Pandit Jawaharlal Nehru Mahavidyalaya, Shivaji Nagar, Aurangabad.

Faculty: Arts

B.A: General

Programme outcome of English Language and Literature

Progaramme Specific Outcomes (SPO)
1) To expose students to a vivid range of writings from all over the world.
2) To strive students to be imaginative, rhetorical and technically proficient to gain a deeper insight.
3) To equip students with knowledge of English as a world language.
4) To make students communicate accurately and precisely in speaking and written aspects.
5) To prepare students achieve command over English and it's linguistic structures.
6) To make students comprehend and recognize different varities of English language.

Programme Learning Outcome (PLO/PO)
1) To develop familiarity with major literary works, genres, period and critical approaches to various literatures.
2) To develop writing skills effectively and creatively.
3) To demonstrate through class discussion to identify major genres of literature and their influence on society.
4) To make Students awere of specific works of major authors such as Shakespeare, Chaucer, Milton etc.
5) To make students read, write and comprehend English acquisition of soft skills.

Course Outline
1) Students acquire Listening, Speaking, Reading and Writing skills through prescribe prose and poetry.
2) Students develop the ability of critical thinking about various literatures.
3) Students understand the various nuances of written and spoken English.
4) Students gain the prose and poetry appreciations skills.
5) Students use the knowledge of research methodology and prepare their research project.
6) Students inculcate the habit of creative writing.

Programme specific outcome

1. Students of commerce will acquire the skills of communication for business purposes.

2. Students of commerce will be able to communicate effectively and clearly to tackle their day to day affairs with the knowledge a language skills.

3. The students acquire the knowledge of correct and accurate grammatical sentences.

4. The students acquire various sounds and proper pronunciation.

5. The students acquire various sounds and communications skills of business for better employment.

6. The students professional outlook will be improved for better performance due to personality development.

Programme outcome

1. To make students read, write and comprehend English language and develop soft skills.
2. The students develop application of soft skills and express in their own views.
3. The students will acquire the skill of making correct and accurate grammatical sentences.
4. The students learn about the various sounds and proper pronunciation of English language.
5. The students develop the skills of business communication to gain employment opportunities.
6. The students will be able to gain confidence with skillfull acquisition of language skills and develop their personality.

Course outcome

1. Students gain the knowledge to apply basic grammatical rules from the prescribe text.
2. Students gain proficiency in English language and their adoptability to the demand of the situation.
3. Students know the fundamentals of effective communication.
4. Students analyze their vocabulary and communication ability for better productivity, job performance, develop self-confidence and personality.

Department of Hindi

Programme outcomes :

P01 : Helps to gain and Enhance the knowledge of Humanity.

P02 : Understands the journey from savage to civilization.

P03 : Understand how cultural, historical geographical, Political, Linguistic,
       and Environmental forces shape the world.

P04 : Demonstrate intercultural awareness and competence.

P05 : Analyze and Criticize the reflection of complex problems
       incorporating multiple Prespectives and innovative thinking.

P06 : Demonstrate the capacity to argue in innovative directions.

P07 : Practice creative thinking and expression.

P08 : Demonstrate detailed knowledge in one or more disciplinary
       boundaries.

P09 : Develop a detailed understanding of the current state of knowledge in
       one or more disciplines

P010 : Promote active citizenship and community engagement.

Programme Specific outcomes :

PS01 : Understand the nature, scope and basic concepts in Hindi.

PS02 : Analyze the relationship among various genres of literature like
        poetry autobiographical novel, drama, story one act play etc.

PS03 : Creates an awareness among the students about economical,
        socio - Political and communal issues.

PS04 : Understand how applied Hindi is important in various sectors of
        society like banks, govt. and semi govt. offices etc.

PS05 : Analiyze various theories like modernism, feminism, realism,
        Romantism etc.

PS 06 : Students will be benefitted from saint poetry. Through Saints, their
         philosophies can be Understood from poetry.

PS07 : Understand the process of literature in Hindi.

PS08 : Develop the creativity and mental set up.

Course outcomes :

C01 : Students will develop their attitude towards humanity.

C02 : It helps to build the capacity to argue in innovative directions.

C03 : To preserve and promote India's Linguistic interest related to Hindi Language and install human values inherent in its literature.

C04 : To foster friendship and understanding between and across Hindi and non – Hindi Speaking people through the learning of Hindi.

C05 : To provide civic and cultural education and to generate interest in the Hindi younger generation.

C06 : Students will get the proper linguistic knowledge to communicate with people around the globe.

C07 : It makes students able to express themselves in Hindi.

C08 : Students get acquainted with the Hindi media like cinema, news, advertisements, radio anchoring etc.

C09 : Helps to build language ability among students.

C010 : Students will motivate themselves through literature in their problem solving and will interpret the world.

Department of Marathi

Programme Outcomes:

PO1 Helps to gain and Enhance the Knowledge of Humanity.

PO2: To understands the Journey from Savage to Civilization.

PO3 To understand how cultural, historical, geographical, political, linguistic, and environmental forces shape the world.

PO4 Demonstrate intercultural awareness and competence.

PO5 : Analyze and criticize the reflection of complex problems incorporating multiple perspectives and innovative thinking.

PO6 : Demonstrate the capacity to argue in innovative directions.

PO7: Practice creative thinking and expression.

PO8 Demonstrate detailed knowledge in one or more disciplines and integrate knowledge and perspectives across disciplinary bound

PO9: Develop a detailed understanding of the current state of knowledge in one or more disciplines

. PO10: Promote active citizenship and community engagement.

Programme Specific Outcomes:

PSO1:To understand the nature, scope, values and basic concepts in Marathi.

PSO2:To analyze the relationship among various genres of literature like poetry, Biography, autobiography, novel, drama, short stories, travel writing, one act play etc.

PSO3:To create an awareness among the students about socio-economic, political, cultural situations through the history of Marathi literature.

PS04:To promote the values through the literature of Mukundraj, Saint Dnyaneshwar, Saint Dnyandev, Saint Tukaram, Saint Eknath, Saint Namdev etc.

PS05:To understand the spiritual and religious aspects from the writers the Saint Janabai, Chokhamela, Karmmela, Gora Kumbhar, Visoba Khechar, Savta Mali etc.

PS06:To develop an interest in Reading-writing skills, critical approach ability.

PS07: To determine and analyze various literary types like, Dalit, Rural, feminist, tribal, folk literature etc.

PSO8:To understand the literary process through literary criticism.

PS09: To understand the literary thoughts of great writers such as Sigmund Fried, Karl Yung, F. C. Prescott, S. T. Coleridge, T. S. Eliot etc.

PSO10:To develop Humanitarian, universal, social commitment approaches towards society.

Course Outcomes:

CO1: To develop overall mental, social, and innovative growth of students.

CO2 : To motivate students to develop reading and writing abilities.

CO3 To get knowledge of our great tradition and culture of Marathi literature.

C04 To appreciate the impact of social situations in the writings.

CO5 To inculcate the social commitment among students.

CO6 Students will motivate themselves through literature in their problem solving and will interpret the world.

C07: To help to create creative writers and innovative scholars.

C08 Supports to create formal and informal writings like Essay, letter, report, news, advertisements etc.

C09: Promotes to create and develop reading culture.

CO10: Helps to develop Elocution, Debate, etc.

Department of Public Administration

Subject Outcomes

- Explain the cross-cultural context of public and private institutions operating in a global environment.
- Manage diversity issues within an organizational framework.
- Identify major issues in today's public and private institutions.
- Demonstrate the integrative knowledge, skills, and ethics necessary for responsible administrative, management and leadership positions.
- Demonstrate the management, legal, ethical, and behavioral skills for effective job performance and career mobility.
- To ready for good citizen.

- The student will be familiar with the mechanisms operating in the major political institutions and agencies for the creation and implementation of public policies.

- The student will be familiar with the social forces that affect the creation of public policies.

- The student will be familiar with the predominant political, economic, and social actors that actively engage in the policymaking process, including expert communities, interest groups, the media, agency bureaucrats, and elected officials.

- The student will be familiar with the dominant ideas presently used in the social sciences for understanding the impetus for the creation of public policy and the means for its successful implementation.

- The student will be able to apply this understanding of the various components of social policy making to effectively introduce new aspects to the existing consideration of a specific area of recent public policy interest.

Department of Political Science

- The Bachelor of Arts in Political Science prepares graduates to understand fundamental concepts in the discipline of Political Science.
- Students working toward teacher certification will demonstrate the ability to apply political science knowledge and methodologies within the classroom setting.
- Students will demonstrate substantive knowledge of concepts and facts relevant to Political Science.

PROGRAMME SPECIFIC OUTCOMES

B.A. F.Y.

❖ **Basic Concepts Of Political Science**

- To acquaint with the theories, approaches, concepts and principles of political theory.

- To understand the various traditional and modern theories of political science.

- To evaluate the theories of origin of the state.

- **Government And Politics Of Maharashtra**

- To understand the evolution, scope and significance of state
- To understand the state political, social, economical, study of the state
- To understand the Importance of Panchayat Raj System
- To learn Political Party System

B.A. S.Y.
❖ **Indian Government And Politics**

- To understand the philosophy of Indian constitutions.

- To identify the causes, impact of British colonial rule.

  To appreciate the fundamental rights and duties and the directive principle of state policy

❖ **International Relations**

- To understand the evolution, scope and significance of international relations and the rise of sovereign state system
- To understand the international political economy.
- To learn about issues of National and International World Scenario
- Understanding the nature and developments in national and international politics

B.A. T.Y.

❖ **Western Political Thinkers:**

- Building overall consciousness regarding national political history, international relations and present Indian and Western political thinkers.
- To have Exposure to modern as well as ancient political history
- Western political theory is back bone of today's world politics
- Political thought shows justice rights, law & other Issues related to governance

B.A. T.Y.

❖ **Political Ideologies**

- Examine and analyze the conditions that create the rise of ideologies.
- Interpret and analyze political ideologies as they apply to modern political problems.
- Apply their knowledge of ideologies to current political issues.

Course outcome

B.A. F.Y.

❖ **Government And Politics Of Maharashtra**
- To understand the study & scope and significance of state
- To understand the study political, social, economical, study of the state
- To understand & learn the Importance of Panchayat Raj System
- To Evaluated Political Party System

B.A. S.Y.

❖ **International Relations**

- To understand the evolution, scope and significance of international relations and the rise of sovereign state system
- To analyze the history of international relational through the causes and phases of colonialism
- To know the impact of First World War and Second World War and its causes and consequences to criticizes the various ideologies which lead to the destruction of world.
- To understand the concept of power, national, regional, global and peace security
- To acquaint with the international organizations and their neighbour nations.
- To identify various issues and challenges towards international relations

B.A. T.Y.

❖ **Western Political Thinkers:**

1. Providing an insight into the dominant features of Ancient Western Political Thought: Ancient Greek political thought with focus on Aristotle and Plato; Roman Political Thought: its contributions with special emphasis on the emergence of Roman law.
2. Examining the features of Medieval Political Thought.
3. Evaluating the Renaissance; political thought of Reformation; and Machiavelli.
4. Critically examining Bodin's contributions to the theory of Sovereignty; Hobbes as the founder of the science of materialist politics; Locke as the founder of Liberalism with focus on his views

on natural rights, property and consent; and Rousseau's views on Freedom and Democracy; Bentham's Utilitarianism; and John Stuart Mill's views on liberty and representative government.

5. Taking an insight into the following: Hegel's views on Civil Society and State; Utopian and Scientific socialism: basic characteristics.

6. Examining the varieties of non-Marxist socialism: Fabianism, Syndicalism, Guild Socialism, and German Revisionism.

❖ **Political Ideologies**
- Examine and analyze the conditions that create the rise of ideologies.
- Interpret and analyze political ideologies as they apply to modern political problems.
- Apply their knowledge of ideologies to current political issues.
- To have current knowledge of today's world political ideologies
- To have knowledge of democracy, nationalism state wise politics

Project Work

- To explain importance of research
- How collects data
- To describe impact of problems on society

Deparment of sociology

Programme Specific Outcomes

1) Core course ensures that through teaching and learning knowledge of sociological concepts and theory imparted.

2) Content at syllabi develop the understanding of social equality, diversity and social issues.

3) Whole exercise is done to make students understand and to think critically about society and social problems.

4) The course intended to develop scientific temper and research qualities among students for the future career.

5) Follow new stream of thoughts and theories of social thinkers

Course Outcomes

1) **Introduction to Sociology**
   - To explain concept of theoretical perspectives in sociology and how they are used in sociological explanations of social behavior
   - Describe origin and the development of sociology in general and development in India in particular
   - Give importance and uses of sociology in present society

2) **Individual and Society**
   - To explain factor of social change and social control
   - To describe concept of social Structure
   - To write concept of conformity and deviance

3) **Introduction to subfield of sociology**
   - To explain factor of anthropology
   - To describe concept of social psychology
   - To write concept of applied sociology

4) **Indian social composition**
   - To describe population factors and impact
   - To explain future of Indian society
   - To give importance of democracy in India

5) **Problem of rural India**
   - To describe problems of rural India

- To explain domestic violence
- To describe education drop out

6) Contemporary urban issues
- To describe concept of urbanization
- To give various types of urban planning
- To explain importance of globalization and urban changes

7) Population in India
- To write on density of population in India
- To describe concept of Indian Population
- To Elaborated population growth and environment

8) Sociology of Development
- To explain problems of poverty and unemployment
- To describe concept of development
- To give importance and impact of Government Schemes in India

9) Sociological Tradition
- To describe theory of sociological thinkers
- To explain French revolution
- To explain scope of industrial revolution

10) Introduction to Research Methodology
- To explain types of Methodology
- To give scope importance of research
- To explain problems of objectivity in research

11) Social Problems in India
- **To give** importance of industrial projects
- **To explain** problems of corruption
- **To describe** various quality of education in India

12) Sociological Theories
- To explain theory of social action, symbolic interaction theory, theory of violence
- To describe of theory of power and authority

13) Social Research Methods
- To describe techniques of investigation
- Use of computer in research
- To describe utility of social research

14) Social disorganization in contemporary India
- To explain concept and cause
- To describe women violence
- To explain terrorism and nakshalism
- To give changing values and culture in India

15) Project Work
- To explain importance of research
- How collects data
- To describe impact of problems on society

Department of Economics

Program Specific Outcomes

At the time of graduation, the students will be able to -

PSO1: To know broad characteristics of Indian Economy and World   Economy

PSO2: To analyze nature and behavior of market, demand and supply in

market

 PSO3: To get acquainted with Policies of Agriculture and Industrial.

PSO4: To know about new Economic reforms like globalization

PSO5: To acquire knowledge of various aspects of Economics, like human development,

human welfare

PSO6: To be familiar with aspects of Economic planning, strategy of planning and

achievements of planning

Course Outcomes

F.Y. B.A.

Semester – I

Micro Economics

Upon completion of the course, the students will be able to-

CO1: Discuss basic concepts of Economics

CO2: Discuss basic aspects of Demand and Supply Theories

CO3: Analyze consumer's behavior

CO4: Discuss basic aspects of consumer's equilibrium

CO5: Analyze and explain market equilibrium

Indian Economy

Upon completion of the course, the students will be able to-

CO1: Discuss broad features of the Indian Economy

CO2: Indentify major issues related to population and population policy

CO3: Define natural resources in India

CO4: Describe nature and types of unemployment and concept of poverty

CO5: Explain new economic reforms and concept of globalization

Price Theory

Upon completion of the course, the students will be able to-

CO1: Discuss concept of Production function

CO2: Analyze cost and Revenue **CO3:**

Classify market in various types CO4:

Evaluate theories of distribution

CO5: Understand meaning and related concepts of factor pricing

Money, Banking and Finance

Upon completion of the course, the students will be able to-

CO1: Explain basic aspect about money

CO2: Evaluate principle of Commercial Banks and Banking Structure in India

CO3: Discuss New Concepts in banking sector

CO4: Discuss functions of Reserve Bank of India

CO5: Define the term money market and capital market

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S.Y. B.A.

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Macro Economic

Upon completion of the course, the students will be able to-

CO1: Discuss basic aspects of macro Economics

CO2: Describe concept of National Income

CO3: Explain theory of money and identify the index number

CO4: Explain theories of employment

CO5: Explain Keynesian theory of employment and Nature of trade cycle

Development of Economics

Upon completion of the course, the students will be able to-

CO1: Discuss concept of economic development and growth

CO2: Analyze theories of Adam Smith and Malthus

CO3: Give factors in development process

CO4: Get aware about Models of Economic Growth

CO5: Explain role of sector approach in Economical Development

Public Finance

Upon completion of the course, the students will be able to-

CO1: Discuss nature, scope and importance of public finance

CO2: Explain Public Revenue

CO3: Comprehend public expenditure

CO4: Describe concept, source, causes and effects and importance of public debt

CO5: Explain meaning, objective and components of Union Budget

Statistical Methods

Upon completion of the course, the students will be able to-

CO1: Analyze collection of data – Primary and Secondary data

CO2: Describe types of series – simple, Discrete and continuous series

CO3: Discuss Arithmetic mean – its merits and demerits, mode and median

CO4: Evaluate Range, mean deviation and standard deviation

CO5: Explain variance and Co-efficient of variation

International Economics

Upon completion of the course, the students will be able to-

CO1: Explain basic concept of international economics

CO2: Describe Gains from trade

CO3: Discuss types of tariffs and quotas

CO4: Evaluate concept and components of balance of payment

CO5: Discuss Demerits and limitations of devaluation

Agriculture Economics

Upon completion of the course, the students will be able

to- **CO1:** Discuss the role and importance of Agriculture

CO2: Describe various technologies used in Agriculture

CO3: Explain Government Agriculture Policies

CO4: Acquire knowledge of Indian agricultural development from last 50 years

History of Economic Thought

Upon completion of the course, the students will be able to-

CO1: Explain concept of Mercantilism

CO2: Sketch out Adam Smith division of labour and theory of value

CO3: Comprehend Tomas R. Malthus – theory of population

CO4: Describe Karl Marks theory of dynamics of social change, theory of surplus value

CO5: Explain concept of aggregate economy and the role of fiscal policy

Research Methodology

Upon completion of the course, the students will be able to-

CO1: Discuss meaning, nature, scope and objectives of social science research

CO2: Describe Facts – features Primary data collection

CO3: Discuss motivating factors of social research **CO4:**

Comprehend meaning and need of research design

Industrial Economics

Upon completion of the course, the students will be able to-

CO1: Discuss importance and role of Industries in Economic and social development

CO2: Know industrial organization, ownership structure

CO3: Analyze location and dispersion of industries

CO4: Explain composition of industrial sector

Indian Economic Thinker

Upon completion of the course, the students will be able to-

CO1 Students know the Economic Thought of Koutilya

CO2 To know Economic Ideas of Indian Economic Thinker

Project work

CO1: Describe Facts – features Primary data collection

CO2: Discuss motivating factors of social research

CO3: Students know the practical work about Project work

Department of History

B.A. History Programme Outcome :

Board of Studies (History) Of Dr Babasaheb Ambedkar Marathwada & History Department faculty has indentified the specific objectives of its undergraduate curriculuim. The following are the learning outcomes that we would like to see each history student graduate with. We are continuously and actively assessing our program to ensure that these outcomes are being met.

- Students shall be able to demonstrate thinking skill by analyzing, synthesizing and evaluating historical information from multiple sources.

- Students will develop the ability to distinguish between fact and fiction while understanding that there is no one historical truth.

- Students will demonstrate their understanding of cause and effect along with their knowledge of the general chronology of the human experience.

- Student will develop an ability to convey verbally their historical knowledge.

- Students will be able to demonstrate a breadth of training across historical time and space.

- Students will be able formulate historical arguments and communicate those arguments in clear and persuasive prose.

- Students will be able to apply, assess and debate the major historicasl schools of thought, methodology and types of sources that historians use to make original arguments.

- Understand the present existing social, political, religious and economic conditions of the people.

- Analyze relationship between the past and the present is lively presented in the history.

- To develop practical skills helipful in the study and understanding of historical events. They draw historical maps, charts, diagrams ete. Prepare historical model, tools etc.

- Develop interest in the study of history and activities relating to history. They :

a. Collect ancient arts, old coins and other historical materials,

b. Visit place of histoeical interests, archaeological sites, museums, and archives,

c. Read historical document, map, chart etc,

d. Play active roles in activities of the historical organizations and associations.

- The study of history helps to impart moral education.

- History installs the feeling of patriotism in the hearts of the Pupils.

- To cultivate historical awareness

- To critically think, read and write about the past.

Course Outcome : B.A. Sem. I & II
   P. No. I. Shivaji & His Times,
   P. No. II. History of Modern Maharashtra
   P. No. III. History of the Marathas
   P. No. IV. Twentienth Century Maharashtra

- Understand the concept of swaraj establied by Chh. Shivaji.
- Understand social and religious background of the 17th century Maharashtra.
- Understand the process of the transfer of the power from chhatrpati to Peshwa.
- Understand social and religious condition in 17th century Maharashtra.
- Anlayse Administrative and Judicial system of Maratha period.
- Understand the political ideas of chhatrapti Shivaji Maharaj.
- Understand socio-religious & Economic condition of 17th century Maharashtra.
- Recognize the process Enlightenment in 19th Century Maharashtra.
- Understand early resistance to Colonial power in Maharashtra.
- Recognize & understand the process of the rise & growth of Nationalism in Maharashtra.
- To understand various Social movements in 20th century Maharashtra.
- To know about the development of Education during the colonial period.
- To understand nature of States & States people movement.

Course Outcome : B.A. Sem.III & IV.
   P. No. V. History of Early India
   P. No. VII. History of India
   P. No. VI. History of Delhi Sultanat
   P. No. VIII. History of Mughal India
- Understand of Delhi Sultanate.
- Analyse Mughal administrtion, Arts & Architecture
- Identefiy cultural synthesis.
- Analyse Medival south India.
- Understand the theory of kingship in Medieval India.
- Analyse the reform of All Udin Khilji , Shershaha Suri & Akbar.
- Analyse the religious policy Of Akbar.
- Describe Prehistory and protohistory.
- Classify urbanisation in the ganggetic Basin.
- Classification of Budhisim and Jainism.
- Acqurie knowledge about Early Tamilakam.
- Identify Early Indian Maps.
- Analyes early human settlements - Palaeolithic, Neolithic age**.**

Course Outcome: B.A. Sem. V & VI

          P. No. IX . Historiography
          P. No. X. History of Indian National Movement
          P. No. XI. History of India (A.D. 1757- A.D.1885)
          P. No. XV- Glimpses of the History of Marathwada
          P. No. XIII. Field of History
          P. No. XII & XVI Project Work :

- To cultivate historical awareness amoung student
- To critically think, read and write about the past**.**
- Produce writtenn work that incorporates considration of the relevant historigraphy along with the theory that inform it.
- Construct orginal historical arguments based on primary source.
- Demonstrate a superior quality of writing both in terms of mechanics and in developing an argument effectively.
- Write articles on historical topics,Writing history and Techniques of historical writing.
- Develop their ability to assess critically historical analysis and argument, past and present.
- Gained an understading of the development of the academic study of history throughout the world since the later eighteenth century (since the Renaissance)
- Gained an awareness of recent and contemporary debates in the theory practice of history writing.
- Gaine insight into how historical arguments have been and are made.
- Identify history as Scientific Discipline.
- Understand nature and scope of archaeology
- Understand the importance of musseum in the study of history.
- Encourage widespread participation in archaeology through society, indentifying and addressing barries to inclusivity.
- Understanding of technique and methods of presentation in history by the students,
- Prepration of prelimary bibliography,
- Identify Collection of Datta.
- Presentation of finding, drafting the dissertation
- Understand Historical metthod of research.
- Increase intrest in historical research through project work.
- Evaluate conolidation of English power in India.
- Analyese social, religious consciousness in India.
- Comparison of National movements - pre Gandhian and post- Gandhian Era.
- Indintify Modern Indian Maps- sites of mutiny of 1857, Priencly states in 1858, major site of National congress session, major sites in Civil Disobedience Movement--Ahmadabad, Dandi, Midnapur, Peshwar.
- Understand the process of Indian constitutional development.
- Analyse Democratic Culture in India
- Describe rise of modern world
- Classify growth of Capitalism.
- Analyse development of Democracy.
- Acquire knowledge about 20th century world
- Indentify world map- Oceanic Exploration, Europe in 1815, importantstages of world war, and Important centres of International trade.
- To Understand ancient history of Marathwada,
- Gain information about Trade & Trades route in Ancient Marathwada,
- To Understand Medieval History of Devgiris Yadava,
- Understand the process of the establishment of Hyderabad state,

- Understand the feudalistic Nature of Nizam State.
- Understand the process of Intigration of state in Indian Union.
- Gain information about Arts & Architecture in ancient Marathwada.
- Analyse Culture trasmision in Marathwada.

Faculty: Commerce

B.Com: General

B. Com F. Y./S.Y./T.Y.

Programme Specific Outcome

Outcomes of Commerce

B. Com F. Y.

1) **IT Application in Business**

   CO1: The Basic objective of this paper is to familiarize the student with basic concepts of the computers and hands on practice of the various operating system commands.

2) **Entrepreneurship Development**

   CO1: The object of this paper isto provides the entrepreneurial knowledge to students for entrepreneurship development.

3) **Business & Industrial Economics**

   CO1: The objective of this course is to acquaint the students with the knowledge of Business and industrial economics.

   B. Math & Statistics

   CO1: The objective of this course is to impart knowledge so that students improve their logical reasoning ability and interpretation of various statically results and understand Mathematical calculations.

4) **Financial Accounting**

   CO1: The Course aims at acquainting the students with the emerging issues in business, trade and commerce regarding recording, maintaining and presenting the accounting and financial facts.

B. Com. S. Y.

1) **T. Application in Business**

   CO1: This course objective is to familiarize the students of computer application in various practices for their updating knowledge.

2) **Principals of Business Management**

   CO1: The course objective is to provide Knowledge of management to the student for increasing their qualities & skills.

3) **Corporate Accounting**

   CO1: The course aims is to acquaint the students' knowledge of company Account. For upgrading recording, maintaining& presenting of financial facts.

4) **Business regulatory frame work**

   CO1: To improve the knowledge of student about the Indian contract act & consumer protection act. (Act. 2012) & some of the other laws.

5) **Marketing management**

   CO1: To provide the marketing knowledge to student for their skill & knowledge development about new era of marketing management.

B. Com. T. Y.

1) **Adv. Finance A/C**

   CO1: The object of this course is to equip the students with the ability to analyze, interpreted and uses financial accounts in Business enterprise.

2) **Management Account**

   CO1: This course is to equip the students with the ability to analyze and interpret accounting information in managerial decision making.

   CO2: The student is expected to have a good working knowledge of the subject and application of management accounting technique.

3) **Cost A/C**

   CO1: Expose the student to the basic concept and the tools used in cost Accounting in processing & unit costing.

4) **Indirect Taxes Direct Taxes**

   CO1: this course exposes the student to the basic Tax concept, procedure and legislation pertaining to Indirect Tax.

5) **New Auditing Trends**

   CO1: the study of various components of this course will enable the student to know about the Auditing procedure.

6) **Banking & Insurance**

   CO1: To familiarize student with Banking and practice of Banking.

   CO2: To equip the student with the knowledge of modern Banking.

   CO3: To Develop employability of student in Banking, financial and other economic sector.

Department of Botany

Programme Specific Outcomes

At the time of graduation, the students will be able to-

PSO1: Understand the basic concepts of taxonomy and ecology

PSO2: Acquire knowledge about economics and medicinal plants in agriculture and medicine

PSO3: Analyse the relationship between plants and microbes

PSO4: Understand the biology of diversity of seed plants or phanerogams

PSO5: Understand behaviors of fossils and gymnosperm plants

PSO6: Understand plant diseases, chemical properties and evolutionary relationship among taxonomic groups

Course Outcomes

B. Sc. First Year

Paper I- Diversity of Cryptogams-I

Upon completion of the course, the students will be able to- **CO1:** Identify various types of plants in kingdom Plantae **CO2:** Identify Cryptogams

CO3: Identify various types of Algae **CO4:** Describe various types of bacteria **CO5:** Describe various types of fungi **CO6:** Identify various types of viruses

Paper II- Morphology of Angiosperms

Upon completion of the course, the students will be able to-

CO1: Describe various types of habitat habit and morphological characters

CO2: Identify various types of root, stem and leaves **CO3:** Identify various types of inflorescence and flowers **CO4:** Identify various types of fruits

CO5: Describe modifications of roots stems and leaves

Paper V- Diversity of Cryptogams-II

Upon completion of the course, the students will be able to-

CO1: Describe Cryptogams

CO2: Describe characteristic feature of Bryophytes **CO3:** Describe Characteristic feature of Pteridophytes **CO4:** Identify various types of Bryophytes

CO5: Identify various types of Pteridophytes

Paper VI- Histology, Anatomy and Embryology

Upon completion of the course, the students will be able to-

CO1: Describe various types of tissues

CO2: Describe anatomical characters of monocot and dicot plants

CO3: Describe various types of ovules

CO4: Describe vascular elements in tissues

B. Sc. Second Year

Paper IX- Taxonomy of Angiosperms

Upon completion of the course, the students will be able to- **CO1:** Describe various Classification Systems of plants **CO2:** Describe characteristics of various angiosperm families **CO3:** Describe various taxonomic terminologies

CO4: Describe importance of plant studies

CO5: Describe various tools used in taxonomy

Paper X- Plant Ecology

Upon completion of the course, the students will be able to-

CO1: Describe importance of plant studies

CO2: Describe various terminologies used in ecology

CO3: Describe soil structure and soil types **CO4:** Describe various methods of conservation **CO5:** Describe ecological adaptations in plants

Paper XIII- Gymnosperms and Utilization of plants

Upon completion of the course, the students will be able to-

CO1: Differentiate angiosperm and gymnosperm

CO2: Describe the characteristic feature of gymnosperm plants

CO3: Describe economic importance of cereals pulses

CO4: Describe importance of timber plants

CO5: Describe medicinal values of plants

CO6: Describe uses of plants and their parts in various industries

Paper XIV- Plant Physiology

Upon completion of the course, the students will be able to- **CO1:** Describe various physiological processes of plants **CO2:** Describe photosynthesis

CO3: Describe transpiration

CO4: Describe respiration

CO5: Describe stomata and functions of stomata

CO6: Describe osmosis

B. Sc. Third Year

Paper XVII- Cell & Molecular Biology

Upon completion of the course, the students will be able to-

CO1: Describe Cell and cell structure **CO2:** Describe molecular basis of cell **CO3:** Describe various types of cells **CO4:** Describe mitosis and meiosis **CO5:** Identify various cell organelles

CO6: Describe various stages of cell division

Paper XVIII (A) - Diversity of Angiosperms-I

Upon completion of the course, the students will be able to- **CO1:** Describe various Classification Systems of plants **CO2:** Describe variations among angiosperm families

CO3: Describe various types of keys used for plant identification **CO4:** Describe various floral characters of angiosperm families **CO5:** Describe importance of plant studies and uses of plants

Paper XXI- Genetics & Biotechnology

Upon completion of the course, the students will be able to-

CO1: Describe genetics

CO2: Describe the basic information about gene, hybridisation and genetic material

CO3: Describe various genetic abnormalities

CO4: Describe mutation and chromosomal aberrations

CO5: Describe uses and applications of r-DNA technology

Paper XXII (A)- Diversity of Angiosperms – II

Upon completion of the course, the students will be able to-

CO1: Describe characteristic feature of various families of angiosperm plants

CO2: Describe the importance of plants of various families

CO3: Describe various tools used in taxonomy

CO4: Describe botanical gardens, bio-reservoirs and conserved forests

CO5: Describe herbariums and gene banks

Department of Zoology

Program Specific Outcomes

At the time of graduation, the students will be able to- **PSO1:** Understand concept of cell biology and genetics **PSO2:** Study various phylum and their classification **PSO3:** Understand mammalian physiology

PSO4: Recognize relationship between structure and function at all levels: molecular, cellular, and organismal

PSO5: Understand the chemistry and structure of all biological macromolecules including proteins and nucleic acids, determine their biological properties

PSO6: Understand ature and basic concepts of physiology, biochemistry, ecology, evolution and biotechnology

PSO7: Study animal diversity, including knowledge of specification, classification and evolutionary relationship of major groups of animals

PSO8: Understand biological, chemical and physical features of environment, e.g. terrestrial, freshwater, marine, host that animals inhabit

PSO9: Gain knowledge in the field of environment conservation, evolution and behaviour of animals

PSO10: Understand functions of organisms at the level of the gene, genome, cell, tissue, organ and organ-system

PSO11: Understand applications of rDNA technology to think critically and solve problems in the fields of biotechnology by applying research strategies

Course Outcomes

F.Y. B.Sc.

Semester I

Paper I- Protozoa to Annelida

Upon completion of the course, the students will be able to:-

CO1: Identify animals by observation

CO2: Describe unique characters of Protozoa, Porifera, Coelenterate, Helminthes and Annelids

CO3: Explain life functions of Protozoa, Porifera, Coelenterate, Helminthes and Annelids **CO4:** Describe ecological role of phylum Protozoa, Porifera, Coelenterata, Helminthes and Annelida

CO5: Identify diversity from Protozoa, Porifera, Coelenterate, Helminthes and Annelids

Paper II- Cell Biology

Upon completion of the course, the students will be able to:-

CO1: Describe in detail the structure of cell

CO2: Describe function and the composition of the plasma membrane

CO3: Explain principles of the cell theory

CO4: Differentiate between prokaryotes and eukaryotes

CO5: Understand importance of the nucleus and its components

CO6: Understand how the endoplasmic reticulum and Golgi apparatus interact with one another and know with which other organelles they are associated

CO7: Identify three primary components of the cell‟s cytoskeleton and how they affect cell shape, function, and movement

Semester II

Paper IV- Arthropoda to Echinodermata and Hemichordata Upon completion of the course, the students will be able to:- **CO1:** Identify animals by observation

CO2: Describe unique characters of Arthropods, Mollusks, Echinoderms and Hemichordates **CO3:** Explain life functions of Arthropods, Mollusks, Echinoderms and Hemichordates **CO4:** Explain ecological role of phylum from Arthropoda to Hemichordata

CO5: Explain in detail diversity from Arthropods to Hemichordate

Paper V- Genetics – I

Upon completion of the course, the students will be able to:-

CO1: Describe chemical basis of heredity

CO2: Explain role of genetics in evolution

CO3: Evaluate conclusions that are based on genetic data

CO4: Find the results of genetic experimentation in animal

S.Y. B.Sc.

Semester III

Paper VII- Vertebrate Zoology

Upon completion of the course, the students will be able to:-

CO1: Describe unique characters of urochordates, cephalochordates and fishes

CO2: Recognize life functions of urochordates to fishes

CO3: Explain ecological role of different groups of chordates

CO4: Explain the diversity of chordates and describe unique characters of amphibians, reptiles, aves and mammals

CO5: Describe life functions of amphibians, reptiles, aves and mammals

CO6: Explain ecological role of different classes of vertebrates

Paper VIII- Genetics - II

Upon completion of the course, the students will be able to:-

CO1: Explain in detail gene expression and its behaviour in transformation

CO2: Describe the role of genetics in evolution

CO3: Evaluate conclusions that are based on genetic data in population genetics

CO4: Describe genetic diseases and disorders

CO5: Explain the techniques that are used in genetic engineering

Semester IV

Paper XI- Animal Physiology

Upon completion of the course, the students will be able to:-

CO1: Describe in detail the physiology at cellular and system levels

CO2: Explain the role of different bio-molecules

CO3: Explain how mammalian body get nutrition from different bio-molecules

CO4: Describe the functions of different systems

CO5: Describe the physiology of respiratory, renal, endocrine and reproductive systems to define normal and abnormal functions

Paper XII- Biochemistry and Endocrinology

Upon completion of the course, the students will be able to:-

CO1: Describe in detail the metabolism of carbohydrates, proteins, fats

CO2: Explain the fundamental biochemical principles

CO3: Describe basic laboratory techniques in biochemistry **CO4:** Describe the structure and function of endocrine glands **CO5:** Explain the role of hormones

T.Y. B.Sc.

Semester V

Paper XV- Ecology

Upon completion of the course, the students will be able to:-

CO1: Describe abiotic and biotic factors that affect, the distribution, dispersal, and behaviour of organisms

CO2: Identify factors that affect biological diversity and the functioning of ecological systems

CO3: Use an ecological vocabulary in arguments and explanations of ecological phenomena

CO4: Apply concepts and theories from biology to ecological examples

CO5: Analyse and interpret ecological information, research and data

Paper XVI-F- Biotechnology-I

Upon completion of the course, the students will be able to:-

CO1: Describe the use of genetically engineered products to solve environmental problems

CO2: Explain principles for the basis of recombinant DNA technology

CO3: Explain steps involved in the production of by-products and methods to improve modern biotechnology and can apply basic biotechnological principles, methods and models to solve biotechnological tasks

Semester VI

Paper XIX- Evolution

Upon completion of the course, the students will be able to:-

CO1: Describe evolutionary history of man

CO2: Describe origin of species on earth

CO3: Have an enhanced knowledge and appreciation of evolutionary biology and behaviour

CO4: Perform, analyse and report on experiments and observations in whole-organism biology

CO5: Gain information regarding animal classification and systematic, animal structure and function relationships, evolution between and within major animal groups, human evolution and animal reproduction and development

Paper XX-F- Biotechnology-II

Upon completion of the course, the students will be able to:-

CO1: Demonstrate ability to apply research strategies like contamination and sterilization of laboratory in cell culture

CO2: Explain technical skills necessary for supporting biotechnology research activity in tissue culture and transgenic animal methods

CO3: Explain applications of biotechnology

CO4: Describe Gene therapy and DNA fingerprinting

CO5: Demonstrate knowledge of biotechnology concepts in ex vivo, in vivo gene therapy to diagnosis human diseases

Department of Physics

Programme Specific Outcomes

At the time of graduation, the students will be able to-

PSO1: Understand basic concepts of Mechanics, Optics, Thermodynamics and Mathematical methods of Physics

PSO2: Use effectively various basic measuring Instruments in laboratory

PSO3: Acquire Knowledge of mathematical Physics, Electronics, Statistical Physics and its applications

PSO4: Understand basic Laws of practical Physics

PSO5: Draw appropriate conclusions on outcomes of experiments

PSO6: Acquire ability to understand different types of crystal structures, classical and quantum theory of specific Heat, Electrodynamics with applications and Fibre Optics and its uses

PSO7: Understand and apply simple basics of Quantum mechanics

PSO8: Understand and solve Maxwell"s equations

PSO9: Gain comprehensive knowledge of various techniques used in laser and its applications

Course Outcomes

F.Y. B. Sc. Semester I

Paper I –Mechanics, Properties of Matter

Upon completion of the course, the students will be able to:

CO1: Describe acceleration due to gravity, Newton"s law of gravitation and basics of potential and fields

CO2: Discuss basic properties of matter, Young"s modulus, Bulk modulus and Modulus of rigidity

CO3: Discuss properties of matter especially viscosity and surface tension

CO4: Define the general terms in acoustics intensity, loudness, reverberation etc.

Paper II- Heat & Thermodynamics

Upon completion of the course, the students will be able to:

CO1: Define Thermal Conductivity, coefficient of thermal conductivity, Thermal diffusivity, and resistivity; give comparison of conductivities of various metals

CO2: Describe reason for modification of gas equation; derive Vander Waals equation of state; define critical constants

CO3: Explain Transport phenomenon, mean free path with expression, thermal conductivity and viscosity

CO4: Formulate and solve problems in Thermodynamics and Heat; explain adiabatic

Process, isothermal process, reversible process, irreversible process and derive relevant equation, draw indicator diagram

CO5: Derive Thermodynamic parameters, Heat engine and Carnot Heat Engine, Maxwell"s equation and their applications

Semester II

Paper-IV Geometrical and Physical Optics

Upon completion of the course, the students will be able to:

CO1: Describe and determine concept of cardinal point and different eye pieces **CO2:** Explain interference phenomenon of light and its relevant experiments **CO3:** Explain concept of diffraction of light and grating

CO4: Describe polarization of light and its related Experiments

Paper V- Electricity & Magnetism

Upon completion of the course, the students will be able to:

CO1: Describe the concept of Scalar, vector triple product of vector algebra and Solve divergence, gradient and curl

CO2: Explain Coulomb"s law, Gauss law and dielectrics with mathematical derivation **CO3:** Explain the concept of Biot-Savrat"s Law, Ampere"s Law and Ballistic Galvanometer **CO4:** Elaborate growth and decay of LCR circuit

S.Y. B. Sc. Semester III

Paper VII- Mathematical Physics and Relativity

Upon completion of the course, the students will be able to:

CO1: Explain partial differentiation, successive differentiation and total differentiation **CO2:** Describe ordinary differential equation and solutions of first and second order differentiation equation

CO3: Elaborate theories and methods of statistical Physics and quantum statics

CO4: Explain principle of special theory of relativity and derive relevant equations including Einstein equation

Paper VIII- Modern Physics

Upon completion of the course, the students will be able to:

CO1: Explain Photoelectric Effect and its applications in various processes

CO2: Describe X- Ray radiation and its spectra

CO3: Explain theoretical aspect of Atomic mass, nuclear fission and Energy released in nucleus

CO4: Describe Particle accelerator, Cyclotron and Deuterons

Semester IV

Paper XI- General Electronics

Upon completion of the course, the students will be able to:

CO1: Describe semiconductors, Zener diode, Transistor and give its application

CO2: Explain Amplifier, RC coupling and Transistor biasing and discuss its applications

CO3: Describe theoretical and practical aspects of Oscillator and Multi-vibrator

CO4: Elaborate modulation, FM Modulation and AM wave

Paper XII- Solid State Physics

Upon completion of the course, the students will be able to:

CO1: Explain types of solids, miller indices, inter planner spacing and different types of Crystal structures

CO2: Elaborate concept of inter atomic forces and Kroning Penney Model

CO3: Describe classical theory of lattice heat capacity and Debye model; discuss limitations of Debye model

CO4: Discuss applications of free electron theory of Metals, Hall effect, Hall voltage and Hall coefficient and importance of Hall Effect

CO5: Describe transport properties of electrical conductivity thermal conductivity

T.Y. B. Sc. Semester V

Paper XV- Classical & Quantum Mechanics

Upon completion of the course, the students will be able to:

CO1- Explain basic concept of Classical Mechanics, mechanics of particle, and mechanics of system of particle by using Newton"s laws of motion

CO2- Derive Lagrange"s equation and its various applications

CO3- Explain basic concepts of constraints, its types and Virtual work done

CO4- Discuss mathematical basics of quantum mechanics, explain matter wave, Group velocity, particle velocity, operators, wave function and expectation values

CO5- Derive Schrodinger time dependent and independent equation and describe particle in one-dimensional box

Paper XVI- Electrodynamics

Upon completion of the course, the students will be able to:

CO1: Describe and understand diversions, curl, and Gauss Law applications in Electrostatics

CO2: Explain concepts of self-induction, mutual induction and equation of continuity

CO3: Describe origin of Maxwell"s equations in magnetic and dielectric media

CO4: Derive electromagnetic wave equation in conduction medium

CO5: Explain transport of energy and poyinting vector, poyinting theorem

CO6: Describe boundary condition for electromagnetic field vectors B, E, D and H

Semester VI

Paper XIX- Atomic, Molecular Physics & LASER

Upon completion of the course, the students will be able to:

CO1: Explain Thomson"s atom model, Rutherford"s nuclear atom model and Bohr"s atom model

CO2: Describe the concepts of Vector atom model, quantum numbers, Coupling Scheme and Pauli"s exclusive principle

CO3: Explain Zeeman Effect and Stark effect

CO4: Describe Rotation, Vibration Spectra, Raman Effect and its applications in various fields

CO5: Discuss LASER system and its properties, types of LASER and its medical, biological and industrial applications

Paper XX- Non-conventional Energy Sources and Optical Fiber

Upon completion of the course, the students will be able to:

CO1: Explain the concept of technologies of non-conventional sources of energy

CO2: Describe various renewable energy technology

CO3: Discuss non-conventional energy sources: Biomass, wind energy, tidal energy, ocean energy, geothermal energy and solar energy

CO4: Elaborate the concept of solar energy and its applications in various fields

CO5: Describe structures of optical fibers

CO6: Describe fiber fabrication techniques and testing of optical fiber cables

Department of Chemistry

Programme Specific Outcomes

At the time of graduation, the students will be able to-

PSO1: Understand the fundamental principles of Chemistry

PSO2: Develop skills in evaluation and interpretation of chemical information and data

PSO3: Identify and estimate organic and inorganic compounds using classical and modern laboratory methods

PSO4: Analyze various organic mixtures and individual compounds

PSO5: Develop skills in the safe-handling of chemical materials, taking into account of their physical and chemical properties including any specific hazards associated with their use

PSO6: Gain comprehensive knowledge about fundamental properties of elements

PSO7: Acquire knowledge regarding importance of various elements present in the periodic table, coordination chemistry, structure of molecules, properties of compounds and structural determination of complexes using theoretical and instrumental methods

PSO8: Perform accurate quantitative measurements with an understanding of the theory and use of contemporary chemical instrumentation, interpret experimental results, perform calculations on these results and draw reasonable accurate conclusion

PSO9: Synthesize, separate and characterize compounds using published reactions, protocols, standard laboratory equipment and modern instrumentation

PSO10: Acquire problem solving skills in three basic areas of Chemistry, i.e., Inorganic, Organic and Physical Chemistry

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Course Outcomes

F.Y. B.Sc.

Semester I

Paper No. I (Inorganic Chemistry)

Upon completion of the course, the students will be able to-

CO1: Predict atomic structure and explain various quantum numbers

CO2: Explain standardized names and symbols to represent atoms, molecules, ions and chemical reactions

CO3: Explain trends of periodic properties of elements in periodic table

CO4: Predict biological role of Alkali and Alkaline earth metals

Paper No. II (Organic Chemistry)

Upon completion of the course, the students will be able to-

CO1: Explain various effects, and properties of organic compounds, nature of bond

CO2: Discuss nature of bond breaking and mechanical phenomenon

CO3: Explain concept of isomerism and types of stereochemical configuration

CO4: Discuss mechanistic pathways of simple organic reaction

Semester II

Paper No. IV (Physical Chemistry)

Upon completion of the course, the students will be able to-

CO1: Differentiate colloids, liquid crystals and properties of solid, liquid and gas

CO2: Derive differential equations related to order of reactions

CO3: Explain and correlate various laws with respect to gaseous state

CO4: Categorize catalysis on the basis of phases

CO5: Identify areas of applications of colloids, enzyme catalysts in day to day life

Paper No. V (Inorganic Chemistry)

Upon completion of the course, the students will be able to-

CO1: Demonstrate preparation, physical and chemical properties, structural properties, applications of various elements

CO2: Discuss chemical bonding, hybridization and molecular geometry on the basis of VBT

CO3: Differentiate types of indicators and correlate with appropriate titration method

CO4: Explain various aspects of radioactivity

Practicals (Lab course)

Upon completion of the course, the students will be able to-

CO1: Prepare and standardize various solutions

CO2: Determine basicity of given organic acid

CO3: Determine viscosity of given liquid

CO4: Identify acidic and basic radicals in given mixture

CO5: Identify types of organic compounds by chemical analysis method

S.Y. B.Sc.
Semester III

Paper No. VII (Organic Chemistry)

Upon completion of the course, the students will be able to-

CO1: Give types of alcohol and its identification in simple organic compounds

CO2: Differentiate alcohol and phenols in simple and complex organic molecules

CO3: Explain the structure of carbonyl compounds and type of various name reaction involving carbonyl group

CO4: Analyse effect of substituent on acidity of carboxylic acid

CO5: Analyse effect of basicity in various simple heterocycles

Paper No. VIII (Physical Chemistry)

Upon completion of the course, the students will be able to-

CO1: Distinguish isothermal, adiabatic, isochoric and other thermodynamic processes

CO2: Correlate law of mass action, equilibrium constant with free energy

CO3: Solve numerical problems related to efficiency, work done, heat change

CO4: State and explain postulates of laws of Thermodynamics

CO5: Interpret interrelations between Clapeyron, Clausius and other relevant equations

Semester IV

Paper No. X (Inorganic Chemistry)

Upon completion of the course, the students will be able to-

CO1: Present in depth knowledge of abundance, position, preparation, properties and chemical behaviour of various d and f block elements from the periodic table

CO2: Identify co-ordination compounds and its applications

CO3: Differentiate aqueous and non aqueous solvents

Paper No. XI (Physical Chemistry)

Upon completion of the course, the students will be able to- **CO1:** Explain different types of conductomertic titrations **CO2:** Solve mathematical problems on electro-chemistry **CO3:** Explain phase diagrams of one component systems **CO4:** Explain phase diagrams of two component systems **CO5:** Classify electrochemical and electrolytic cells

Practicals (Lab course)

Upon completion of the course, the students will be able to-

CO1: Determine concentration values of sample solutions using instrumentation

CO2: Evaluate and interpret heat of neutralization reactions

CO3: Analyse quantitatively, specific elements by volumetric and gravimetric methods

CO4: Determine critical solution temperatures of heterogeneous phases

CO5: Determine the molar refractive index of given sample by refractometer **CO6:** Prepare organic derivatives and determine physical constants

CO7: Estimate ester, amide and other organic molecule entities

Paper No. XIII (Physical Chemistry)

Upon completion of the course, the students will be able to-

CO1: Explain synthesis of nanomaterials

CO2: Solve mathematical problems on determination of bond length

CO3: Derive Schrodinger wave equation of Hydrogen atom

CO4: Explain basic features of different spectrometers

CO5: Determine structure of molecules applying magnetic property

Paper No. XIV (Organic Chemistry)

Upon completion of the course, the students will be able

to- **CO1:** Find out types of sets of proton in organic compound

CO2: Solve simple PMR problems with given ata**CO3:** Classify various organometallic compounds and activity in simple organic transformation

CO4: Identify and classify various active Methylene compounds

Semester VI

Paper No. XVI (Inorganic Chemistry)

Upon completion of the course, the students will be able to-

CO1: Explain nature of metal-ligand bonding and illustrate splitting of d orbitals

CO2: Demonstrate mechanism of sodium potassium cycle

CO3: Describe essential and trace elements and their role in biological system

CO4: Categorize chromatographic techniques with reference to adsorbents and other components

Paper No. XXII (Organic Chemistry)

Upon completion of the course, the students will be able to-

CO1: Explain effect of aromaticity on strength of basicity of heterocyclic compound

CO2: Classify carbohydrates and its utility in day to day life

CO3: Explain synthesis of paracetamol

CO4: Explain properties of good Drugs

Practicals (Lab course)

Upon completion of the course, the students will be able to-

CO1: Identify organic mixtures by chemical analysis method

CO2: Analyse inorganic radicals by chemical analysis method

CO3: Identify and separate given mixtures by gravimetric and volumetric method

CO4: Analyse percent composition of acid mixture by Conductometric method

CO5: Identify empirical formula by potentiometric method

T.Y. B.Sc. Semester V

Department of Microbiology

Programme Specific Outcomes

At the time of graduation, the students will be able to-

PSO1: Understand fundamental principles involved in Microbiology

PSO2: Acquire detail knowledge of microorganisms, their types and significance

PSO3: Understand metabolic and structural significance of bio-molecules

PSO4: Acquaint with concepts of Immunity, Antigen, Antibody and Immune system

PSO5: Understand importance and applications of various enzymes in replication transcription and translations

PSO6: Acquire detail knowledge of industrial production of enzymes, antibiotics and vitamins

Course Outcomes

F.Y. B. Sc. Semester I

Paper I – Fundamentals of Microbiology

At the end of the course, the students will be able to-

CO1: Identify distribution of microorganism in nature

CO2: Determine evolution of microbiology and their role in various biological processes **CO3:** Classify Microorganisms into different category according to taxonomic ranks **CO4:** Determine Biochemical properties of microorganisms

CO5: Calculate magnification, resolving power, depth of focus, numerical aperture of Microscope

Paper II- Microbial Techniques and General Microbiology

At the end of the course, the students will be able to-

CO1: Conceptualize microorganisms and their types, importance and Practical aspects

CO2: Distinguish between beneficial and harmful Microbes

CO3: Cultivate, observe and perform microscopic identification of bacteria, fungi and other microbes

CO4: Describe concept, methods and pattern of Sterilization and its practical applicability

CO5: Discuss role of Microorganisms in spreading diseases, usefulness in agriculture, environment and industrial sector

Semester II

Paper-IV Cytology and general Microbiology

At the end of the course, the students will be able to-

CO1: Describe different structural parts & its arrangement of Microbial cells

CO2: Classify bacteria on nutritional requirements

CO3: Determine Bacterial growth curve

CO4: Calculate mathematics of bacterial growth curve **CO5:** Describe mode of nutrient uptake by bacteria **CO6:** Describe Bacterial photosynthesis

CO6: Discuss advances in Microbiology

CO7: Determine shape, size and structure of bacteria by various staining procedures

Paper V- Basic Biochemistry

At the end of the course, the students will be able to-

CO1: Describe structures, functions and classification of carbohydrates, proteins, amino acids, lipids, nucleic acids

CO2: Discuss metabolic and structural significance of bio-molecules

C03: Describe functional groups and biochemical interactions present in bio-molecules

C04: Explain concept of pH, buffer, titration curve and pKa value

CO5: Explain concept of enzyme, physicochemical factors contributing to enzyme activity

CO6: Discuss nutrients uptake of microbes, anaerobic respiration and photosynthesis

S.Y. B. Sc. Semester III

Paper VII- Environmental Microbiology

At the end of the course, the students will be able to-

CO1: Determine sources of Air, Water and Soil pollution and their effects **CO2:** Describe processes involved in purification of sewage and portable water **CO3:** Determine Air sampling techniques and its effectiveness

O4: Classify eneterobacter by various Biochemical tests: IMViC, MPN, Elevated temperature test

CO5: Calculate BOD, COD, Chlorine in water

CO6: Discuss relationship between soil microorganisms, Role of bio-fertilizers

CO7: Describe various biogeochemical cycles

Paper VIII-Immunology

At the end of the course, the students will be able to-

CO1: Explain concept of Immunity, Antigen, Antibody, Immune system

CO2: Describe structure, Classes, biological activity and gene Organization of antibodies and their diversity

CO3: Rationalize Expression of Ig genes, Monoclonal antibody (Chimeric Antibody and Humanized Antibody) and its formation and applications

CO4: Describe Lymphocyte (T and B cell) Activation and Regulation, Effecter Mechanism, Complement System: Activation and its Regulation

CO5: Discuss Diagnostic application of immunology: Practical aspects of Antigen-Antibody Interaction: Precipitation and Agglutination

CO6: Perform Blood grouping, isolation of bacterial Antigen and Ag-Ab reactions

Semester IV

Paper XI-Applied Microbiology

At the end of the course, the students will be able to-

CO1: Describe composition of milk, associated microorganism and Milk Sterilization

CO2: Discuss Food and Microorganisms, source of food contamination and food preservation

CO3: Describe Food born disease and Intoxication and Pathogen associated with food poisoning

CO4: Discuss mechanism of preparation of fermented foods and probiotics with the help of microorganisms

Paper XII-Clinical Microbiology

At the end of the course, the students will be able to-

CO1: Determine mode of entry, infection, symptoms, Laboratory diagnosis and treatment for Bacterial, fungal, Protozoan infections

CO2: Describe life cycle, pathogenesis, laboratory diagnosis of HIV, Oncogenic viruses

CO3: Determine nutrients for cultivation of pathogenic bacteria

CO4: Identify epidemiology of general bacterial, fungal, protozoan infections

CO5: Identify normal micro-flora of humans

CO6: Determine antibiotic resistance by Bacteria

T.Y. B. Sc. Semester V

Paper XV-Microbial Genetics

At the end of the course, the students will be able to-

CO1: Differentiate gene expression pattern between microorganisms and eukaryotes

CO2: Discuss importance and applications of different genes (structural genes, functional genes etc)

CO3: Discuss importance and applications of various enzymes in the processes viz. replication transcription and translations etc

CO4: Describe various types of RNA and their role during translation, tRNA activations etc

CO5: Discuss mutation, its types and related effects like loss of function and gain of functions etc

CO6: Explain re-combinations- transduction, conjugation with types and transformations etc

Paper XVI-Microbial Metabolism

At the end of the course, the students will be able to-

C01: Describe enzyme as biocatalyst, its classification and mechanism of action

CO2: Discuss metabolic role of coenzymes

CO3: Give industrial applications of free and immobilized enzyme

CO4: Explain bacterial anabolic-catabolic pathways and their regulation

CO5: Discuss modes of energy yielding metabolism, microbial fermentation and its significance

C06: Determine factor affecting enzyme activity, overall enzyme kinetics viz. Km, Vmax, Kcat

C07: Prepare buffers, reagents and stock solutions

Semester VI Paper XIX-Recombinant DNA Technology

At the end of the course, the students will be able to-

CO1: Discuss handling and applications of different DNA and RNA modifying enzymes

CO2: Elaborate techniques used for DNA transformation in host cells

CO3: Describe design of various vectors used for plants, animals and microorganisms and their modification strategies

CO4: Design cloning strategies for various applications

CO5: Differentiate transformed and non-transformed colonies

Paper XX-Industrial Microbiology

At the end of the course, the students will be able to-

CO1: Elaborate various aspects of industrial technology related to Microbiology

CO2: Screen industrially important strains

CO3: State and explain principles of fermenter design and computer assisted fermentation control

C04: Discuss fermentation process and downstream processing

CO5: Formulate media, aspects of raw material used, methods of strain improvement

CO6: Describe industrial production of enzyme, antibiotics, amino acids and vitamins

CO7: Produce, purify and estimate various products, like enzymes, ethanol, acids, and antibiotics with the help of microbes

Department of Mathematics

Programme Specific Outcomes

At the time of graduation, the students will be able to:

PSO1: Acquire knowledge in basic Mathematics

PSO2: Communicate solutions of mathematical problems effectively

PSO3: Equip knowledge in various concepts involve in Calculus, differential equation, real analysis and algebra

PSO4: Acquire a breadth and depth of understanding in mathematics

PSO5: Understand reasonableness of solutions including sign, size, accuracy and units of measurement

PSO6: Apply mathematical proof techniques in a wide variety of mathematical areas, including algebra and analysis

Differential Calculus

Course Outcomes

F.Y. B.Sc. Semester I

At the end of the course, the students will be able to:

CO1: Solve problems on limits continuity and successive differentiation of Functions

CO2: Determine partial derivative of function more than one variable

CO3: Describe Rolle‟s Theorem, Lagrange‟s mean value theorem and Cauchy‟s mean value theorem

CO4: Determine expansion of e^x, sinx, cosx, sinhx, coshx, tanhx, log (ax+b) etc.

CO5: Determine gradient, divergence and curl and directional derivatives

Differential Equations

At the end of the course, the students will be able to:

CO1: Determine solution of first order linear differential equation

CO2: Determine solution of exact differential equation

CO3: Determine solution of linear equation with constant coefficient using general and short method

CO4: Determine solution of linear homogeneous differential equation

CO5: Explain formation of partial differential equation by eliminating the arbitrary constants and functions

Semester II

Integral Calculus

At the end of the course, the students will be able to:

CO1: Apply reduction formula

CO2: Find integration of algebraic rational functions **CO3:** Apply fundamental theorem of integral calculus **CO4:** Find the area bounded by a curve.

CO5: Calculate the length of arc of a curve.

CO6: Find line integral and surface integrals.

CO7: Apply the theorems of Gauss, Green"s and Stoke"s theorem

Geometry

At the end of the course, the students will be able to:

CO1: Identify and use different type of equations of plane

CO2: Determine equations of the system of planes and the length of perpendicular to a plane

CO3: Determine equation of right line and the angle between the plane and line **CO4:** Determine condition for coplanar lines and short distance between two lines **CO5:** Determine equation of sphere and its intersection with the plane

S.Y. B.Sc. Semester III

Number Theory

At the end of the course, the students will be able to:

CO1: Describe division algorithm and solve the problem on it **CO2:** Determine GCD and LCM by using Euclidean algorithm **CO3:** Describe method of solving linear Diophantine equation **CO4:** Determine solution of linear congruence

CO5: Describe Fermat"s and Euler"s theorem

Integral Transform

At the end of the course, the students will be able to:

CO1: Define beta and gamma functions and derive their properties and apply them in evaluating integrals

CO2: Determine Laplace transform for various functions, properties of Laplace transforms **CO3:** Determine inverse Laplace transform, properties of inverse Laplace Transform, solve the problems using convolution theorem

CO4: Determine Fourier transform, properties of Fourier transform, Fourier sine and cosine transforms

CO5: Apply Laplace transform to find solutions of ordinary and partial differential equations

Mechanics-I

At the end of the course, the students will be able to:

CO1: Describe different types of forces, triangle law of forces, Parallelogram of forces, resultant of forces, sine rule and cosine rule

CO2: Explain resultant of several coplanar forces, equation of the line of action of the resultant, equilibrium of a rigid body under 3 coplanar forces

CO3: Explain Lammi"s theorem and polygon of forces

CO4: Explain vector moment of a force and vector moment of couple

CO5: Describe basic concepts of centre of gravity and its applications

Semester IV

Numerical Methods

At the end of the course, the students will be able to:

CO1: Explain Bisection Method, Method of False Position, Newton-Raphson Method

CO2: Describe Finite Differences, Newton"s Formula for Interpolation, Lagrange"s Interpolation Formula, Divided Differences

CO3: Describe Least Square Curve Fitting Procedures, Fitting a straight line, Chebyshev polynomial, Power series

CO4: Calculate Solution of Linear system of equations, Eigen values and Eigen Vectors **CO5:** Calculate solution of ordinary differential equation by Taylor"s series Method, Picard"s Method, Euler"s Method

Partial Differential Equation

At the end of the course, the students will be able to:

CO1: Solve Lagrange"s equation

CO2: Find different types of solutions like complete integral, Singular integral and general integral

CO3: Determine the solution of partial differential equations using Charpit"s Method

CO4: Classify partial differential equations to special types

CO5: Describe Monge"s Method, Method of transformation

Mechanics II

At the end of the course, the students will be able to:

CO1: Find velocity and acceleration in terms of vector derivatives, curvature, Angular speed and angular velocity

CO2: Describe Radial and Transverse components of velocity and acceleration, areal speed and velocity

CO3: Explain Newton"s Law of motion, angular momentum, work, energy, vector point function, Field of force

CO4: Describe motion under gravity, projectile, Motion of projectile, Parabola of safety

CO5: Describe motion in resisting medium

CO6: Describe areal velocity of central orbit, Pedal"s equation

Real Analysis –I

T.Y. B.Sc. Semester V

At the end of the course, the students will be able to:

CO1: Describe sets, functions, real valued functions, countable sets, Least upper Bound axiom and greatest lower bound axiom.

CO2: Give different types of sequence such as convergent, Divergent, monotone and its properties

CO3: Describe limit superior, limit inferior and Cauchy sequence

CO4: Explain basic concepts of series such as convergent, divergent, alternating series

CO5: Describe absolute and conditional convergence of the series

Abstract Algebra- I

At the end of the course, the students will be able to:

CO1: Explain elementary concepts of sets, functions and integrals

CO2: Describe group, subgroup, counting principle, Normal subgroup, Quotient groups, Homomorphism

CO3: Define Ring, some special types of ring

CO4: Describe Ideals, Maximal Ideals

CO5: Explain quotient ring, polynomial ring

Mathematical Statistics-I

At the end of the course, the students will be able to: **CO1:** Explain frequency distribution, Histogram
CO2: Describe measures of central tendency

CO3: Describe Dispersion and Kurtosis

CO4: Explain concepts of random variables and its characteristics

CO5: Explain concept of the probability with illustration

Semester VI

Real Analysis –II

At the end of the course, the students will be able to:

CO1: Find Limits in Metric spaces

CO2: Explain continuous functions on Metric spaces

CO3: Describe connectedness, completeness and compactness

CO4: Describe set of Measure zero, Riemann integral, Fundamental theorem of calculus.

CO5: Explain Fourier series

Abstract Algebra- II

At the end of the course, the students will be able to:

CO1: Describe elementary basic concepts of vector spaces

CO2: Explain Linear independence and bases

CO3: Describe dual spaces

CO4: Describe inner product spaces

CO5: Explain modules with illustrations

Mathematical Statistics-II

At the end of the course, the students will be able to:

CO1: Find Mathematical Expectation and generating functions

CO2: Explain theoretical discrete probability distribution

CO3: Describe uniform distribution, binomial distribution, Normal Distribution, Gamma distribution

CO4: Describe correlation coefficient

CO5: Describe regression with examples

Department of Computer Science

Programme Specific Outcomes

At the time of graduation, the students will be able to-

PSO1: Understand basics of software systems

PSO2: Design, implement and document solutions to significant computational problems **PSO3:** Demonstrate understanding of principles and working of hardware and software systems of computer systems

PSO4: Apply fundamental principles and methods of Computer Science to a wide range of applications

PSO5. Design, implement, test, and evaluate computer system, component, or algorithm to meet desired needs and to solve computational problems

PSO6: Develop proficiency in the practice of computing

PSO7: Apply problem-solving skills and knowledge of Computer Science to solve real problems

PSO8: Enhance programming skills and adapt new computing technologies for attaining professional excellence and carrying research

Course Outcomes

Semester I

Computer Fundamentals

Upon completion of the course, the students will be able to-

CO1: Explain various steps involved in problem solving techniques

CO2: Classify 7-8 high-level programming languages and two operating systems **CO3:** Analyze complex problems and the synthesis of solutions to those problems **CO4:** Explain software engineering principles

Digital Electronics

Upon completion of the course, the students will be able to-

CO1: Define digital components and devices

CO2: Explain logic gates and realization of OR, AND, NOT AND XOR Functions using universal gates

CO3: Explain combinational circuits like half adder/full adder, half subtractor/full subtractor, code converters, comparators, MUX/DEMUX

CO4: Evaluate sequential circuits like flip-flops, counters and shift registers

Microprocessor- I

Upon completion of the course, the students will be able to-

CO1: Define taxonomy of microprocessors and knowledge of contemporary microprocessors **CO2:** Explain architecture, bus structure and memory organization of 8086 as well as higher order microprocessors

CO3: Explore techniques for interfacing I/O devices to the microprocessor 8086 including several specific standard I/O devices such as 8251 and 8255

CO4: Define programming using the various addressing modes and instruction set of 8086 microprocessor

C-programming II

Upon completion of the course, the students will be able to-

CO1: Explain flowchart and design algorithm for a given problem and to develop IC programs using operators

CO2: Define conditional and iterative statements to write C programs

CO3: Classify user defined functions to solve real time problems

CO4: Describe C programs that use Pointers to access arrays, strings and functions

CO5: Explain user defined data types including structures and unions to solve problems

Communications Skill – I

Upon completion of the course, the students will be able to-

CO1: Describe importance of communication in daily life

CO2: Elaborate importance of grammar as an effective tool for accuracy in communication

CO3: Describe listening is the most important aspect of all communication skills **CO4:** Develop body language is an important aspect of effective communication **CO5:** Discuss how pronunciation of words is essential for better comprehension in communication

Mathematical Foundation

Upon completion of the course, the students will be able to-

CO1: Define set and constructing proofs

CO2: Draw graphs on the basis of available data **CO3:** Explain relations and determine their properties **CO4:** Classify functions

Semester II

Data Structure

Upon completion of the course, the students will be able to-

CO1: Define concept of Dynamic memory management, data types, algorithms

CO2: Give basic data structures such as arrays, linked lists, stacks and queues

CO3: Describe the hash function and concepts of collision and its resolution methods

CO4: Explain problem involving graphs, trees and heaps

CO5: Solve algorithm for sorting, searching, insertion and deletion of data

Operating Systems

Upon completion of the course, the students will be able to- **CO1:** Define the main components of an OS & their functions **CO2:** Explain the process management and scheduling

CO3: Elaborate various issues in Inter Process Communication (IPC) and the role of OS in IPC

CO4: Describe the concepts and implementation

Microprocessor- II

Upon completion of the course, the students will be able to-

CO1: Define the taxonomy of microprocessors and knowledge of contemporary microprocessors

CO2: Explain architecture, bus structure and memory organization of 8086 as well as higher order microprocessors

CO3: Explore techniques for interfacing I/O devices to the microprocessor 8086 including several specific standard I/O devices such as 8251 and 8255

CO4: Classify programming using the various addressing modes and instruction set of 8086 microprocessor

C-programming II

Upon completion of the course, the students will be able to-

CO1: Give flowchart and design algorithm for a given problem and to develop IC programs using operators

CO2: Develop conditional and iterative statements to write C programs

CO3: Exercise user defined functions to solve real time problems

CO4: Explain C programs that use Pointers to access arrays, strings and functions

CO5: Classify user defined data types including structures and unions to solve problems

Communications Skill – II

Upon completion of the course, the students will be able to-

CO1: Give importance of communication in daily life

CO2: Describe how grammar is an effective tool for accuracy in communication

CO3: Elaborate importance of all communication skills

CO4: Explain body language as an important aspect of effective communication **CO5:** Give importance of pronunciation of words for better comprehension in communication

Numerical Computational Method

Upon completion of the course, the students will be able to-

CO1: Describe error analysis for a given numerical method

CO2: Explain an algebraic or transcendental equation using an appropriate numerical method

CO3: Prove results for numerical root finding methods

CO4: Explain approximate a function using an appropriate numerical method

Semester III

Advance Data Structure

Upon completion of the course, the students will be able to-

CO1: Explain asymptotic notation, its properties and use in measuring algorithm behaviour

CO2: Explain mathematical principles to solve various problems

CO3: Evaluate complexities of various algorithms and select the best

CO4: Describe different strategies that are known to be useful in finding efficient algorithms to solve problems and to be able to apply them

CO5: Use appropriate data structure and algorithms to solve a particular problem

UNIX Operating system

Upon completion of the course, the students will be able to-

CO1: Develop software for Linux/UNIX systems

CO2: Define C language and get experience programming in C

CO3: Explain important Linux/UNIX library functions and system calls

CO4: Verify the inner workings of UNIX-like operating systems

CO5: Define a foundation for an advanced course in operating systems

PC maintenance

Upon completion of the course, the students will be able to-

CO1: Describe electronic circuits with the knowledge of courses related circuits, networks, linear digital circuits and analog electronics

CO2: Explore the scientific theories, ideas, methodologies in operation and maintenance of communication systems to bridge the gap between academics and industries

CO3: describe work profession with new cutting edge Technologies in the fields of electronic design, communication and automatio

CO4: Describe operating system and other application software

Programming in CPP

Upon completion of the course, the students will be able to-

CO1: Explain the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects

CO2: Describe dynamic memory management techniques using pointers, constructors, destructors

CO3: Explain concept of function overloading, operator overloading, virtual functions and polymorphism

CO4: Describe inheritance with the understanding of early and late binding, usage of exception handling, generic programming

DBMS

Upon completion of the course, the students will be able to-

CO1: Describe different issues involved in the design and implementation of a database system

CO2: Explain physical and logical database designs, database modelling, relational, hierarchical, and network models

CO3: Explain data manipulation language to query, update, and manage a database

CO4: Describe DBMS concepts such as: database security, integrity, concurrency

Statistical Method

Upon completion of the course, the students will be able to-

CO1: Explain inferential and descriptive statistics. Differentiate between a quantitative and a qualitative variable, Know the four levels of measurement: - nominal, ordinal, interval, and ratio

CO2: Define frequency distribution, determine the class midpoints, relative frequencies, and cumulative frequencies of a frequency distribution, Construct a Histogram, a Frequency Polygon, and a Pie Char.

CO3: Define mean, mode, and median. Explain the characteristics of the mean, mode, and median.

CO4: Calculate mean, mode and median for both grouped and ungrouped data

Semester IV

Software Engineering

Upon completion of the course, the students will be able to-

CO1: Describe successful professionals in the field with solid fundamental knowledge of software engineering

CO2: Utilize and exhibit strong communication and interpersonal skills, as well as professional and ethical principles when functioning as members and leaders of multi- disciplinary teams

CO3: Explain foundations in software engineering to adapt to readily changing environments using the appropriate theory, principles and processes

CO4: Describe the issues affecting the organization, planning and control of software.

Fedora

Upon completion of the course, the students will be able to-

CO1: Describe various contents of Linux

CO2: Give the requirements in Linux system installation

CO3: Describe the concept of handling Linux and performing operations using Linux commands and tools

CO4: Describe the basics of Linux, logical channels, advantages and limitations

Basics of Networking

Upon completion of the course, the students will be able to-

CO1: Describe concepts of OSI reference model and the TCP/IP reference model

CO2: Describe concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks

CO3: Explain wireless networking concepts

CO4: Explain contemporary issues in networking technologies

CO5: Explain network tools and network programming

Core Java

Upon completion of the course, the students will be able to-

CO1: Define structure and model of the Java programming language

CO2: Use the Java programming language for various programming technologies

CO3: Describe software in the Java programming language

CO4: Evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements

Adv. DBMS

Upon completion of the course, the students will be able to-

CO1: Explain elementary and advanced features of DBMS and RDBMS

CO2: Describe conceptual frameworks and definitions of specific terms that are integral to the Relational Database Management Systems

CO3: Define basic concepts of Concurrency Control and database security

CO4: Prepare various database tables and joins them using SQL commands

Web Fundamental

Upon completion of the course, the students will be able to-

CO1: Describe history of the internet and related internet concepts that are vital in understanding web development

CO2: Discuss insights of internet programming and implement complete application over the web

CO3: Describe important HTML tags for designing static pages and separate design from content using Cascading Style sheet.

CO4: Define the concept of JavaScript"s

Semester V

Software Cost Estimation

Upon completion of the course, the students will be able to-

CO1: Prepare SRS document, design document, test cases and software configuration management and risk management related document

CO2: Describe function oriented and object oriented software design using tools like rational rose

CO3: Describe unit testing and integration testing

CO4: Describe various white box and black box testing techniques

Android OS

Upon completion of the course, the students will be able to-

CO1: Explain android platform Architecture and features

CO2: Design User Interface and develop activity for Android Applications

CO3: Define Intent, Broadcast receivers and Internet services in Android Applications

CO4: Design database Application and Content providers

Core Java-II

Upon completion of the course, the students will be able to-

CO1: Describe fundamentals of programming such as variables, conditional and iterative execution, methods

CO2: Explain fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries

CO3: Give important topics and principles of software development

CO4: Elaborate computer program to solve specified problems

CO5: Discuss Java SDK environment to create, debug and run simple Java programs

Computer Graphics

Upon completion of the course, the students will be able to-

CO1: Elaborate basics of Computer Graphics, different graphics systems and applications of Computer Graphics

CO2: Summarise the working principle of Display devices

CO3: Explain various algorithms for scan conversion and filling of basics objects and their comparative analysis

CO4: Analyse line, Circle and Ellipse and Character generation algorithm

CO5: Describe Geometric transformations including Translation, Scaling, rotation and Shear for 2D objects

CO6: Describe Geometric transformations including Translation, Scaling, rotation and Shear for 3D objects

Beginners Programming with PHP

Upon completion of the course, the students will be able to-

CO1: Describe client server architecture and able to develop a web application using java technologies to create fully functional website/web applications

CO2: Describe role of language PHP and workings of the web and web applications

CO3: Prepare web page and identify its elements and attributes

CO4: Create dynamic web pages

Advanced Networking

Upon completion of the course, the students will be able to-

CO1: Describe state-of-the-art in network protocols, architectures and applications

CO2: Describe existing network protocols and networks

CO3: Define new protocols in networking

CO4: Evaluate research in networking

CO5: Investigate novel ideas in the area of networking via term-long research projects

Semester VI

Software Quality & Testing

Upon completion of the course, the students will be able to-

CO1: Describe reason for bugs and analyze the principles in software testing to prevent and remove bugs

CO2: Classify various test processes for quality improvement

CO3: Define test planning

CO4: Discuss test process

CO5: Explain software testing techniques in commercial environment

Android Application Development

Upon completion of the course, the students will be able to-

CO1: Install and configure Android application development tools

CO2: Design user Interfaces for the Android platform

CO3: Evaluate information across important operating system events

CO4: Explain Java programming concepts to Android application development

Theory of Computation

Upon completion of the course, the students will be able to-

CO1: Explain finite state machines and the equivalent regular express

CO2: State and prove the equivalence of languages described by finite state machines and regular expressions

CO3: Classify pushdown automata and the equivalent context free grammars

CO4: Verify equivalence of languages described by pushdown automata and context free grammars

Advanced Computer Graphics

Upon completion of the course, the students will be able to-

CO1: Give importance of viewing and projections

CO2: Explain the fundamentals of animation, virtual reality and its related technologies

CO3: Describe typical graphics pipeline

CO4: Design an application with the principles of virtual reality

Advanced Programming with PHP

Upon completion of the course, the students will be able to-

CO1: Explain general concept of PHP scripting language for the development of Internet websites

CO2: Define basic functions of My SQL database program

CO3: Give relationship between the client side and the server side scripts

CO4: Evaluate final project using the learned techniques

Ethics and Cyber law

Upon completion of the course, the students will be able to-

CO1: Explain ethical way of using computer, computer networks and Internet

CO2: Define the terms such as ethics, morals, character, ethical principles and ethical relativism

CO3: State laws and rules for using computer recourses and making them secure

CO4: State and explain laws concerning Cyber Space