contexts and demonstrate the knowledge .
- CO3 Students understand to choose theme and do market research for fabric and accessories, make n patterns design and stitch accordingly
- CO4 Work as freelancers, own Boutique, Designers in industry

### **Course (Paper) Name and No.: Fashion Illustration- Paper 3**

- CO1 Students get knowledge and draw fashion Croque
- CO2 Get practice of human body drawing and colouring
- CO3 Students understand to do Mood board according to design collection, team work effectively as an individual and a member or leader in diverse teams
- CO4 Get knowledge of colouring ,drawings and illustration
- CO5 Doing job as a fashion illustrator at fashion Industries

### **Course (Paper) : Surface Ornamentation- Paper 4**

- CO1 Student practice study of Indian embroidery styles that vary by region and clothing styles.
- CO2 Student get knowledge of fabric painting and can earn by freelancing
- CO3 Student worked Indian embroidery on blouse and sarees
- CO4 Student did freelance work ,and customized orders of surface ornamentation

### **Course (Paper) : Design collection / Portfolio Development**

- CO1 Student learn to organise fashion show and display design collection.
- CO2 Student do portfolio Display the academic work to get job in fashion industry
- CO3 Got job in industry, University ,stylist in film ,stylist for film actors ,start their own boutique , freelancing
- CO4 Student learn styling ,accessories, time management skill, backstage management

# Programme- Diploma in Interior Designing (SNDT)

## Programme Outcomes

- PO1 Global demand and supply of building material such as Timber , Metals, Paint, Glass Etc. and come to know how to preserve and utilize of each type of materials.
- PO2 The construction techniques and principles will also help to formulate practical ideas while designing.
- PO3 Drawing parallel and angular perspective with different position of picture plan of bed rm./ living rm.
- PO4 Will improve presentation skills among students.
- PO5 Develop skills of planning of Residential spaces with clear understanding and application of functionality.
- PO6 Gain knowledge of advance interior designing services like acoustic, ventilation, Water supply, Water proofing, electrical systems Etc.
- PO7 Professional practice subject develop skills to face wide range of challenges that they may encounter as professional planners.
- PO8 Working Drawing subject provides technical base for execution of designer's Ideas.
- PO9 Develop skills of planning of Commercial spaces with clear understanding and application of functionality.

## Course Outcomes

### Class: First Year Diploma in Interior Designing

#### Course (Paper) Name and No.: Theory of Materials

- CO1 Explain classification , Properties, good qualities of stone. Methods of dressing, Application and uses in interior projects.
- CO2 Explain types of clay products, & of bricks. Define good quality of clay products, & bricks. So understand the quality of products while doing practice.
- CO3 Explain classification, Properties, good qualities of Timber. Methods of preservation, Application and uses in interior projects. List out market and industrial form of wood product.
- CO4 Define Properties, application and uses, methods of preserving of all civil construction material – Lime, Cement, plaster, mortar, concrete.
- CO5 Define types, Properties, application and uses, methods of preserving of paint. In actual working understand the process even quality of paint.

#### Course (Paper) Name and No.: Construction

- CO1 Sign and symbols of different construction materials for drawing purpose.
- CO2 Sizes and types of bricks with freehand sketches. Different types of brick bonds –draw plan, elevation, and isometric view.
- CO3 Show types of arches /carpentry joinery with their dimensions and terminology.
- CO4 Draw different types of panel doors/Windows with the terminology.
- CO5 Draw Different types of staircases – plan, elevation, and detail joinery with terminology.
- CO6 Draw different types of Mezzanine floors with their plan, sections, dimensions and isometric view.

### **Course (Paper) Name and No.: Perspective/Rendering**

- CO1 Learn to draw gradation of lines with different medium. (Freehandwith t, set squares.
- CO2 Study of metric scales.
- CO3 Draw orthographic projection of cube, cylinder, pyramid and other shapes/ furniture.
- CO4 Draw 3 dimension views and finish with textures, colors, sciography.
- CO5 Draw parallel perspective with different position of picture plan of bed rm., living rm.
- CO6 Increased the visualization power.
- CO7 Rendering develop the séance of color combinations.
- CO8 Knowing the proper method of drawing helps the designer to present own ideas in front of client.

### **Course (Paper) Name and No.: Design**

- CO1 Learn basic elements of design through sketching and theory.
- CO2 Learn basic principles of design through sketching and theory. So the upcoming designer can easily develop their designing ability.
- CO3 Learn to take the measuring the structure on site and drafting on paper the same.
- CO4 Learn to know the details of structural elements which are much important in making the structure more beautiful.
- CO5 Define anthropometry data with standard furniture sizes.
- CO6 Human health, comfort, safety in each activity will manage with the help of anthropometry data.
- CO7 Drawing of living room/Master Bed room with attached toilet-plan, elevations& views.
- CO8 Planning of Full flat -plan, elevations, and views with client profile & concept sheet

## **Class: Second Year Diploma in Interior Designing**

### **Course (Paper) Name and No.: Building Services**

- CO1 Explain various types and principles of ventilation/ water supply and drainage.
- CO2 What are the different types and the principles of air conditioning systems or different types of methods for waterproofing systems?
- CO3 What are the components of a window ac, explain with sketches.
- CO4 Explain various types and principles of light. How useful in interiors.
- CO5 Explain single and three phase supply, ELCB, different types of wiring systems.
- CO6 What is sound insulation, the significance of sound absorbent materials?
- CO7 List the defects of sound.8) What is the principles and general methods of thermal insulation.
- CO8 Explain various types of plants and principles of landscaping. How useful in interiors.

### **Course (Paper) Name and No.: Professional Practice**

- CO1 Explain the role of interior designer in the society and highlight responsibilities, liabilities in profession.
- CO2 List out different types of Tenders and explain them.
- CO3 Define term contract and different types of contract.
- CO4 Explain the procedure of executing the interior project.
- CO5 As an interior designer how would he/she contribute to the betterment of the society?
- CO6 Draft a B.O.Q. for a kitchen measuring 100 sq. ft. with L shape platform and overhead.
- CO7 Enlist types and the factors to be considered during preparation of a detailed Estimate.
- CO8 How to quote the own (designer) fees idea

### **Course (Paper) Name and No.: Working Drawing**

- CO1 Draw wardrobe details—sectional plan, elevation, and drawer detail with nomenclature.
- CO2 Draw Double Bed details—sectional plan, elevation, and trolley detail with nomenclature.
- CO3 Show details of double skin paneling which is finished with laminate.
- CO4 Draw 180 cm.x210 cm partition with all details.
- CO5 Draw Bank counter/Reception counter details—sectional plan, elevation, and drawer detail with nomenclature.
- CO6 Draw 300 cm.x210 cm area cover by gypsum ceiling with all details.
- CO7 Show details of Executive table which is finished with veneer, glass and corian.
- CO8 Learn the idea of detailing of the each item of work

### **Course (Paper) Name and No.: Design**

- CO1 Designing small area commercial project—Topics—Fast food centre/Beauty parlor/Coffee café/Mobile shop/ Clinic/Coaching classes/Estate agent office.
- CO2 Designing large area commercial project—Topics—Builders office/ Bank/ Restaurant/ Boutique etc.
- CO3 Alternates of space planning. Final furniture layout with concept sheet.
- CO4 Flooring layout / False ceiling layout/Electrical plan/a. c. layout/ Sectional elevations.
- CO5 All internal as well as external perspective views.
- CO6 Detail drawing of any furniture item will be easily understood during process of manufacturing it.
- CO7 Commercial Designing would be easy after knowing the details of different commercial places
- CO8 Working of Commercial project with all services knows better

### **Course (Paper) Name and No.: AUTOCAD**

- C01 Learn various applications of various types of rendering of the plans, Sections, Elevations, Perspectives using different media.
- C02 2 D drawings with basic tools application and presentation.
- C03 Training of 3 D drawings with rendering, naming.
- C04 Large area project presentation fully with the help of auto cad.

### **Course (Paper) Name and No.: Viva Voce**

- C01 Develop the skills of communication
- C02 Develop the skills of presentation
- C03 Know to answering the questions in front of professionals
- C04 built up the confidence
- C05 Market survey for materials will be easy at the time of actual work



*Janardan Bhagat Shikshan Prasarak Sanstha's*

## **Changu Kana Thakur**

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