B.C.A. Program Outcomes
1. It facilitates the graduates to use and apply current technical concepts and practices in the core computer applications 2.Identify computer application related problems, analyze them and design the system or provide the solution for the problem considering legal, ethical and societal issues. 3.The program also empowers the graduates to appear for various competitive examinations or choose the post graduate programme of their choice (M.C.A &M.Sc (C.S.)). 4.Students learn to work and communicate effectively in interdisciplinary environment, either independently or in team, and demonstrate scientific leadership in academic and industry. 5.Recognize the need for and an ability to engage in continuing professional development. 6.Thisprogramme makes learners aware of the history of the discipline of Computer Science and understand the conceptual underpinnings of the subject. 7. Students understand the nature of the software development process, including the need to provide appropriate documentation. 8. The program also empowers the graduates to appear for various competitive examinations or choose the post graduate programme of MSc Computer Science . 9. Understand the nature of the software development process, including the need to provide appropriate documentation. 10. Understand standard techniques for solving a problem on a computer, including programming techniques and techniques for the representation of information.

BCA PROGRAM SPECIFIC OUTCOMES
1.Use and apply current technical concepts and practices in the core computer applications 2.Identify computer application related problems, analyze them and design the system or provide the solution for the problem considering legal, ethical and societal issues. 3.Recognize the need for and an ability to engage in continuing professional development. 4.Work and communicate effectively in interdisciplinary environment, either independently or in team, and demonstrate scientific leadership in academic and industry. 5.Communicate effectively by oral, written, computing and graphical skills and presentation

Student Outcomes

Student outcomes describe what students are expected to know and be able to do by the time of graduation. The Computer Science Department's Bachelor of Science program must enable students to attain, by the time of graduation:

- An ability to apply knowledge of computing and mathematics appropriate to the discipline.

- An ability to identify, formulate, and develop solutions to computational challenges.

- An ability to design, implement, and evaluate a computational system to meet desired needs within realistic constraints.

- An ability to function effectively on teams to accomplish shared computing design, evaluation, or implementation goals.

- An understanding of professional, ethical, legal, security, and social issues and responsibilities for the computing profession.

- An ability to communicate and engage effectively with diverse stakeholders.

- An ability to analyze impacts of computing on individuals, organizations, and society.

- Recognition of the need for and ability to engage in continuing professional development.

- An ability to use appropriate techniques, skills, and tools necessary for computing practice.

- An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computational systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.

- An ability to apply design and development principles in the construction of software systems of varying complexity.

Course Outcome for B.C.A Part-I.(Semester-I)	
1ST1. Computer Fundamentals	
UNIT-I	Able to understand the basic of Computer, like its generation, block diagram of computer and its Types
UNIT-II	Able to understand the hardware Input and Output devices
UNIT-III	Able to understand the use of Various memories used in computer System
UNIT-IV	Study the Number system used in computer with it's conversion and representation.
UNIT-V	Study and understand the basic Programming Concept and Able to implement the algorithms and draw flowcharts

1 ST2. C Programming	
UNIT-I	Able to understand the basic concept of Programming
UNIT-II	Able to understand the Operators and Expressions in C
UNIT-III	Understand the implementations of I/O operations in C
UNIT-IV	Able to implementations Controlled structures in C
UNIT-V	Ability to work with array and pointers

1 ST3. Digital Techniques-I	
UNIT-I	To understand the Number System and logic operations and logic Gates
UNIT-II	To Understand Logical Families
UNIT-III	Able to impliment the Boolean algebra
UNIT-IV	Able to draw and understand Arithmetic logic Unit
UNIT-V	Able to draw and understand Combinational logic Circuit

1 ST4. Numerical Methods	
UNIT-I	Understand the basic concept of Numerical method
UNIT-II	Able to solve the Rounding off errors
UNIT-III	Able to solve the Routs of Equations using Bracketing Methods
UNIT-IV	Able to solve the Routs of Equations using open Methods
UNIT-V	Understand the Solution of Linear Equations

1 ST5.Discreate Mathematics	
UNIT-I	Study the Functions and Relations
UNIT-II	Study the Generating Functions
UNIT-III	Study the Recurrence Relation
UNIT-IV	Study the Boolean Algebra-I
UNIT-V	Study the Boolean Algebra-I

1 ST6.Communication Skill	
UNIT-I	Study the Grammar and Vocabulary
UNIT-II	Study the Language Proficiency
UNIT-III	Study the Forms of written Communication
UNIT-IV	Study the Creative Writing
UNIT-V	Study the Imaginative Approach

Course Outcome for B.C.A Part-I.(Semester-II)	
2ST1. Operating System	
UNIT-I	Able to understand the concept in basic operating system
UNIT-II	Understand the introduction of OS and implement the DOS Commands
UNIT-III	Able to understand the functions of operating system
UNIT-IV	Understand the file management concept
UNIT-V	Able to implement and understand Memory management concept

2 ST2. Advance C	
UNIT-I	Understand the Concept of String Handling
UNIT-II	Understand the function in C
UNIT-III	Understand the structures in C
UNIT-IV	Able to understand the File Handling
UNIT-V	Understand the Random Access and Error handling

2 ST3.Digital Techniques-II	
UNIT-I	To understand the Multivibrators and Flip Flop
UNIT-II	To Understand Counters
UNIT-III	Able to understand the Shift Registers
UNIT-IV	Able to Understand the concept of Memory
UNIT-V	Able to understand the A/D & D/A Converters

2ST4. Numerical Methods	
UNIT-I	Understand the concept of Curve Fitting
UNIT-II	Explain the General Linear Least Squares
UNIT-III	Explain the Interpolation
UNIT-IV	Able to study inverse interpolation
UNIT-V	Able to Numerical Integration
	2 ST5.Discreate Mathematics -II
UNIT-I	Study the Graph Theory(a)
UNIT-II	Study the Graph Theory (b)
UNIT-III	Study the Graph Theory (c)
UNIT-IV	Study the Graph Theory (d)
UNIT-V	Study the Graph Theory (e)

2 ST6.Communication Skill	
UNIT-I	Understand the Comprehension Skill
UNIT-II	Understand the Command over Language
UNIT-III	Understand the Analytical Ability
UNIT-IV	Understand the Drafting Language
UNIT-V	Understand the General awareness

Course Outcome for B.C.A Part-II.(Semester-III)	
3ST1. Data Structure	
UNIT-I	Understand and implementation of algorithm the List, Array and Stacks in data Structure
UNIT-II	Able to understand the Recursion
UNIT-III	Understand implementation the queues and link list
UNIT-IV	Understand the Tree concept
UNIT-V	Able to understand the sorting and searching concept with Algorithm

3 ST2.Object Oriented Programming with C++	
UNIT-I	Understand the basic concept of Object oriented Programming
UNIT-II	Understand the control structure and functions in C++
UNIT-III	Understand the Classes, object and Constructors in C++
UNIT-IV	Understand the Array, Pointers, operator overloading and inheritance
UNIT-V	Able to understand the Virtual Functions and Polymorphism. Understand the File and streams

3 ST3. Data Base Management System	
UNIT-I	Understand the Basic concept of DBMS
UNIT-II	Understand the concept of relational Model
UNIT-III	Understand the Concept of SQL
UNIT-IV	Understand and implement the Functions in DBMS
UNIT-V	Understand the Concept of PL/SQL and Transaction in DBMS

3 ST4. Advance Operating System	
UNIT-I	Understand the Basic concept of Operating System
UNIT-II	Understand the Asynchronous Concurrent Processors
UNIT-III	Understand the concept of Deadlock Indifinite postponement
UNIT-IV	Able to understand the storage management and the virtual storage management
UNIT-V	Understand the Process Management concept

3 ST5. Electronics	
UNIT-I	Able to study the 8085 microprocessor and also study Block diagram and Pin diagram
UNIT-II	Able to perform Instruction and programming of 8085
UNIT-III	Understand the concept of Interfacing
UNIT-IV	Abe to understand the 8086 Architecture
UNIT-V	Able to perform Instructions and programming of 8086

Course Outcome for B.C.A Part-II.(Semester-IV)	
4ST1. System analysis design & MIS	
UNIT-I	Understand the basic of System analysis and Design
UNIT-II	Able to understand the Project management
UNIT-III	Able to study the system design Understand files and databases
UNIT-IV	Able to study the MIS and Decision making with MIS
UNIT-V	Study the information system planning

4 ST2. Visual Basic	
UNIT-I	Study and implement the basic concept of VB
UNIT-II	Implement the Object and Classes in VB
UNIT-III	Implement the study the internal functions in VB
UNIT-IV	Study and implement the Working with forms
UNIT-V	Study and implement the concept of Files

4 ST3. Web Designing and office Automation	
UNIT-I	Study the application, infrastructures in IT
UNIT-II	Able to study the implementation of EXCEL
UNIT-III	Able to study the implementation of ACCESS
UNIT-IV	Able to study the implementation Web publishing concept and E-Commerce
UNIT-V	Understand the Web page Construction with help of HTML-4 Study the pointshop pro

4 ST4. Networking	
UNIT-I	Understand Networking Concept such as Topology, LAN ,WAN, OSI model
UNIT-II	Study the digital and analog data Communication
UNIT-III	Understand the data link protocol and network layer
UNIT-IV	Understand the LAN, WAN FDDI
UNIT-V	Understand Communication services and network security

3 ST5. Advance Microprocessor and Microcontroller	
UNIT-I	Understand the 80286 and instruction
UNIT-II	Able to study 80386, 80486 and 80586 microprocessor
UNIT-III	Study the Microcontroller
UNIT-IV	Understand the 8051 instruction set and arithmetic and logical instruction
UNIT-V	Study the 8051 interfacing & Application

Course Outcome for B.C.A Part-III.(Semester-V)	
5ST1. Core Java	
UNIT-I	Study the Introduction to java
UNIT-II	Study the and implement the Classes and inheritance
UNIT-III	Study the and implement the Packages and interfaces
UNIT-IV	Study the and implement the Exception handling and threads
UNIT-V	Study the and implement the Applet, AWT, Input, output stream

5ST2. Network Security	
UNIT-I	Understand the Introduction to network security
UNIT-II	Understand the Block ciphers and data Encryption standard
UNIT-III	Understand the Finite field
UNIT-IV	Understand the Public key cryptography & RSA
UNIT-V	Understand the Security in NS

5ST3. Software Engineering	
UNIT-I	Understand the Introduction to software engineering
UNIT-II	Understand the Software Project management concept
UNIT-III	Understand the System design
UNIT-IV	Able to understand Structured programming
UNIT-V	Able to understand Software quality management

5ST4. Computer Graphics	
UNIT-I	Study the introduction to computer Graphics
UNIT-II	Study the Geometrical Transformations
UNIT-III	Understand the Drawing Algorithms
UNIT-IV	Study and understand Animation
UNIT-V	Study the Implementation

3 ST5. E-Commerce	
UNIT-I	Understand the basic concept of E-Commerce
UNIT-II	Able to understand Business strategy in an Electronic Age
UNIT-III	Able to understand Business strategy implementation
UNIT-IV	Able to understand Business-to-Business electronic Commerce
UNIT-V	Able to understand Electronic payment System

Course Outcome for B.C.A Part-III.(Semester-VI)	
6ST1 :-.NET using ASP	
UNIT-I	Able to understand the basic of ASP.NET
UNIT-II	Able to develop the ASP.NET application
UNIT-III	Understand the concept of C#
UNIT-IV	Able to deal with database in ADO.NET
UNIT-V	Understand the Advance concept of ASP.NET

6ST2 : Client Server Technology	
UNIT-I	Understand the Client Server Technology
UNIT-II	Understand the basic concept with programming language
UNIT-III	Able to learn Scheduling Implementation and synchronization
UNIT-IV	Able to understand the Semaphores and its implementation in Novell network And Windows NT , Unix O.S. memory management
UNIT-V	Able to deal with oracle and its tool

6ST3 Multimedia and its application	
UNIT-I	Study the introductory concept of multimedia
UNIT-II	Study the Multimedia Various Software
UNIT-III	Understand the Building Blocks
UNIT-IV	Understand the Production Tips
UNIT-V	Study the multimedia Project Development and case study

6ST4 : software Testing	
UNIT-I	Study principles of software testing
UNIT-II	Study white box testing
UNIT-III	Study integration testing and its application
UNIT-IV	Study acceptance testing and its application
UNIT-V	Study regression testing and its application

6ST5 Advance Database Management System	
UNIT-I	Study the basic of Database with file organization
UNIT-II	Study the concurrency control transaction and crash Recovery
UNIT-III	Study Parallel and distributed database and its application
UNIT-IV	Understand the concept of Object oriented database system
UNIT-V	Study Data Warehousing

Adarsha Science J B Arts & Birla Commerce Mahavidyalaya, Dhamangaon Rly

Department of Botany

B.Sc. Botany

A. Programme Outcomes

PO1. Critical Thinking: Apply the knowledge of botany to make scientific queries and enhance the comprehension potential.

PO2. Effective Communication: Successful transfer of scientific knowledge both orally and in writing. **PO3.** Social Interaction: Function as an individual, as a member or a leader to perform a task in class room situation or during field study and at the time of social gatherings.

PO4. Effective Citizenship: Responsible for learning, develop honesty in work and respect for self and others and responsible towards nature.

PO5. Ethics: Convey and practice social, environmental and biological ethics which is now a days very burning issue of the entire world.

PO6. Environment and Sustainability: Maintain the significance of conserving a clean environment for endurance and sustainable development.

PO7. Self-directed and Life-long Learning: study unremittingly by self to cope with growing competition for higher studies and employment.

B. Programme Specific Outcomes

PSO1. Educate students in and around Dhamangaon Railway District Amravati, a prime area of Satpura Range, about plant science.

PSO2. Inculcate strong nitty-gritties on contemporary and traditional aspects of Botany.

PSO3. Build life skills in Edible mushroom cultivation, Biofertilizer production, Gardening and its maintenance followed by seed bank.

PSO4. Create platform for higher studies and research in Botany.

PSO5. Enable students to take-up efficacious career in Botany.

C. Course outcomes

Sr No	Semester	Name of the Course	Course Outcomes
1	SEM I	Diversity & Applications of Microbes and Cryptogams	1. Discuss about importance of morphological structure, classification, reproduction and economic importance of Algae. 2. Study and impart knowledge about the general Characteristics, structure, reproduction, life history and economic importance of fungi. Understand the features of Lichens. 3. Know the control measures of plant diseases. 4. Students able to explain about structure, classification, reproduction, life cycle and economic importance of Bryophytes.
1		Laboratory Exercise	1. Learn the microscopic technique, familiarize with the external and internal structure of lower and higher group organisms. 2. Study of Lichens and its types. Study of plant diseases causal organisms, and control measures. 3. Study of mushroom cultivation process.
2	SEM II	Gymnosperm, Morphology of Angiosperms and Utilization of Plants	1. Study and impart knowledge about the Structure, reproduction, life cycle, fossil, fossilization and geological time scale. 2. Students able to explain about structure, classification, reproduction, life cycle and economic importance of Gymnosperms. 3. Study and impart knowledge about the Structure, reproduction, life cycle, fossil, fossilization and geological time scale. 4. Students able to explain about structure,

			classification, reproduction, life cycle and economic importance of Gymnosperms. 5. Diversity in Plants habits. Understand different systems of traditional medicines 6. Acquire knowledge on collection and processing of herbal drugs 7. Get knowledge on pharmacological importance of medicinal plants and its bioactive compounds 8. Acquire knowledge on different adulterants.
		Laboratory Exercise	1. Study of gymnosperm morphology, anatomy, and economic importance of gymnosperms. 2. Learn about Double stained permanent mount preparation of gymnosperm plant material 3. Learn about fossils 4. Study of morphology and modification of plants. 5. Learn about pharmacology and pharmacognosy along with morphology of medicinal plants.
3	SEM III	Plant Systematics, Anatomy & Embryology	1. Student will able to study nomenclature of the plant in scientific way according to different taxonomic classifications. 2. Learn about rules for plant nomenclature by ICBN 3. Plant anatomy and embryology are much awaited subject to study the internal structures & function of reproductive organs in plants. 4. The course paper cover basic aspects of anatomy of plant tissues such as meristems, epidermis, permanent tissues, complex tissue systems and structure of plant organs;

			reproductive developmental aspects of male reproductive system - Pollen grains, female reproductive system - embryo sac. 5. Students will be benefitted by studying the plant anatomy enables to identify scrappy plant materials, wood, forensic investigation, and applied aspects of meristems cultures. 6. Students will be able to utilize embryological studies in various aspects like analysis of evolutionary trends, circumscription and delimitation of taxa and making a decision on systematic positions.
		Laboratory Exercise	1. Observation of wide range of flowers available in the locality and methods of their pollination. 2. Students came to know fundamentals of embryology through the study of permanent slides. 3. Hands on training for the students about microscope handling and understanding the hidden world of embryology. 4. Description plants belongs to different families in technical language. 5. Students could identify plants in a scientific way up to family level.
4	Sem IV	Cell Biology, Genetics and Biochemistry	1. Acquire knowledge on ultrastructure of cell. 2. Understand the structure and chemical composition of chromatin and concept of cell division. 3. As a part of classical genetics, students learned about the Mendel's principles, acquire knowledge on cytoplasmic inheritance, Linkage and sex-linked inheritance. 4. Learned about crossing over mechanism

			5. Understand the concept of 'one gene one enzyme hypothesis' along with molecular mechanism of mutation. 6. The student Acquires a general knowledge of the physical, chemical properties and metabolism of carbohydrates and lipids in living system. 7. The student knows basic knowledge of the biological importance of the biomolecules such as carbohydrates, lipids, protein, nucleic acid and enzymes. 8. The students will be able to understand the fundamental biochemical principles of enzymes, such as the structure and function of enzymatic process and its classifications in living system.
		Laboratory Exercise	1. Students learn about process of Isolation of mitochondria and chloroplast 2. Squash and Smear technique helped students to learn about most fundamental part of the life doing observations of various stages of cell division that are Mitosis & meiosis 3. New way to learn and prove the Mendel's lows performing practical based on probability. 4. By performing different tests students came to know about different types and specificity of enzymes.
5	SEM V	Plant Physiology and Ecology	1. To become knowledgeable in plant and its water relations. 2. Students will able to gain knowledge on role of micronutrients in plant growth, their development and understand the mechanism of nitrogen metabolism. 3. To gain knowledge about chloroplast structure, photosynthetic pigments, the path

			of energy from the light reactions through Calvin cycle.
			4. Students are able to understand the process of translocation of organic solutes in plants.
			5. To understand the energy releasing steps in Glycolysis. Students will be familiar about the mechanism of respiration.
			6. To acquire knowledge in plant growth regulator and its uses, understand the physiology of flowering and photoperiodism.
			7. Students learned about the interaction between biotic and abiotic components of the environment.
			8. Know about the concept of energy flow in the ecosystem.
			9. Students will acquire knowledge regarding vegetation and its analysis.
			10. Know about different pollutions, consequences in the environment and its justification.
			11. Students will know about the floristic regions and plant formation of the planet.
			12. Students will deepen the vegetation types of Melghat Region. (Type of Dry Tropical deciduous forest)
		Laboratory Exercise	1. Learned about physiological experiments like paper chromatographic method
			2. Study of osmosis phenomenon by plasmolytic method
			3. Students will study and understand how water travel from soil to the top most portion of the plants by studying ascent of sap
			4. Physical factors affect permeability of bio

			membranes will be studied by students using laboratory exercise
			5. Students will come to know about effect of light CO2 and other factors affecting the rate of photosynthesis.
			6. Study morphology in concern about adaptations of plants in different ecological conditions.
			7. Students can study population dynamics by studying quadrat method.
6	SEM VI	Molecular Biology and Biotechnology	1. Plant Molecular Biology focuses on exploration of molecular basis of plant life.
			2. The course paper enlightens mainly on DNA, RNA, Protein, molecular systems and regulation of gene expression in prokaryotic and eukaryotic organisms.
			3. Through this course paper students will be able to understand the function of cells at molecular level.
			4. The students will be able to apply the molecular knowledge in metabolic engineering of transgenic plant to produce biologically important products.
			5. Students will be able to pertain knowledge on molecular breeding methods that are coupled with genetic engineering techniques
			6. Understand the basic principles of plant tissue culture along with its application like micropropagation and synthetic seed production.
		Laboratory Exercise	1. The practical course paper elaborates fundamental skills and techniques in plant molecular biology.
			2. It contains more experiments based on

			general and applied aspects. 3. These experiments will be helpful to student for better understanding of the scientific principles and skilful implementation of the experiments. 4. Students enable to familiarize about the preparation of solutions of different strength. Ex. Buffer. 5. Student will be able to utilize all basic instruments used in molecular biology. 6. Isolation, quantification and storage methods of DNA will be helpful to students to carry out advanced studies like genetic engineering.

Adarsha Science, J. B. Arts and Birla Commerce Mahavidyalaya, Dhamangaon Rly.

Department of Chemistry

Programme out comes, programme specific outcome and Course out comes

Programme outcome
After graduating from science faculty, a student is able to:

PO1	**Critical thinking and scientific knowledge** • Employ critical thinking and the scientific knowledge of chemistry to try design, carry out chemical reactions, record and analyse the results of chemical reactions. • Understood the basic concepts, fundamental principles, and scientific theories based on various scientific phenomenons in chemistry and their applications in life activities. • Acquired expert skills in handling and operating the laboratory instruments, performing laboratory oriented experiments, highlight significant observations and deduce the logical conclusions based on facts and findings.
PO2	**Awareness** • Create an awareness of the impact of chemistry on the environment, society, and development outside the scientific community. • Create an awareness of the importance of chemistry as central subject to undertake higher studies.
PO3	**Effective and Social Communication** • Developed various relational abilities, for example, composing, perusing, tuning in, talking, and so forth, which will in the end help in

	communicating, thoughts and cognitive perspectives obviously and adequately.
	• Developed an aptitude for partaking in different socio-social exercises with excitement, to scatter the seeds of information and contribute in making mindfulness about the social legends, mistrusts.
PO4	**Effective Citizenship** • Developed a patriotic and disciplined citizen to address complex local, national and global issues, cultural and religious conflict. • Developed with undoubted sense of their rights and responsibilities as citizens.
PO5	**Ethics** • Imbibed science oriented ethical, moral and social values in personal and social life leading to highly cultured and civilized personality.
PO6	**Environment and Sustainability** • Understand the need of rational use of natural resources and their alternatives and be aware of waste treatment, reduction in carbon footprint and production of reusable and recyclable materials for sustainable environment.
PO7	**Self-directed and Life-long Learning** • Vibrant knowledge achieved in combination with positive attitude and energetic effort has the potential to undertake the self learning and life lasting association with scientific approach in the context of chemical science.

	Programme specific outcome
PSO 1	Gain the knowledge of Chemistry through theory and practical's.
PSO 2	Understand nomenclature, stereochemistry, structures and reactivity of chemical compounds and mechanism of the chemical reactions, derivations and important theories.
PSO 3	Explain mechanism of organic reactions.
PSO 4	Explain properties of elements through periodic table.
PSO 5	Understand the applications of organic and inorganic compounds.
PSO 6	Identify chemical formulae and solve numerical problems.
PSO 7	Use modern chemical tools, Models, Charts and Equipment's.
PSO 8	Explain structure-activity relationship, basic fundamental theories.
PSO 9	Understand good laboratory practices and safety measures performing in the laboratory.
PSO 10	Demonstrate fundamental experiments of chemistry and develop research oriented skills in laboratory.
PSO 11	Analyse the compounds at elementary level on the basis uv- visible, IR, and NMR spectroscopic techniques.
PSO 12	Make aware and handle the sophisticated instruments/equipments and chemicals.
PSO 13	Understand derivations of thermodynamics, laws of photochemistry, kinetics of chemical reactions, electrical and magnetic properties of compounds and properties of dilute solutions.

Course outcomes
B. Sc. I - Semester I

Inorganic Chemistry

CO 1	Define the periodic properties like atomic and ionic- radii, Van der Waal's radius, and ionization energy.
CO 2	Able to know the effect of ionization energy and electronegativity on the different properties of elements scales of electronegativity, Screenings effects and effective nuclear charge.
CO 3	Discuss the Slater's rules and calculating the Screening constant and solve problem based on it, factors affecting ionic bond formation, Born Lande equation and Born-Haber's cycle to calculate lattice energy.
CO 4	Understand the terms Screenings effects, screening constant and effective nuclear charge, solvation and solvation energy.
CO 5	Detail and comparative study of S-block and P-block elements.
CO 6	Understand the concept of inert pair effect, abnormal behaviour of nitrogen, hydrides of boron and their preparation, properties, diagonal relationship of elements like Li – Mg, Be-Al.
CO 7	Analyse acidic and basic radical from a given mixture by semi-micro qualitative analysis method.

Organic Chemistry

CO 1	Define and discussion on the different terms involved in electronic displacements e.g.Inductive effect, Electromeric effect, Resonance and Hyperconjugation effect and their applications.

CO 2	Study the reactive intermediate like carbocation, carbanion and free radicals. Discuss their generation stability and reactions.
CO 3	Know about aliphatic and aromatic hydrocarbons, important name reactions, E1 and E2 reactions, Huckel's rules of aromaticity and the various substitution reactions.
CO 4	Prepare various organic compounds by using different methods.

Physical Chemistry

CO 1	Understand adiabatic and isothermal processes in thermodynamics, first law of thermodynamics and its limitations, Carnot's engine, concept of entropy.
CO 2	Solve the numericals after discussion on thermodynamics.
CO 3	Know the postulates of kinetic theory of gases, derivation of kinetic gas equation, Maxwell-Boltzmann distribution law of molecular velocities.
CO 4	Come to know the deviation of real gases from ideal gas behaviour. Van der Waal's equation of state and its derivation for real gases.
CO 5	Understand Statement of phase rule, explanation of phase, number of components and degree of freedom and its applications.

Course outcomes
B. Sc. I - Semester II
Inorganic Chemistry
CO 1   Discuss the term polarization, polarizing power, polarizability, effect of polarization on nature of bond, Fajan's rules of and its applications, structure and bonding in diborane, carbides, types of carbides and fullerenes.

CO 2	Study the aspects of hybridisation, types of hybridisation to explain geometries of NH_4^+ ion, PCl_5, SF_6 and IF_7, Lux-Flood concept of acids and bases, structure and bonding in diborane, carbides, types of carbides and fullerenes.
CO 3	Know the term hard and soft acids and bases and discuss the Pearson's HSAB or SHAB principle with important applications.
CO 4	Understand the comparative study of P-block elements with reference to electronic configuration, ionization energy and oxidation states, interhalogen compounds.
CO 5	Define the term noble gases, Study of their compounds with respect to their structure and bonding e.g. XeF_2, XeF_4, XeF_6, XeO_3 and XeO_4, non aqueous solvents and requirements of a good solvent.
CO 6	Discuss the physical properties of solvents namely liquid range, dielectric constant, dipole moment, heat of vaporisation and solubility behaviour.

Organic Chemistry

CO 1	Able to understand alkyl halide, aryl halide and alcohol, their synthesis, chemical and physical properties, pinacol - pinacolone rearrangement.
CO 2	Come to know the structure, molecular formula, synthesis chemical and physical properties of phenol, ether and epoxide.
CO 3	To do complete analysis of simple organic compounds containing one or two functional groups.

Physical Chemistry

CO 1	Able to understand electrical and magnetic properties
CO 2	Understand the rate of reaction, order of reactions and their units, half-life period of a reaction.
CO 3	Able to understand determination of order of a reaction by integration, graphical,

	equifractional change, Vant Hoff's differential method and Ostwald's isolation method.
CO 4	Able to solve the numerical after discussion of chemical kinetics, Arrhenius equation, activation energy and its determination using Arrhenius equation.
CO 5	To determine physical properties like surface tension, viscosity, cleaning power of detergent, percentage composition of given ethanol-water mixture by viscometer, activation energy of a reaction, and heat of solution.

Course outcomes	
B. Sc. II - Semester III	
Inorganic Chemistry	
CO 1	Understand the concept of covalent bonding, metallic bonding and VSEPR theory.
CO 2	Understand postulates of molecular orbital theory, LCAO approximation, formation of bonding and anti-bonding MOs and rules for LCAO. M O energy level diagram.
CO 3	Come to know MO structure of homonuclear diatomic molecules namely He_2 , H_2 , N_2 and O_2 and heteronuclear diatomic molecules like NO, HF and CO
CO 4	Know various rules under VSEPR theory to explain molecular geometry.
CO 5	Able to understand different theory of quantitative Inorganic analysis like volumetric and gravimetric Analysis.
CO 6	To perform analysis of a components volumetrically.

CO 7	To perform analysis of a components like Ba^{2+} as $BaSO_4$, Fe_3^+ as Fe_2O_3 gravimetrically.

Organic Chemistry

CO 1	Understand the synthesis, chemical and physical properties of aldehydes and ketones, various naming reactions and its mechanisms.
CO 2	Know the structure and reactivity of carboxylic acids, its acidity, acid strength, chemical reactions and physical properties of carboxylic acids.
CO 3	Understand an optical isomerism, geometrical isomerism conformational isomerism.
CO 4	Understand element of symmetry, chirality, asymmetric carbon atom, enantiomers, diastereomers, relative and absolute configurations, DL and RS nomenclature, racemisation and resolution.
CO 5	Understand the Cis-trans & E-Z nomenclature, Bayer's Strain theory and Newman & Sawhorse projection formulae.

Physical Chemistry

CO 1	Know the terms Gibb's and Helmholtz's free energy function, Gibb's-Helmholtz's equation in terms of G and its application, Partial molar function, derivations of Gibb's-Duhem equation, Vant Hoff's isotherm and its application to equilibrium state.
CO 2	Solve the numerical after discussion on problems of thermodynamics and phase equilibrium.
CO 3	Discuss the immiscible liquids, Nernst distribution law and its application to association and dissociation of solute in one of the solvent.
CO 4	Derive Clausius-Clyperon equation, partially miscible liquids - Phase diagram of phenol-water, triethyl amine - water and nicotine-water systems.

CO 5	Understand the terms surface tension, viscosity and its determination and its S.I. Unit. Effect of temperature on surface tension and viscosity.
CO 6	Understand the terms involved in electrochemistry like conductance, Specific Conductance, equivalent and molar conductance.
CO 7	Understand conductometric titrations, applications of conductometric titration, transport number and its determination by Hittorf's method and Moving boundary method and Kohlrausch's law of independent migration of ions.
CO 8	To construct phase diagram of phenol-water system and to determine consulate temperature for the system.
CO 9	To determine transition temperature, study kinetics of hydrolysis of methyl acetate catalysed by acid and kinetics of saponification of ethyl acetate by NaOH.
CO 10	Determine partition coefficient of iodine and solubility of benzoic acid at different temperature.

Course outcomes
B. Sc. II - Semester IV

Inorganic Chemistry

CO 1	Understand the Chemistry of elements of transition series (3d, 4d and 5d) with respect to their Electronic configuration, Atomic and ionic size, Ionization energy, Metallic nature, Oxidation states, Magnetic properties, Colour of salts, Catalytic properties and Complex formation behaviour.
CO 2	Come to know principles involved in extraction of elements, methods of extraction of elements and factors affecting choice of extraction method.

CO 3	Understand the thermodynamics of reduction processes-Ellingham diagrams for oxides.
CO 4	Understand Lanthanides and Actinides and their comparative study with respect to different properties.
CO 5	Understand definition of metallurgy, steps in metallurgy. Ore dressing by gravity separation, froath floatation and electromagnetic separation. Calcination, roasting, smelting and refining of metals.
CO 6	Estimate Zn(II) by complexometric titration, hardness of water by complexometric titration and Cu(II) in commercial copper sulphate by colorimetrically or spectrophotometrically.
CO 7	Perform chromatographic separation of Cu(II), Co(II) and Ni(II) ions by paper chromatography
CO 8	Determination the concentration of unknown $KMnO_4$ solution from standard solutions of $KMnO_4$ by colorimetrically.

Organic Chemistry

CO 1	Know the concept of polynuclear hydrocarbons e.g. napthalene, its structure, preparation and chemical reactions.
Co 2	Know the concept of reactive methylene compounds, synthesis and application of malonic ester and acetoacetic ester.
CO 3	Understand carbohydrate, its constitution and epimerization.
CO 4	Understand structure, synthesis, reactivity and applications of aromatic nitro compounds, amino compound, diazonium salts, amino acids and proteins.
CO 5	Know the terms like Zwitterion, isoelectric point etc.
CO 6	Perform isolation of casein from milk, nicotine from tobacco leaves, caffeine from tea leaves and lycopene from tomato juice.

CO 7	Estimate glucose, acetamide and can determine the equivalent weight of an organic acid.

Physical Chemistry

CO 1	Come to know different colligative properties of dilute solutions and Van't Hoff's factor.
CO 2	Understand the overall idea about crystalline state, symmetry in crystal, laws of symmetry and Weiss and Miller indices.
CO 3	Understand seven crystal systems and fourteen Bravais lattices, derivation of Bragg's equation for X-ray diffraction and Bragg's X-ray spectrometer method for the determination of crystal structure of NaCl and KCl.

Course outcomes
B. Sc. III - Semester V

Inorganic Chemistry

CO 1	Understand the basic terms in coordination chemistry.
CO 2	Understand the concept of Werner's and Sidgwick's electronic theory in coordination compounds, nomenclature, structure, geometry, and optical isomerism of various coordination compounds.
CO 3	Gain the knowledge of valence bond theory and magnetic properties.
CO 4	Gain the depth knowledge of chelates, its applications in analytical chemistry and understand the concept of stability of chelates.
CO 5	Acquire the knowledge about basic concept of crystal field theory, crystal field

	splitting in octahedral, distorted octahedral, square planar and tetrahedral complexes and energy in high spin and low spin complexes.
CO 6	Gain the depth knowledge of electronic spectra of transition metal complexes, types of absorption spectra and selection rules for d-d transitions and spectrochemical series.
CO 7	To prepared tetraamminecopper(II)sulphate, hexaamminenickel(II)chloride, potassiumtrioxalate aluminate(III), Prussian blue, chrome alum, sodium thiosulphate and dithionite.

Organic Chemistry

CO 1	Know the importance and applications of heterocyclic compounds.
CO 2	Learns the nomenclature of five and six membered heterocyclic compounds.
CO 3	Understand the various methods of synthesis of heterocyclic compounds and their electrophilic & nucleophilic substitution reactions.
CO 4	Understand the chemistry of organometallic compounds (organomagnesium and organolithium compounds).
CO 5	Understand the classification of dyes on the basis of structure and mode of applications.
CO 6	Learns the synthesis, properties and applications of various dyes.
CO 7	Learn about analgesic and antipyretic drugs.
CO 8	Understand the importance of pesticides, classification of pesticides such as insecticides, herbicides, fungicides and rodenticides and their synthesis.

Physical Chemistry

CO 1	Acquire good knowledge of photochemical and thermal reactions.

CO 2	Understand the principle and laws of photochemistry and difference between thermal and photochemical reactions.
CO 3	Understand the laws of absorption of light (Lambert's law and Beer's law) and applications of Beer's-Lamberts law.
CO 4	Understand the concept of quantum yield and kinetics of photochemical decomposition.
CO 5	Understand the Joblonski diagram and the terms involved such as singlet, triplet, internal conversion, inter-system crossing, fluorescence, and phosphorescence.
CO 6	Know chemiluminescence and bioluminescence.
CO 7	Gain the Knowledge of electromagnetic radiation spectrum, various types of spectra and degrees of freedom.
CO 8	Understand rotational (microwave), vibrational, and Raman spectroscopy with their selection rules.
CO 9	Determine strength of given HCl solution conductometrically, strength of given CH_3 COOH solution conductometrically, strength of HCl solution potentiometrically, strength of HCl and CH_3 COOH in a given mixture conductometrically, redox potential of Fe^{+2}/Fe^{+3} system potentiometrically, molecular weight by Rast's method and specific rotation of optically active compound by Polarimeter.

Course outcomes
B. Sc. III - Semester VI

Inorganic Chemistry

CO 1	Understand the thermodynamic and kinetic stability of the complexes, factors which affect the stability of complexes and stability of labile and inert complexes.
CO 2	Gain the brief idea about substitution reactions, SN^1-dissociative and SN^2-associative mechanism, substitution reactions in square planer complexes and its mechanism and concept of molar extinction coefficient.
CO 3	Understand the technique of colorimeter and spectrophotometer with its components and their applications.
CO 4	Understand the theory, principle classification and applications of chromatography technique.
CO 5	Understand the classification, nomenclature, methods of preparation, properties and reactions of organometallic compounds.
CO 6	Understand the structure of carbonyls on the basis of valence bond theory and effective atomic number in metal carbonyls.
CO 7	Learn the classification of inorganic polymers on the basis of nature of monomers and types of reaction and synthesis and applications of various polymers.
CO 8	Understand the terms essential and non-essential elements in biological process.
CO 9	Gain the knowledge about metalloporphyrins and role of hemoglobin and myoglobin in oxygen transport.

Organic Chemistry	
CO 1	Understand electromagnetic radiations.
CO 2	Understand the principle and instrumentation of spectrophotometer.
CO 3	Learn the terms used in uv - visible spectroscopy and understand the importance of uv - visible spectroscopy for the elucidation of structure of organic compounds.
CO 4	Understands IR spectroscopy and NMR spectroscopy and their applications to characterize the organic compounds.
CO 5	Gain the knowledge of mass spectrometry.
CO 6	Estimate formaldehyde, glycine, ascorbic acid (vitamine C), phenol by bromination method, aniline by bromination method, urea by hypobromite method, unsaturation by bromination method and equivalent weight of an ester by saponification reaction.
CO 7	Separate a mixture of methyl orange and methylene blue by thin layer chromatography (using benzene), mixture of 2,4-dinitro phenyls of acetaldehyde and benzaldehyde by thin layer chromatography, mixture of dyes by thin layer chromatography, mixture of 2,4-dinitro phenyls of acetaldehyde and benzaldehyde by thin layer chromatography.
Physical Chemistry	
CO 1	Able to understand the Plank's quantum theory, Photoelectric effect and Compton Effect.
CO 2	Know de Broglie hypothesis of matter waves, de Broglie's equation and Heisenberg's uncertainty principle. Classical wave equation and Schrodinger's wave equation in one-dimension.
CO 3	Understand the physical significance of wave function and application of

	Schrodinger wave equation to a particle in one- dimensional box and its extension to a three-dimensional box. Concept of atomic orbital.
CO 4	Know the terms used in electrochemistry, types of electrodes. Determination of pH of the solution using hydrogen, quinhydrone and glass electrodes.
CO 5	Understand the concept used in nuclear chemistry like Shell model of a nucleus - Assumptions, evidences for existence of magic numbers and liquid drop model
CO 6	Know the types of nuclear reactions, applications of radio isotopes in industry, agriculture, medicines and bio-sciences.
CO 7	Determine dissociation constant of weak acid by conductometry, dissociation constant of weak acid by potentiometry, dissociation constant of dibasic acid by pH-metry, pH of a soil sample by pH-meter and solubility and solubility product of sparingly soluble salts conductometrically.
CO 8	Do titration of strong acid and strong base by pH-metry and potentiometric titration of KCl and $AgNO_3$.

Department of Commerce

Programme Outcome:

- To provide well versed and trained human resource to meet the requirements of the industry in the fields of Accountancy, Taxation, Banking, Insurance, marketing, e-commerce, international economics & research.
- To impart and develop the oral and written communication, Information Technology, statistical skills & legal knowledge.
- To develop and inculcate entrepreneurial skills among the students.
- To prepare students to adapt latest trends by engaging lifelong learning to pursue higher studies / succeed in employment in the field of business.

Programme Specific Outcome:

- After successful completion of B.Com. Degree, a student should have-
- Knowledge and set of skills to meet the challenges of industry with an ease.
- Understanding and the knowledge applying mathematical tools and techniques for research in field of Commerce.
- Mastered practical skills to work as accountant, audit assistant, tax consultant, and computer operator. As well as other financial supporting services.
- Ability to used communication skills in the field of business.
- An understanding of professional & ethical responsibility.

Course Outcomes

B. Com First Year Semester I

Course/ Subject : **Advance Accountancy**

Course/ Subject : ADVANCE ACCOUNTANCY	
CO1	To understand Basis Terms and Concept of Book Keeping and Accounting
CO2	To understand Accounting cycle and primary and secondary books of Account
CO3	To understand, how to prepare the trial balance & Final Account
CO4	To understand various types of error and its rectification
CO5	To understand How to prepare the Final Account of Individuals
CO6	To understand concept of Depreciation , it's types and Accounting
CO7	To understand concept of Bank Reconciliation Statement and How to prepare the Bank Reconciliation Statement
Course/ Subject: PRINCIPLES OF ECONOMICS	
CO1	To Understand the concepts of economics and its usefulness in real life situation.
CO2	To Understand the importance of Law of Demand, Theory of Utility in business.
CO3	To understand the concepts, nature of production and its relationship to Industry.
C04	To Understand the various concepts of cost and its application in industry.
Course/ Subject: PRINCIPLES TO BUSINESS ORGANISATION	
CO1	On successful completion of this subject the learners would acquire the knowledge about the various facets of business.
CO2	To know the Meaning, Scope and Evolution of Commerce and Industry, Industrial Revolution- Its Effects
CO3	The learners would gain in-depth insights of conduct of business & basics of business management.
C04	To learn the procedure of Import – Export Trade
C05	To understand the concept of BPO's and KPO's, Patents, Trademarks, Copyrights, Networking of Business

Course/ Subject: COMPUTER FUNDAMENTAL AND OPERATING SYSTEM Semester I & II	
CO1	To provide computer skills and knowledge for commerce students
CO2	To make students familiar with computer environment & operating systems
CO3	To provide understanding of the principles and working of the hardware and software aspects of computer systems.
CO4	To provide the basic knowledge of MS Word, Windows

B. Com First Year Semester II

Course/ Subject : FINANCIAL ACCOUNTANCY	
CO1	To understand concept of Non-Profit organization , Receipts & Payment Account, Income & Expenditure Account & Balance Sheet
CO2	To understand concept of Cooperative Society & Prepare Final Account of Cooperative Society as per Maharashtra State Cooperative Society Act 1960.
CO3	To understand concept of Agriculture Farm Accounting and Preparation of Final Account of Agriculture Farm
CO4	To understand concept of Hire Purchase and Installment & difference between Hire Purchase & Installment and its Accounting Procedure
CO5	To understand various concept of Insolvency , Law of Insolvency, Procedure of Insolvency
Course/ Subject: BUSINESS ECONOMICS	
CO1	To Understand the application of economics theory & principles in the field of business.
CO2	To understand the various market structure and their working mechanism.
CO3	To Understand the used of price determination under various market structure.
C04	To understand the factor pricing theories and its application in business.
Course/ Subject: PRINCIPLES TO BUSINESS MANAGEMENT	
CO1	The students will come to know the concept & importance of Management.
CO2	To understand the Concept, Nature and Importance of Planning

CO3	To know the Concept, Nature & Principles of Organization.
C04	To learn the Concept, Meaning and Importance of Motivations
C05	To apply the Tools, techniques & Process of Controlling

B. Com Second Year Semester III

Course/ Subject : **Business Mathematics and Statistics**	
CO1	To develop Quantitative Aptitude among the students
CO2	To develop Competitive Examination Awareness through Minimum Knowledge of Mathematics
CO3	To Provide basic knowledge of day to day business activity through Discount, Commission and Brokerage, Average, Profit & Loss, Simple Interest Problems
CO4	To understand meaning of Statistics in various Aspects.
CO5	To understand concept of Presentation of Data & it's Methods
Course/ Subject: **Monetary System**	
CO1	To understand the money and its various types & importance of money in the economy.
CO2	To Explain the value of money and its importance.
CO3	To understand the concepts of inflation and deflation & various phases of Trade cycle.
C04	Explain the functions money market, capital market and stock market
Course/ Subject: **Company Accounting**	
CO1	Understanding and implementation of business transactions of business into practical accounting.
CO2	To understand the concept of Issue, forfeiture and Re-issue of Shares.

CO3	To provide knowledge about the practical Final Accounts of company comprising Trading, Profit & Loss Account & Balance sheet.
CO4	To learn the Amalgamation, absorption of Company

Course/ Subject: **Auditing**

CO1	Apply critical thinking skills and solve auditing problems.
CO2	To understand the Concepts of dividend and types of dividend
CO3	To articulate knowledge of Fundamental Audit concepts
CO4	To understand the concept of Internal Check System, Audit Program, Routine Checking and Vouching Verification and Valuation of Asset and Liabilities
CO5	

Course/ Subject: INFORMATION TECHNOLOGY AND BUSINESS DATA PROCESSING
Semester III & IV

CO1	To enhance the students' understanding of usefulness of information technology tools for business operations
CO2	To Discuss the System, Design and Database Management in MIS.
CO3	To learn the basics of Spreadsheet, how to use and apply Excel and Excel add-ins to solve business problems:
CO4	Apply formulas and functions in Spreadsheet for Accounting, Statistical and Business purposes.
CO5	Use Spreadsheet in business reporting which will assist in decision making
CO6	To Provide basic knowledge of Tally to handle business transaction

B. Com Second Year Semester IV

Course/ Subject : **Income Tax**	
CO1	To articulate knowledge of Fundamental Income Tax concepts
CO2	To apply critical thinking skills and solve Income Tax Problems
CO3	To apply knowledge of tax for computation of income from salary, house property and from other source and e-filling Procedure of Return of Income
CO4	To enhance understanding Tax Planning, Advance Tax, Permanent Account Number (PAN) & Tax Deduction at source (TDS)
CO5	To gain knowledge about Structure of income Tax Authority & their

	powers

Course/ Subject: **Indian Financial System**	
CO1	To understand the Indian financial system and importance in Indian economy.
CO2	To understand the Indian banking and various concepts of banking.
CO3	To explain various function of central bank, commercial bank and there importance in the economy.
C04	To explain functions of stock market & its importance in the economy.

Course/ Subject: **Corporate Accounting**	
CO1	To understand the concepts of Final Accounts of Banking Company (including Profit & Loss Account & Balance Sheet)
CO2	To understand the concept of share, need, & various method of valuation of Shares
CO3	To understand the need, characteristics, method of valuation of goodwill. Including Average Profit Method, Super Profit Method & Capitalization Method
CO4	To enable the students to develop awareness about corporate accounting.

Course/ Subject: **Auditing**	
CO1	Apply critical thinking skills and solve auditing problems.
CO2	To understand the Concepts of dividend and types of dividend
CO3	To articulate knowledge of Fundamental Audit concepts
CO4	To understand the concept of Internal Check System, Audit Program, Routine Checking and Vouching Verification and Valuation of Asset and Liabilities
CO5	

B. Com Final Year Semester V & VI

Course/ Subject: **Business Environment**	
CO1	To provide knowledge and interpret sector wise Business Environment of India
CO2	To understand Indian Agriculture Environment and agriculture economy of India
CO3	To gain knowledge about Indian Industrial environment and various industrial policies
CO4	To Understand about role and importance of service sector in Indian economy

CO5	To learn about foreign and international trade and its various tools and techniques

Course/ Subject: Business law

CO1	The student will well verse in basic provisions regarding legal frame work governing the business world.
CO2	To know the students with the basic concepts, terms & provisions of Mercantile and Business Laws.
CO3	To develop the awareness among the students regarding these laws affecting trade business, and commerce.
CO4	To inculcate knowledge on various laws relating to business such as law of contract, law of sale of goods, law of agency, Negotiable Instruments Act. Consumer Protection Act etc.
CO5	

Course/ Subject: Cost & Management Accounting I and II
Semester V & VII

CO1	The students will be capable of applying and handling the accounting treatment of Cost accounting of company.
CO2	Understanding application of practice tools and methods in management accounting.
CO3	It will help to recognize commonly used financial statements, their components and how information from business transactions flows into these statements.
CO4	To understand the application of costing to apply for tender or quotation
CO5	To understand the Techniques of Ratio Analysis, Breakeven Point & Fund flow statement

Course/ Subject: E-commerce I and II
Semester V & VII

CO1	To understand the working of e
CO2	To explain the growth & future of e
CO3	To understand the e
CO4	To understand the Internet based various e-commerce business models and its applications.
CO5	To explain the internet marketing and its importance in online business.
CO6	To understand and analysis e-governance various models ,application and importance

Course/ Subject: Internet and World Wide Web I and II

Semester V & VII	
CO1	To gives a deeper understanding of Internet and Network Technology
CO2	To familiarize the student with various applications of internet technologies in business
CO3	To provide skills and knowledge to create and maintain a website for business
CO4	To prepare students in web designing using various web tools.
CO5	To develop skill and knowledge among students in applications of internet in education of commerce.
CO6	

Course/ Subject: Economics of Development Semester VI

CO1	To interpret various growth model and applicability in present scenario
CO2	To understand the concept of economic development and growth
CO3	To understand various growth model and their applications
CO4	To understand concept and importance of special economic zone (SEZ)
CO5	To understand the importance of human resource development and quality of human capital

Course/ Subject: Company Act 2013 Semester VI

CO1	To impart basic knowledge of the provisions of the Companies Act
CO2	To impart students with the knowledge of fundamentals of Company Law and provisions of the Companies Act of 2013.
CO3	To apprise the students of new concepts involving in company law regime.
CO4	To acquaint the students with the duties and responsibilities of Key Managerial Personnel.
CO5	To explain the meaning and nature of share, debenture, capital and their type.

Department of Computer Science
Program Outcomes, Program Specific Outcomes& Course outcomes

B.Sc. COMPUTER SCIENCE Program Outcomes
1. This program makes learners aware of the history of the discipline of Computer Science and understand the conceptual underpinnings of the subject. 2. Students understand the nature of the software development process, including the need to provide appropriate documentation. 3. The program also empowers the graduates to appear for various competitive examinations or choose the post graduate programe of MSc Computer Science . 4. Understand the nature of the software development process, including the need to provide appropriate documentation. 5. Understand standard techniques for solving a problem on a computer, including programming techniques and techniques for the representation of information.

B.Sc. COMPUTER SCIENCE Programme Specific Outcomes
1.Be able to analyses a problem, construct alternate approaches to its solution and evaluate the merits and demerits of each. 2.Be aware of the history of the discipline of Computer Science and understand the conceptual underpinnings of the subject. 3.Understand the nature of the software development process, including the need to provide appropriate documentation. 4.Be able to program fluently in one or two programming languages. 5.Understand the major programming paradigms and be able to learn a new programming language in a fairly short time. 6.Understand standard techniques for solving a problem on a computer, including programming techniques and techniques for the representation of information. 7.Understand the basic theory of computer architectures, including computer hardware and networking. 8. Understand the importance and the nature of operating systems and compilers. 9.Understand how information technology affects society, business and the individual, both from a technical and from an ethical and legal point of view. 10. Be able to effectively communicate with persons who are not technically versed in the subject 11.Be able to communicate effectively, both orally and in writing. 12. Recognize the need for life-long learning and development. 13. Be able to work in teams.

Course Outcome for B.Sc. (Computer Science).	
1S.Programming in C and Computer Fundamentals	
CO1	Introduction to Computer ,its generation, block diagram of computer Understanding the concept memory & its types ,input and output devices of Computers
CO2.	Describe the basic components of an operating system and their role in Implementations for general purpose, real-time and embedded applications. Explain Types of O.S. Explain File attributes and File Handling

CO3	Explain the local, metropolitan and wide area networks. Discussion of various networking technologies. Explain the concepts of protocols, network interfaces . Explain internet, its history and various types of connection.
CO4.	Explain the basic terminology used in computer programming Explain Flowchart assembler, compiler &n interpreter. Explain about the basic concepts of program development stages. Explain Structured Programming. Explain history of C and Structure of C program
CO5.	Write, compile and debug programs in C language and use different data types for writing the programs. Explain Constant and variables. Explain Operators and their types and its precedence.
CO6.	Discuss I/O operation i.e Formatted and Unformatted . Design programs connecting decision structures, conditional statements and loops . Explain jumps in Loops

2S.WEB Technology and Advanced Programming in C

CO1.	Explain History of HTML. Explain Various HTML tag. Explain Attributes of Alignment, Color & text.
CO2.	Describe Style sheet with its advantages and disadvantages. Explain CSS & its types of style sheet Explain CSS with HTML.
CO3.	Introduction of XML and how it is differ with HTML Introduction and need of DTD and its types Discuss CSS with XML.
CO4.	Describe Array and its types,its Declaration. Explain Pointer and Strings with string Function and String handling mechanism.
CO5.	Explain Function and its Need. Discuss about the various types of Functions . Explain Function Recursion.
CO6.	Explain the Concepts of structures and Unions. Explain File handling in C with creating and opening file. Illustrates the various operations performed on different types of files.

3S. Data Structure and C++

CO1.	Introduction to Data structure ,its types and operation
CO2.	Explain Queues ,its representation and its operation Discuss Circular Queue ,dequeue and Priority Queue
CO3.	Explain Trees, Concept of binary tree and traversing Operation Explain Sorting and Searching Techniques
CO4.	Explain OOPS ,its Introduction ,Advantages and application Explain Classes and Objects Explain Managing console I/O process Explain Operator in C++ with new and delete operator
CO5.	Explain Function in C++ with Friend function and Inline Function Describe Array of Object and This pointer Explain Constructor and Destructor

CO6.	Explain Operator overloading with unary and binary operator
	Explain Inheritance, its types and Virtual base class

4S.Relational Database Management System & PL/SQL

CO1	Describe the fundamentals of File processing and database processing system.
CO2.	Explain the various data model and its application.
CO3	Explain the various normal forms and its role in DBMS.
CO4.	Explain the fundamental concepts of SQL programs.
CO5.	Describe the concepts of function, procedure, package, trigger and exception handling.
CO6.	Explain Transaction and its properties.
	Explain Securities of Database by maintaining user and privileges

5S. Java Programming and Vb.net

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

6S. Advanced Java Program and vb.net

CO1.	Discuss Exception handling and multithreading
CO2.	Describe Applet,its life cycle with all its attributes ,Explain graphics class
CO3.	Explain Event Handling, Event delegation Model
	Explain AWT ToolKit
CO4.	Explain How control is added in form
	Discuss msgbox & inputbox function
	Explain Keyboard and mouse event with common control
CO5.	Explain class,object ,method and event
	Describe Exception handling and exception class in .net framework
CO6.	Explain data Access with ADO.net
	Discuss accessing data with server Explorer
	Describe how to create new connection,displaying data in data grid
	Discuss data adapter control

- **Programming in C LAB**

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

- **Data Structure Lab Using C++**

CO1	Explain the features of C++ using object oriented programming.

CO2.	Describe the relative merits of C++ as an object oriented programming language.
CO3	Describe the major object-oriented concepts to implement object oriented programs in C++ Using encapsulation and inheritance.
CO4.	Describe the major object-oriented concepts to implement object oriented programs in C++ Using polymorphism.

- **Java Programming Lab**

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

- **Web Design Technology Lab**

CO1	Explain the fundamental tags used in HTML.
CO2.	Develop the web page in various applications.
CO3	Develop the web page using various ordered and unordered listing commands
CO4.	Develop the web page using frame concepts with multi-media handling.

DEPARTMENT OF ECONOMICS

I. <u>Program Outcome of Bachelor of Arts (B.A.)</u>

Student seeking admission for B.A. programme is expected to imbue with following quality which help them in their future life to achieve the expected goals.

- The students after completion of B.A. programme in Economics will develop understanding of the major concepts and principles in Economics.
- The program also empowers the graduates to appear for various competitive examinations or choose the post graduate program of their choice.
- The B. A. program enables the students to acquire the knowledge with human values framing the base to deal with various problems in life with courage and humanity.
- The students will be ignited enough to think and act over for the solution of various issues prevailed in the human life to make this world better than ever.
- Understand the issues of environmental contexts and sustainable development.
- To make student able to realize the importance of human values.
- To make student aware regarding social service.
- To provide the students a well-founded education in Economics.
- To provide the students with the opportunity to pursue courses that emphasize quantitative and theoretical aspects of Economics.
- To provide a well-resourced learning environment for Economics

II. Programme Specific Outcomes of Economics

- Understanding the efficiency and equity implications of market interference, including government policy.
- Developing research knowledge in economics.
- Developing the skill of data collection & use of sampling techniques in research.
- Creating awareness about changing macro-economic policies and theories.
- To provide students a well-founded education in Economics.
- Students have the knowledge of Financial Institutions and Markets, and understand the structure and functions of banking.
- They secure employment in various services of Economics, Statistics and Banking
- They have effective oral communication and writing skills for clearly expressing economic point of view.
- They will be able to analyses economic behavior in practice.
- Economics students in general will be able to pinpoint and understand the past, present economic conditions of the country.

III. Course Outcomes of Economics

B.A.-I-SEM-I Micro Economics

- It will help students in understanding the behaviour of individuals and small organizations in making decisions on the allocation of limited resources..
- Judging the factor pricing.
- Understand the importance, causes and impact of population growth and its distribution, translate and relate them with economic development.
- Students will understand and demonstrate core micro-economic terms, concepts, and theories.

B.A.-I-SEM-II -ECONOMY OF MAHARASHTRA

- It will result in comprehensive understanding of Maharashtra Economy
- Student will be able to understand govt. policies and programs
- Student will be able to understand the landscape of Maharashtra economy
- Students will be able to understand how planning and infrastructure support can develop an economy**.**

B.A.-II-SEM-III- MACRO ECONOMICS

- To make student aware of the basic theoretical framework underlying the field of macroeconomics.
  - It helps students to study the aggregates and to provide overall idea about national economic policies and its implications.
  - Explain and anticipate the consequences of changes in the quantity of money on such economic variables as interest rates, inflation, the exchange rate, and unemployment
  - Understand various concepts of money and money substitutes

B.A.-II-SEM-IV- BANKING

- It is designed as a contemporary, rigorous, innovative and practical course   that aims to infuse the participants with the relevant banking knowledge and skills.
- To give in-depth knowledge of Banking & Finance to the students of economics with practical inputs and prepares them as a responsible customer.
- Students will be able to understand the nature of financial instruments and their usage.

B.A.-III-SEM-V- INDIAN ECONOMY

- It will result in comprehensive understanding of Indian Economy
- Student will be able to understand govt. policies and programs
- To give in-depth knowledge of Banking & Finance to the students of economics
- A little understanding of India and Global economy will also be included.

B.A.-III-SEM-V- DEMOGRAPHY

- To make the students aware of the importance of population in economic development and the various theories that explain the growth of population in a country.
- Students will learn how to think critically about public policy issues.
- Understand the importance, causes and impact of population growth and its distribution, translate and relate them with economic development.
- Understand demographic measurements like fertility and mortality rates
- Describe a variety of demographic theories such as Malthusian, cornucopian, zero population growth, and demographic transition theories.

ADARSHA SCIENCE, J. B. ARTS AND BIRLA COMMERCE MAHAVIDYALAYA, DHAMANGAON RAILWAY.

DEPARTMENT OF ELECTRONICS

PROGRAMME: M. Sc.

PROGRAMME OUTCOMES (POs)

FACULTY–SCIENCE

After graduating from science faculty, a student should have:

Critical thinking

•   Understood the basic concepts, fundamental principles, and scientific theories based on various scientific phenomena and their applications in life activities.

•   Acquired expert skills in handling and operating the different laboratory instruments, analyzing scientific data and performing laboratory oriented experiments, highlight significant observations and deduce the logical inferences/conclusions based on facts and findings.

Effective Communication

•   Developed numerous communication skills such as writing, reading, listening, speaking, etc., which shall eventually help in expressing thoughts, ideas and cognitive views evidently and effectively.

Social Communication

•   Developed an aptitude for participating in various socio-cultural activities with enthusiasm, to disperse the seeds of knowledge and contribute in creating awareness about the social myths, disbeliefs.

•   Realized that importance of knowledge of other faculties such as Arts, Commerce performing arts, social sciences and sports can greatly and effectively influence & inspire in evolving new scientific theories and inventions.

Effective Citizenship

•   Developed a patriotic and disciplined citizen following the rules and regulations for further development of society.

Ethics

•   Imbibed science oriented ethical, moral and social values in personal and social life leading to highly cultured and civilized personality.

Environment and Sustainability

•   Understood the need of rational use of natural resources and be aware of waste treatment reduction in carbon footprint for sustainable environment

Self-directed and Life-long Learning

•   Realized that pursuit of knowledge is a lifelong activity and in combination with untiring efforts and positive attitude to rejoice a successful life.

•   Developed creative thoughts and propose novel ideas to solve the immediate societal problems and invade in advancing the current technologies.

Carrier perspective

- Able to work in different areas such as Public service commissions, education system, industry, medical fields, defense area, research field etc.
- Aspire to work in different areas of education system, research and development, industries, etc. research and development

Statements of Programme Specific Outcomes (PSOs)

By the end of this programme, the students will be able to:

1. Understand the basic concepts of different Electronics components, Network theorems, Measuring instruments, Semiconductor devices, Integrated circuits, Digital Electronics, Amplifiers, Converters, Microprocessors Microcontroller programming, Modulations, Instrumentation, Transducers, Sensors, Actuators, Biomedical instrumentation, Timers, advance microcontroller.

2. Study and analyze different parameters of various electronic circuits.

3. Understand the use of Electronics components and circuits in day to day life.

4. Perform and testing of different electronics components and circuits.

5. Study and Analyze the different input, output characteristics of different devices and components.

6. Handle and control different machines in industries.

7. Develop different Antenna set up for communication and broadcasting purpose.

8. Understand the application of Electronics in domestic appliances.

9. Built and develop different power electronics system.

10. Program advance microcontrollers for different applications.

11. Identify different computer hardware and interfacing techniques.

12. Analyze the relationship between analog and digital circuits.

13. Understand the basic concepts of VLSI design and VHDL programming.

14. Develop different virtual instrumentation system for different applications.

15. Understand numerical methods and programming using C language.

16. Understand the concept of fuzzy logic and neural network for different learning.

17. Repair small household electrical and electronics appliances.

18. Construct different electronic devices and system for commercial and industrial purposes.

19. Able to join different electronics industries as technician or as embedded engineer.

20. Work as Instructor in different School and colleges for skill oriented programs such as ATAL labs.

Statement of Course Outcomes (COs)

Programme: M.Sc. SEM I Course: 1ELE1-Fundamentals of Semiconductor Devices

Course Outcomes: By the end of this course, the students will be able to:

- Know brief idea about different type of semiconductor in detailed.
- Know the basic diode and their characteristics in detailed.
- Learn different diodes in detailed.   Applications of semiconductor devices in microwave communication.
- Learn and analysis different transistor and switching device in detailed.
- Understand different fabrication methods of semiconductor technology in detailed.

Programme: M.Sc. SEM I Course: 1ELE2- Instrumentation and Measurement Techniques

Course Outcomes: By the end of this course, the students will be able to:

- Know all the display device and printers in detailed.
- Know all the digital measuring instruments in detailed.
- Learn about all the signal analyzer in de counters and measuring instrument.
- Learn all type and application of transducer.
- Learn about detailed knowledge about CRO, frequency measuring instruments and audio amplifier.
- Set up microwave frequency measurement.

Programme: M.Sc. SEM I Course: 1ELE3- Biomedical Instrumentation

Course Outcomes: By the end of this course, the students will be able to:

- Know basic concepts of measurement biomedical system in detailed.
- Learn all the biomedical signal and electrodes of their use in biomedical system in detailed.
- Understand all biomedical recorders used in biomedical system in detailed.
- Learn all the concept of Magnetic Resonance Imaging System and its application in detailed.
- Know all the radiation sources and equipment in detailed.

Programme: M.Sc. SEM I Course: 1ELE4- Optical Electronic devices and applications

Course Outcomes: By the end of this course, the students will be able to:

- Basic concepts of optical fiber system mechanism and its different applications in detailed.
- Learn different parameter of optical sources in detailed.
- Know the principal and application of all Photo detector devices in detailed.
- Know the principal and application of all Optical Instruments in detailed.
- Learn the type of laser, its application and different uses in detailed.

Programme: M.Sc. SEM II Course: 2ELE1- Analog Circuit Design And Analysis

Course Outcomes: By the end of this course, the students will be able to:

- Learn basic concepts and characteristic of operational amplifier in detailed.
- Learn different type of operational amplifier circuits in detailed.
- Learn frequency response amplifier and different application of OPAMP in detailed.
- Know filters circuit, comparators and convertors knowledge in detailed.
- Learn all the multivibrators and regulators application.

Programme: M.Sc. SEM II Course: 2ELE2- Microprocessor and Microcontroller

Course Outcomes: By the end of this course, the students will be able to:

- Learn brief introduction of basic concepts of 8086 microprocessor in detailed.
- Know the PIN diagram of 8086, minimum mode and system Configurations.
- Learn brief introduction of basic concepts and family of 8051 microcontroller and embedded systems.
- Know I/O port programming and different addressing modes. Also learn PIN description 8051.
- Learn all type of instruction sets and operations of 8051 microcontroller.

Programme: M.Sc. SEM II Course: 2ELE3- Digital IC'S & Design

Course Outcomes: By the end of this course, the students will be able to:

- Learn develop digital circuits and bolean algebra theorems in detailed.
- Design various integrated circuits using 74XX series in detailed.
- Learn application of memories with microprocessor and microcontroller.
- Learn development of digital display circuits in detailed.
- Learn Asynchronous sequential network analysis.

Programme: M.Sc. SEM II Course: 2ELE4- Mechatronics

Course Outcomes: By the end of this course, the students will be able to:

- Learn basic introductory concept of Mechatronics system.
- Know control system and basic concepts.
- Learn introductory PLC knowledge in detailed.
- Learn communication system knowledge in detailed.
- Learn fault finding concepts in mechatronics.

Programme: M.Sc. SEM III Course: 3ELE1- Antenna and Mobile Communications

Course Outcomes: By the end of this course, the students will be able to:

- Learn design of antenna and parameters in detailed.
- Learn different type of antennas and its application with detail.
- Understand basic knowledge of mobile communication in detail.
- Learn different modulation techniques of mobile communication.
- Learn multiple access Techniques and digital mobile system in detail.

Programme: M.Sc. SEM III Course: 3ELE2- Power Electronics

Course Outcomes: By the end of this course, the students will be able to:

- Learn basic knowledge of Power Electronics system and parameters concepts in detail.
- Know power electronics devices, power diodes, Thyristor devices, power transistor device in detail.
- Learn different rectifiers, controllers and converters knowledge in detail.
- Learn choppers and inverters knowledge in detail.
- Learn types of supply, motors drives, parameters and applications in detail.

Programme: M.Sc. SEM III Course: 3ELE3- Advanced Microcontroller and Embedded system

Course Outcomes: By the end of this course, the students will be able to:

- Learn design and development of embedded system for society and industry in detail.
- Learn basic concepts of AVR and ARM processor, selection of process for embedded system.
- Learn introduction of basic concepts and application of embedded system.
- Learn communication standards and interfacing devices. They also know skill for development of hardware in embedded system.
- Learn software development tool and debugging of embedded system skill in detail.

Programme: M.Sc. SEM III Course: 3ELE4- Computer Hardware and Interfacing

Course Outcomes: By the end of this course, the students will be able to:

- Learn knowledge of CPU essentials and peripheral effect in detail.
- Learn internal structure of motherboard knowledge and error handling in detail.
- Learn knowledge of different storage system used in CPU.
- Learn interfacing standard and peripheral knowledge.
- Learn different bus architecture knowledge.

Programme: M.Sc. SEM IV Course: 4ELE1- VLSI Design and VHDL Programming

Course Outcomes: By the end of this course, the students will be able to:

- Learn introduction and design of component using VLSI circuit.
- Learn knowledge of design of IC chips.
- Understand skill of design and development tools for fabrication of IC.
- Learn introduction and programming skill of VHDL.
- Learn various combinational circuits design and development using VHDL.

Programme: M.Sc. SEM IV Course: 4ELE2- Virtual Instrumentation

Course Outcomes: By the end of this course, the students will be able to:

- Learn detailed idea about VI programming and environment.
- Learn VI programming techniques in detail.
- Learn knowledge of DAQ system interface in detail.
- Learn basic common interface and communication system.
- Learn application and sensor technology knowledge with its application in detail.

Programme: M.Sc. SEM IV Course: 4ELE3- Numerical Methods and C Programming

Course Outcomes: By the end of this course, the students will be able to:

- Learn knowledge of C tokens and programming.
- Learn knowledge of Array and function of programming using user defines function.
- Learn knowledge of structure and pointers in detail.
- Learn basic knowledge numerical system and different numerical methods solution in detail.
- Learn knowledge of different numerical method and problems solving solution in detail.

Programme: M.Sc. SEM IV Course: 4ELE4- Fuzzy logic and Neural Networks

Course Outcomes: By the end of this course, the students will be able to:

- Learn utility, classical set and fuzzy sets and relations in fuzzy logic in detail.

- Learn different properties, logic and fuzzy system in membership function in detail.

- Learn programming concept related to fuzzy system and decision making methods in detail.

- Learn Neural and fuzzy machine Intelligence and network theory in detail.

- Learn unsupervised learning in neural networks in detail.

Date: 12/09/2020   **Dr. S. A. Rodge**

Head Department of Electronics

ADARSHA SCIENCE, J. B. ARTS AND BIRLA COMMERCE MAHAVIDYALAYA, DHAMANGAON RAILWAY.

DEPARTMENT OF ELECTRONICS

PROGRAMME: B. SC.

PROGRAMME OUTCOMES (POs)

FACULTY–SCIENCE

After graduating from science faculty, a student should have:

Critical thinking

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• Developed creative thoughts and propose novel ideas to solve the immediate societal problems and invade in advancing the current technologies.

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• Able to work in different areas such as Public service commissions, education system, industry, medical fields, defense area, research field etc.

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By the end of this programme, the students will be able to:

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2. Study and analyze different parameters of various electronic circuits.
3. Understand the use of Electronics components and circuits in day to day life.
4. Perform and testing of different electronics components and circuits.
5. Study and Analyze the different input, output characteristics of different devices and components.
6. Understand the application of Electronics in domestic appliances.
7. Analyze the relationship between analog and digital circuits.
8. Repair small household electrical and electronics appliances.
9. Construct different electronic devices and system for commercial and industrial purposes.
10. Able to join different electronics industries as technician or as embedded engineer.
11. Work as Instructor in different School and colleges for skill oriented programs such as ATAL labs.

Statement of Course Outcomes (COs)

Programme: B.Sc. SEM I Course: Basics of Electronics

Course Outcomes: By the end of this course, the students will be able to:

1. Identify the different electronics components used in electronic circuits.
2. Understand working principle of different measuring instruments.
3. Understand the working of solid state semiconductor devices used in the circuit.
4. Describe working, characteristics and applications of semiconductor devices.
5. Understand different concepts of optoelectronics devices and applications.
6. Understand Integrated circuits fabrication technology.

Programme: B.Sc. SEM I Course: Practical

Course Outcomes: By the end of this course, the students will be able to:

1. Identify different Electronic components.
2. Design the circuits using bread boards.
3. Performs the calculations on combination of basic components such as resistors and capacitor.
4. Solved different complex circuits using network theorems
5. Analyze the characteristics of different diodes, BJT, FET, MOSFETs, etc.

Programme: B.Sc. SEM II Course: Digital Electronics

Course Outcomes: By the end of this course, the students will be able to:

1. Understand the concepts of digital electronics.
2. Understand the basic concept number system.
3. Understand different logic gates and Boolean laws.
4. Understand adder circuits.
5. Understand the basic concepts of different logic families and characteristics.
6. Understand the concept of flipflops, counters and shift registers.
7. Understand different combinational logic circuits such as encoder, decoder, multiplexer, demultiplexer.
8. Understand the construction and working principle of memories.

Programme: B.Sc. SEM II Course: Practical

Course Outcomes: By the end of this course, the students will be able to:

1. Perform conversions of different number system.
2. Develop different circuits using combinations of logic gates.
3. Simplify complicated digital equations using Boolean laws.
4. Selection and implementation of specific logic family for specific applications.
5. Construct multivibrators, flip-flops using logic gates.
6. Construct registers, counters using different flipflops.
7. Reading, writing and erasing process of different memories.

Programme: B.Sc. SEM III Course: Electronics Devices and Circuits

Course Outcomes: By the end of this course, the students will be able to:

1. Describe Hybrid-parameters, equivalent circuit of transistor in different configuration, analysis, cascading, coupling tuning of amplifier.
2. Calculate different hybrid parameter for different configurations.
3. Understand working principle of different power amplifiers.
4. Understand the concept of feedback amplifier and oscillators.
5. Describe different parameters of operational amplifiers.
6. Construct inverting, noninverting amplifier, adder, subtractor, differentiator and integrator.
7. Develop more advance applications like oscillators, amplifiers and multivibrator.

Programme: B.Sc. SEM III Course: Practical

Course Outcomes: By the end of this course, the students will be able to:

1. Calculate different hybrid parameters for different transistor configurations.
2. Construct, verify and calculate efficiency of various power amplifiers such as Class A, B, C, AB power amplifiers.
3. Construct and calculate frequency parameters of different Oscillators.
4. Derive different circuits such as Adder, subtractor, intergrator, differentiator, etc.
5. Construct and test various Op-Amp circuits such as multivibrators, comparator, amplifier etc
6. Construct and study different Analog and digital converters.

Programme: B.Sc. SEM IV Course: Communication Electronics and Microprocessor 8085

Course Outcomes: By the end of this course, the students will be able to:

1. Understand the concept of Modulation and demodulation.
2. Understand the concepts and working of AM and FM transmitters and receivers.
3. Understand fiber optic communication process.
4. Understand the concept and different types of Pulse modulation in digital communication.
5. Understand internal architecture, function of each block, and each pin of IC 8085.
6. Understand instruction format and instruction cycles of 8085 microprocessor.
7. Program 8085 microprocessor using different instructions.
8. Prepare algorithm and flowcharts of different programs.
9. Understand the interfacing concept of microprocessor with other peripheral devices.

Programme: B.Sc. SEM IV Course: Practical

Course Outcomes: By the end of this course, the students will be able to:

1. Perform Amplitude and frequency modulation and demodulation.
2. Calculated different parameters in fiber optic communications.
3. Perform pulse modulation for digital communication.
4. Program 8085 microprocessor for different applications.
5. Interface 8085 microprocessor with peripheral devices for further applications.

Programme: B.Sc. SEM V Course: Measuring Instruments

Course Outcomes: By the end of this course, the students will be able to:

1. Understand the concept of generalized instrumentation system.
2. Understand the construction and working principle of different transducers.
3. Understand block diagram of Timer IC 555.
4. Construct Astable, monostable and bistable multivibrator ciruits using IC 555.
5. Understand block diagram and concept of Phase lock loop.
6. Understand use of PLL for the applications such as FM demodulator, AM detector and frequency synthesizer.
7. Understand the concept of different display devices.
8. Understand the working principle of digital instrument such as digital frequency meter, digital voltmeter, and digital capacitance meter.
9. Understand the concept of different recorders.
10. Understand the working principle of different Sensors and actuators.
11. Understand the working principle of different biomedical equipment.

Programme: B.Sc. SEM V Course: Practical

Course Outcomes: By the end of this course, the students will be able to:

1. Measure different physical parameters using resistive, inductive, capacitive transducers, and displacement measurement using capacitive transducer.
2. Develop different multivibrator circuit such as monostable, astable and bistable circuit using IC 555.
3. Implement different circuits of PLL as FM demodulator, AM detector and frequency synthesizer.
4. Implementation of different display devices, digital instrument and encoder.
5. Measurement of different physical parameters using sensors and actuators.
6. Measurement of different biological signals using Electronic instruments.

Programme: B.Sc. SEM VI Course: Advance Microprocessor and Microcontroller

Course Outcomes: By the end of this course, the students will be able to:

1. Understand internal architecture and pins of IC 8086, function of BIU and EU, concept of different registers, addressing of register and memory.
2. Understand different instruction and programming of 8086 microprocessors.
3. Programming of 8086 microprocessor using assembly language programming.
4. Understand internal architecture of 8051 microcontroller.
5. Programming of 8051 microcontroller.
6. Understand the interfacing concept of and applications of 8051 microcontroller.
7. Understand architecture and different internal blocks of AVR microcontroller.

Programme: B.Sc. SEM VI Course: Practical

Course Outcomes: By the end of this course, the students will be able to:

1. Program 8086 microprocessor for addition, subtraction, multiplication and division etc using assembly language programming.
2. Program 8051 microcontroller for addition, subtraction, multiplication and division etc using assembly language programming.
3. Interface 8051 microcontroller with RS232, DAC, ADC and 8255 PPI.

Date: 12/09/2020   **Dr. S. A. Rodge**
                                                        Head Department of Electronics

B. A. (COMPULSORY ENGLISH)

Course Outcomes (CO's)

B. A. I, B. A. II, B. A. III (English Compulsory)

After successful completion of the course, a student will learn following skills-

1. Spoken communication and written communication.

2. Writing of Resume, letters of application, business letters.

3. Writing News-report, Essay, paragraph, review, etc.

4. Narration of experience, daily routine.

5. Interview Techniques.

6. Understanding and interpretation of poem, prose, essay, short stories, etc.

B. Com. (COMPULSORY ENGLISH)

Course Outcomes (CO's)

B. Com. I, B. Com. II, B. Com. III (Compulsory English)

After successful completion of the course, a student will learn following skills-

1. Spoken communication and written communication.

2. Writing of Resume, letters of application, business letters.

3. Writing News-report, Essay, paragraph, Review, etc.

4. Communication and its types.

5. Interview Techniques, Presentations and Leadership.

6. Understanding and interpretation of poem, prose, essay, short stories, et

B. Sc. (COMPULSORY ENGLISH)

Course Outcomes (CO's)

B. Sc. I (Compulsory English)

After successful completion of the course, a student will learn following skills-

1. Use correct English in oral as well as written form.

2. Inculcate the human values for one's transformation of behaviour. 3. Interpret the literary works by critical analysis.

4. Compare literary works of the great writers and philosophers by using their logic and literary competency.

5. Nurture themselves in soft skills and develop research aptitude.

6. Apply the study of English Language & Grammar in their practical life.

Department of History Program Specific Outcomes

B.A History

1] Students will have the ability to apply historical methods to evaluate critically the past and how historians and others have interpreted it.

2] Students will be able to acquire basic historical research skills, including the effective use of libraries, archives and data bases.

3] Being a subject of social science, history has its own value in society and human life.

4] Understand background of our religion, customs institutions, administration and so on.

5] Understand the present existing social, political, religious and economic conditions of

the people.

6] Students will be able to recognise how different individuals, groups, organisations, societies, cultures, countries and nations have affected history. History gave the students wisdom and foresight for the future.

7] Analyze relationship between the past and the present is lively presented in the

history.

8] Develop practical skills helpful in the study and understanding of historical events.

They:

 (a) Draw historical maps, charts, diagrams etc.

 (b) Prepare historical models, tools etc.

9] Develop interests in the study of history and activities relating to history. They:

   (a) Collect ancient arts, old coins and other historical materials;

   (b) Participate in historical drama and historical occasions;

   (c) Visit places of historical interests, archaeological sites, museums and archives;

   (d) Read historical documents, maps, charts etc.

   (e) Play active roles in activities of the historical organizations and associations; and

   (f) Write articles on historical topics.

10] A history student may choose his or her career in journalism or any other editorial board. They may get job in museum, archives and libraries. Beside those, in the field of research and archaeology they may proceed.

Department of History Course Outcomes

B.A. - SEM I : History of India , From Earliest Times to 1206 AD

1) Students will be able to examine institutional basis of Ancient Ind

2) Students will be able to illustrate the development of empire

3) Students will be able to explain our heritage through cultural aspects of Ancient India.

4) Students will be able to indicate multiple cultures (Vaidic , Jain , Bouddha, Mourya , Vakatak etc) of Ancient India

5) They take interest to visit historical place and understand ancient India through caves, Temple, Art Architecture.

6) They collect Art ,coins, other material related to Ancient History

7) They knowing the importance of Sources of History.

B. A. - SEM II : History of India , From 1206 AD to 1525 AD

1) To study and Analyze Administration of Qutubuddin Aibak , Allutmish, Razia, Balban

2) To understand Political and Administrative Policy of Allauddin Khialaji

3) To Comrehend the Social, Economical and Relegious Condition of Bahamini Vijaynagar Kingdom.

4) To Evaluate the Political structure during Sultanate Period.

5) To understand the economical and Technological Development during Sultanate Period.

6) To understand the social status of Women during Sultanate Period.

B.A.- SEM III :History of India, From 1526 AD to 1756 AD

1) To study and Analyze Sources of Medieval Indian History.

2) To know economical , social, religious and cultural conditions of Mugal Periods

3) To understand Political Admistration , Military system , Judicial administration and religious policy of Maratha.

4) Students will be able to demonstrate by analyzing and evaluating historical information from multiple sources of Maratha History

5) Students will be able to examine the difference between fact and fiction of Maratha History

6) Students will be able to discuss the religious policies of Chhatrapati Shivaji Maharaj and background of healthy Nationalism in India

B,A,- SEM IV: History of India , From 1757 AD to 1947 AD

1) To understand the advent of Portuguese , French and British.
2) To study and analyze the revolt 1857 AD.
3) To understand the concept of Nationalism.
4) To study the various concept of Mahatma Gandhi

B.A.- SEM V: History of Modern Europe 1780 AD to 1920 AD

1) To study and analyze French Revoluation

2) To know making of nation.

3) To acquire knowledge of Ruse-French pact

4) To know about first world war.

5) To understand paris peace conference and Varsaya pact.

B.A.- SEM VI: History of Modern World From 1921AD to 1965 AD

1) To understand the concept of Fasicam and Nazism

2) To know about the second world war.

3) To study and analyze united nation organization.

4) To acquire knowledge of the cold war and different Military Alliances.

5) To know about the suez crisis,

6) To understand Alligned movement.

Program Outcomes

After the completion of the program the students are able to:

1. Develop among themselves a spirit of scientific temper and inquiry.

2. Deal with the situations, problems and people with better understanding.

3. Understand, analyze and explain the basic principles of science in most of its allied fields.

4. Develop among themselves a sense of social responsibility.

5. Handle the unexpected situation by critically analyzing the problem.

6. Think clearly and critically about the choices, aspirations, challenges, opportunities and threats in the course of their life.

7. Communicate with the world in a better and meaningful way

M.Sc. (Mathematics)

PSO (Program Specific Outcomes)

To develop problem-solving skills and apply them independently to problems in pure and applied mathematics.

- To assimilate complex mathematical ideas and arguments.
- To improve your own learning and performance.
- To develop abstract mathematical thinking. Apply knowledge of Mathematics, in all the fields of learning including higher research and its extensions.
- To understand the basic concepts of Mathematics and Formulae.
- Recognize the importance and value of mathematical thinking, training and approach to problem solving, on a diverse verity of disciplines.
- Mathematics is open door in engineering, business, finance, computing, data science, health sciences, environment science and public policy.
- Identify and become familiar with the scope, methodology and application of mathematics and learn to appreciate its ability to explain various aspects.
- Explain how Mathematics is useful for social and real life problems.

CO (Course Outcomes)

- Innovate, invent and solve complex mathematical problems using the knowledge of pure and applied mathematics.
- To solve one dimensional Wave and Heat equations employing the methods in Partial Differential equations.
- Utilize Number Theory in the field of Cryptography that helps in hiding information and maintaining secrecy in Military information transmission, computer password and electronic commerce.
- Facilitate in the study of crystallographic groups in chemistry and Lie symmetry groups in physics.
- Identify Simulation of ground freezing and water evaporation, Heat transfer analysis due to solar radiation, Calculation of temperatures and heat flow under steady-state or transient boundary conditions.
- Explain the knowledge of contemporary issues in the field of Mathematics and applied sciences.
- Work effectively as an individual, and also as a member or leader in multi-linguistic and multi-disciplinary teams.
- Adjust themselves completely to the demands of the growing field of Mathematics by lifelong learning.
- Effectively communicate about their field of expertise on their activities, with their peer and society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations
- Crack lectureship and fellowship exams approved by UGC like CSIR – NET and SET.
- To Learn Normal Subgroups and quotient group.
- To understand Isomorphism and Automorphism theorem.
- To understand Solvable group, Nilpotent group, Permutation groups and. Alternating Group.
- Learn to Direct product and Sylow theorem.
- Learn to ideal, Sum and Direct sum of ideal.
- To understand Maximal ideal and prime ideals.
- To understand the Nilpotent , Nil ideal and Zorn's lemma.
- Learn to unique factorization domain & Principle ideal domain
- To understand Concept of Euclidean domain & Polynomial rings over UFD
- Learn to Modules, R- homomorphism & quotient modules
- To understand complex integration,Cauchy's integral formula, Cauchy's inequality
- To Learn Liouvilles theorem & Fundamental theorem of algebra.
- Learn to Taylor's theorem, Morera's theorem & maximum modulus theorem
- To understand open mapping theorem, Cauchy Goursat theorem & Schwarz's lemma.
- Learn to isolated singularities,Laurent's Series development.
- To understand Casorti- Wierstrass theorem, Rouches theorem.
- To get Knowledge of Cauchy's residue theorem & Hadamard's three circle theorem.
- To understand Hurwitz theorem.

- To learn the Analytic Continuation, power series method of analytic continuation.
- To illustrate the working Hurwitz theorem.
- To get Knowledge of analytic continuation, uniqueness of direct analytic continuation.
- To understand Schwartz reflection theorem & Weierstrass factorization principle.
- To understand Cardinal and Ordinal Number , equipotent sets & Axiom of choice.
- To understand topologoical spaces , open sets & Limit points .
- To learn connectedness, compactness & Continuity, Homomorphism & Continuous functions.
- To understand Seperation & Countability Axioms .
- To learn the First & Second Axioms.
- To understand Seperation & Countability axioms.
- To understand Regular , Normal & Completely Normal spaces.
- To learn the concept of Local Intrinsic properties of a surface, Definition of surface and Surface of Revolution.
- To understand the Geodesic and its properties as well as Geodesic existence theorem.
- To learn the concept of Gaussian curvature and Gauss-Bonnet Theorem.
- To learn Tensor Calculus and Tensor Product of vector spaces.
- To learn Differential manifolds, Tangent Vector and Absolute derivation of Tensorial forms.
- To understand Lebesgue outer measure, Borel and Lebesgue measurability.
- To learn integration of Non-negative function.
- To learn Riemann and Lebesgue integrals.
- To learn Lebesgue differentiation theorem.
- To learn measure, Outer measure and Extension of measure.
- To understand Jensen's inequality, Holder and Minkowski inequlity.
- To learn Eigen value and eigen vector.
- To understand the concept Jordan form and rational form.
- To Learn Quadratic form, Linear Transformation, Canonical form and Harmition forms.
- To understand Einstein Criterion.
- To learn Normal and Separable extension .
- To learn Galois theory and Application.
- To understand Ruler and Compass constructions.
- To understand the solution of various types of Integral equations.
- To find Eigen value and Eigen functions.
- To solve the boundary value problems and To understand the concept of Greens function.
- To learn Metric Space and Baire Theorem.
- To learn Tichonov Topology and Tichonov Theorem.
- To understand Metrization and Para compactness.

- To learn Metric tensor and Christoffel Symbol.
- To understand Parallel vector field, curvature Tensor and Ricci tensor.
- To learn Maxima and minima.
- To understand Riemann Stieltjes integral.
- To learn Inner Product space, Normal linear Space, Reflexive spaces.
- To learn Parseval's identity, Bessels identity and Riesz lemma.
- To understand Lagranges equations and Hamiltonian equations.
- To learn linear programming, Transportation problems and Queuing system.
- To learn General Relativity and Einstein Rrlativity.
- To understand Birkhoff's theorem and Kepler problems.
- To learn Difference equation.
- To understand Riesz Representation Theorem.
- To solve Partial differential equations.
- To learn Charpit's and Jacobi's Method.
- To learn Solution of Algebraic and Transcendental equations.
- To solve Ordinary differential equation by various methods.
- To understand Einstein Field equation.
- To Solve simple games using various techniques · Analyze economic situations using game theoretic techniques · Recommend and prescribe which strategies to implement.

B. Sc. Mathematics

Program Outcomes

After the completion of the program the students are able to:

1. Develop among themselves a spirit of scientific temper and inquiry.

2. Deal with the situations, problems and people with better understanding.

3. Understand, analyze and explain the basic principles of science in most of its allied fields.

4. Develop among themselves a sense of social responsibility.

5. Handle the unexpected situation by critically analyzing the problem.

6. Think clearly and critically about the choices, aspirations, challenges, opportunities and threats in the course of their life.

7. Communicate with the world in a better and meaningful way

Mathematics

B. Sc. Mathematics

PSO (Program Specific Outcomes)

- To understand the basic concepts of Mathematics and Formulae.
- Recognize the importance and value of mathematical thinking, training and approach to problem solving, on a diverse verity of disciplines.
- Mathematics is open door in engineering, business, finance, computing, data science, health sciences, environment science and public policy.
- Identify and become familiar with the scope, methodology and application of mathematics and learn to appreciate its ability to explain various aspects.
- Explain how Mathematics is useful for social and real life problems.

CO (Course Outcomes)

- To Learn De Moivre's Theorem and Understand Relation Between Circular & Hyperbolic Function.
- To understand the Trigonometric Series & Euler's Series.
- To understand concept of Elements of Quaternion.
- Learn to Theory of equation & Descarte's rule of signs.
- Learn to concept of Matrices and Clayey –Hamilton theorem.
- To understand the definition of limit of a function and calculation of limit.
- To understand the Leibnitz theorem and L' hospital Rule.

- Learn to Mean Value Theorems.
- To understand Concept of Partial derivatives and Euler's Theorem.
- Learn to Integration and reduction formulae.
- To understand the First order differential equation
- To Learn Second order Linear differential equation.
- Learn to Reduction formulae
- To solved Partial Differential equation
- Learn to Charpits's general method of solution.
- To understand Concept of Vectors and its products.
- To get Knowledge of basic principles of Gradient, divergence, curl and Green theorem.
- To understand Concept of Sphere and Cone.
- To learn the definition of sequence and series and Sandwich theorem.
- To illustrate the working of Lebnitz Rule ,Abel's test and Dirichilet test.
- To get Knowledge of basic principles of limit and continuity, Taylor's theorem.
- To understand Lagrange's multipliers method and Jacobian.
- To understand Double and triple Integration and Gauss-stoke's theorem.
- To understand Divisibility & Euclidean algorithm.
- To learn prime number & linear Diophantine equation.
- To understand basic properties of congruence & Chinese remainder theorm.
- To learn the Arithmetic function & Euler's theorem.
- To understand Primitive roots and quadratic residues.
- To understand the concept of Group, Subgroup and Cosets.
- To learn the concept of Homomorphism & Isomorphism and its Theorem.
- To understand the properties of Ring and Ideals.
- To learn the constraints and Lagrange's equation of motion.
- To learn the central force motion and Virial Theorem.
- To understand concept of calculus of variation and Hamilton's principle.
- To understand concept of Rigid Body.
- To understand the Riemann Integral and Mean Value theorem.
- To understand the concept of improper integral and Beta-Gamma function.
- On Milne-Thomson Method.
- To learn the concept of metric space and Cauchy sequences.
- To understand the Legendre's and Bessal equation.
- To learn the concept of Laplace and Fourier Transform & its Application.
- To understand the concept of Vector Space, Basis and Linear Transformation.
- To Learn the Dual Space, Inner Product space & Modules.
- To understand the Concept of Graph & Operation graphs.
- To learn the concept of tree and Spanning tree.
- To find the fundamental circuit and planner graphs.
- To understand the vector spaces & orthogonal vectors.

MASTER OF COMMERCE (M.COM) OUTCOME

Program Outcome: -

1. Impart the students with conventional and contemporary trends in commerce field.
2. To make aware a student about the national as well as international trends in the field of industry.
3. To empower the students for self-employment, accounting and auditing practices, role of regulatory bodies in corporate and financial sectors nature of various financial instruments.
4. Sensitizing Professional ethics and societal needs with their holistic development
5. Prepare for pursue career in the field of academics and research.

Program Specific Outcomes: -

1. For pursuing PhD in their chosen research area.
2. To enhance the horizon of knowledge in various field of commerce through advertising and sales promotion, finance and entrepreneurial development.
3. To enhance the computer skills and its applicability in business through e-commerce principles.
4. Train the students on teamwork, lifelong learning and continuous professional development.
5. Prepare the students to apply Statistical methods and proficient use of tools for modeling and analysis of business data.
6. Equip the students to evaluate environmental factors that influence business operation with the conceptual requirements and skills on preparation and interpretation of financial statements.

Semester I

Managerial Economics

Course Outcome

1. Ability to forecast demand considering changing circumstances and to formulate business plans.
2. Ability to chalk out Business Policies.
3. Knowledge about Profit Planning and control.
4. Skill to analyze effects of Government Policies.

Services Marketing & Customer Relationship Management

Course Outcome

1. To know the services vision and mission
2. To study services positioning and differentiation
3. To familiarize service marketing mix
4. To analyze the customer focused services
5. To study the specific service marketing

Advanced Financial and Cost Accounting

Course Outcome

1. Ability to calculate Goodwill, evaluate shares adopting different methods and preparation of final accounts of Indian Companies.
2. To analyse the internal or external reconstructions of companies
3. To study the costing concept and methods
4. To analyse the unit cost and job costing

5. To know the process costing with normal and abnormal loss
6. To update the standard costing methods
7. To prepare the reconciliations statements.

Banking and Insurance Services

Course Outcome

1. Understanding the operations and working of insurance companies in India.
2. To familiarize the banking sector reforms
3. Capability to assess the significance of online banking.
4. Understanding the functions and significance of RBI in India.
5. Knowledge regarding different models of bancassurance in India.
6. Understanding of the different techniques of risk management

Semester II

Accounting for Managerial Decisions

Course Outcome

1. To know the basics of management accounting
2. To study the financial statement analysis
3. To familiarize fund flow cash flow statement
4. To analyze various budget
5. To familiarize with marginal costing

Strategic Management

Course Outcome

1. Familiarization with the strategic management process.
2. Understanding about the techniques to scan an environment and the role of environment scanning in hurdle less strategic management of an organization.
3. Understanding about the equal importance of strategy formulation and strategy implementation.
4. Clarity about the strategies followed by different companies in the corporate world.

Management Concept & Organizational Behavior

Course Outcome

Students will be able to understand: -

1. Evolution of Management and contribution of Management thinkers
2. the relevance of environmental scanning, planning and to take decisions,
3. Organizing and controlling
4. Individual and group Behavior
5. Leadership and Motivation.

Computer Applications in Business

Course Outcome

1. Gain familiarity with the concepts and terminology used in the development, implementation and operation of business application systems.
2. Explore various methods that Information Technology can be used to support existing businesses and strategies.

3. Investigate emerging technology in shaping new processes, strategies and business models.
4. Achieve hands-on experience with productivity/application software to enhance business activities.
5. Accomplish projects utilizing business theories, Internet resources and computer technology.
6. Work with simple design and development tasks for the main types of business information systems

Semester III

Research Methodology

Course Outcome

1. To fulfill the bank requirement of business research
2. To evaluate various research decisions
3. To know the methods of data collection
4. To study the analysis and interpretation of data
5. To familiarize report writing

Statistical Analysis

Course Outcome

1. To update basis of statistics
2. To analyse the various methods of theoretical probability distribution
3. To know the advanced statistical tools for analysis T,Z and d
4. To familiarize the correlation methods and regression analysis
5. To study the advanced application oriented tests – F , test and Anova

Corporate Tax & Management

Course Outcome

1. To update the current finance tax planning
2. To know the provisions of Income tax act
3. To study various heads of incomes
4. To analyze the profit and gain from business or profession
5. To identify the various other serious of income and capital gain
6. To understand tax planning and management for business.

E-Commerce & Legal Security

Course Outcome

1. Ability to start up and operate e-commerce website.
2. Familiarization with online payment services and different cyber laws.
3. Ability to understand customer relationship life.
4. Knowledge of cyber world and scope of cyber laws in E-commerce.
5. To study the application of Electronic Data Interchange

Semester IV

Entrepreneurship & Skill Development

Course Outcome

1. Students will be able to define, identify and/or apply the principles of entrepreneurial and family business;
2. Students will be able to define, identify and/or apply the principles of viability of businesses, new business proposals, and opportunities within existing businesses;
3. Students will be able to define, identify and/or apply the principles of entrepreneurial management and growth through strategic plans, consulting projects and/or implementing their own businesses;
4. Students will be able to define, identify and/or apply the principles of preparing a start-up business plan emphasizing financing, marketing, and organizing;
5. Students will be able to define, identify and/or apply the principles of creating and defending an entrepreneurial marketing plan;
6. Students will be able to define, identify and/or apply the principles of developing pro forma financial statements;

Sales & Distribution Management

Course Outcome

1. Understand the roles and responsibilities of the Sales Managers
2. Manage and enhance the sales force productivity and performance
3. Plan and implement an effective sales strategy for their organizations.
4. Design and implement distribution channel strategy.
5. Manage the Channels efficiency and effectiveness; wholesaling, and retailing.

Co-operative Management

Course Outcome

1. Communicate Concept and Characteristics of Cooperatives,
2. Explain Functional and Management aspects of Cooperatives
3. Organize a cooperative institution based upon grassroots level after analyzing market condition

International Financing

Course Outcome

1. Knowledge about IMF, World Bank, European Monetary System and their role in international financial management.
2. Clarity about the role of central bank in international financial management.
3. Ability to use various scanning techniques to scan the environment of host country.
4. Understanding of the manner of management of exposures involved in international transactions.

Department of Microbiology(2020-21):-

Program Outcomes, Program specific Outcomes and Course Outcomes:-

Program Outcomes: M.Sc.Microbiology / Ph.D. Degree (UG/PG/ Ph.D. Degree Program).

Course Outcomes:-M.Sc. Microbiology

M. Sc. I/Sem I:- Microbial Techniques (Paper I)

1. Student are trained in various techniques of Electrophoresis and chromatography.

2. This particular course deals with the working of various advanced techniques in Microbiology and Molecular Biology.

3. Students are acquainted with basics of of Spectroscopy, IR Spectroscopy, Flame photometry.

4. Getting the idea about Isotopic tracer tech.

5. Students are trained with the knowledge to handle microbes and basic instrumentation used in microbiological laboratory.

6. Understanding of various basic techniques to isolate, characterize the microbes morphologically.

M. Sc. I/Sem I:-Microbial Enzymology (Paper II)

1. This paper develops in the students' mind a concept regarding the diversity of metabolic processes occurring in biological system.

2. Understanding of effect of the structural and functional role of the enzymes governing the metabolic processes.

3. Importance of the metabolic pathways in maintaining homeostasis in biological system.

4. This particular paper helps in understanding the basic concepts on Enzymes.

5. Students are acquainted with techniques of Enzyme Isolation and Purification.

6. Understanding the knowledge of Mechanism of Enzyme action.

7. Getting the idea about effect of pH, temp., substrate on enzyme action.

8 The importance of enzymes as a regulatory molecule in metabolism.

M. Sc. I/Sem I:-Microbial Physiology and Photosnthesis (Paper III)

1. Understand the microbial transport systems and the modes and mechanisms of energy conservation in microbial metabolism– Autotrophy and heterotrophy

2. Know the various Physical and Chemical growth requirements of bacteria and get equipped with various methods of bacterial growth measurement.

3. This particular paper helps in understanding the bacterial and mitochondrial respiration.

4. On the completion of this paper, student will be able to get the overview of classes of cells and structural and function aspects of plasma membrane and cell organelle.

5. This paper develops in the students' mind a concept regarding the microbial photosynthesis.

6. Besides this, they are acquainted with prokaryotic photosynthetic machinery in detail and the knowledge gained can be applied for enhancing the efficiency of plants.

M. Sc. I/Sem I:- Environmental & Agriculture Microbiology (Paper IV)

1. This particular paper acquaints students with the concept of ecology and its importance for existence of various species on the planet.

2. Student after studying the course will be having knowledge of microbes and their importance, application in day to day life with special reference to environmental sustainability.

3. Competently explain various aspects of environmental microbiology and microbial ecology and to become familiar with current research in environmental microbiology.

4. Understand various biogeochemical cycles – Carbon, Nitrogen, Phosphorus cycles and sulfur cycle

5. Understand various plant microbes interactions especially rhizosphere, phyllosphere and mycorrhizae and their applications especially the biofertilizers and their production techniques

6. Understand the basic principles of environment microbiology and be able to apply these principles to understanding and solving environmental problems – waste water treatment and bioremediation

M. Sc. I/Sem II:- Biostatistics, Bioinformatics and Computer Applications (Paper V)

1. This paper acquaints the students with the various types of statistical packages, softwares and use of statistics in research.

2. It imparts knowledge on the use of computers for bioinformatics, a science that is gaining importance day by day.

3. Student will be able to apply statistics to the experiments being carried out by them.

4. On completion of the course the students will possess knowledge of biostatistics to handle and analysis of bulk data in a significant way.

M. Sc. I/Sem II:- Enzyme Technology (Paper VI)

1. This particular paper helps in understanding the basic concepts on Enzyme specificity.

2. Students are acquainted with various measures to control Enzyme action.

3. Understanding the knowledge of Methods Immobilization of microbial enzymes..

4. Getting the idea about Enzyme engineering.

5. Students are trained with the applications of microbial enzymes.

6. Application of enzymes in large scale industrial processes.

M. Sc. I/Sem II:- Microbial Metabolism (Paper VII)

1. This paper helps in understanding the basic knowledge of major biomolecules carbohydrates, lipids, proteins and nucleic acid which help in techniques used in biochemistry and research.

2.Overview of major biomolecules –carbohydrates, lipids, proteins, aminoacids, nucleic acids, classification, structure, function of the above mentioned biomolecules

3. Discuss the biosynthesis and the degradation pathways involved.

4. Specify the biological significance of biomolecules in metabolism

5. This paper provides basis to understand the biosynthesis and the degradation pathways involved.

M. Sc. I/Sem II:- Environmental Microbiology and Extremophiles (Paper VIII)

1.This paper deals with concept of Recalcitrant and biomagnifications.

2.Students are acquainted with Eutrophication and its management.

3. Its an advanced course where students know about the microbes in extreme environment, their mode of functioning under stress.

4. Students gain the basic background of handling wastewater and its treatment.

5. Besides this student are acquainted with the deterioration or transformation caused by microbes and its management which is again an important field of Microbiology.

6.Management of wastewater using various techniques.

7. Overview on concept of Indicator organisms in water.

8.Students are trained in bacteriological analysis of water and in water treatment processes.

M. Sc. II/Sem III:- Molecular Biology (Paper IX)

1. This paper provides basic information of molecular biology.

 2.Know the terms and terminologies related to molecular biology.

3.Students understand the properties, structure and function of genes in living organisms at the molecular level

4. Explain the significance of central dogma of gene action.

5. Have a conceptual knowledge about DNA as a genetic material, enzymes and replication strategies.

6.Understand the molecular mechanisms involved in transcription and translation.

7. Students gain ideas of molecular mechanisms underlying mutations, detection of mutations and DNA damage and repair mechanisms.

8. Explains the concept of recombination, linkage mapping and elucidate the gene transfer mechanisms in prokaryotes.

M. Sc. II/Sem III:- Virology (Paper X)

1. On the completion of course student acquires sound knowledge on various historical aspects of Viruses.

2. Students know how viruses are classified.

3. Understand the architecture, replication of viruses.

4. Comprehend the intricate interaction between viruses and host cells.

5. Know the methods used in studying viruses.

6. The student acquires an adequate knowledge and could co relates the human body to the parameters that have clinical importance.

7. Students understand the detailed account on important pathogenic viruses.

8. Understand the interactions between viruses and the host immune system.

9. Explain vaccine strategies and mechanisms of antiviral drugs and interferons.

M. Sc. II/Sem III:-Fermentation Technology (Paper XI)

1. The students obtain the advanced knowledge to work in fermentation industries.

2. Understand the beneficial role of microorganisms in fermented foods and in food processing and the microbiology of different types of fermented food products – Cottage and Cheddar cheese, Yoghurt and Dahi, Soya Sauce.

3. The students obtain the advanced knowledge on alcoholic beverages and Whisky.

4. Understand the significance and activities of microorganisms in food and role of intrinsic and extrinsic factors on growth and survival of microorganisms in foods.

5. Know the spoilage mechanisms in foods and thus identify methods to control deterioration and Spoilage.

6. Learn the characteristics of important pathogens and spoilage microorganisms in foods.

7. Get equipped with a theoretical and practical understanding of industrial production of antibiotics-Penlcillin, Streptomycin and Tetracycline.

8. The students obtain the advanced knowledge on anticancer agents.

M. Sc. II/Sem III:- Immunology (Paper XII)

1. This paper demonstrates an understanding of key concepts in immunology.

2. Understand the overall organization of the immune system.

3. Conceptualize roles of B lymphocytes/cells and the antigen receptor in T cells.

4. Learn how "clonal selection" allows for the expansion of a limited number of antigen-recognizing lymphocytes in response to an specific antigenic stimulus.

5. Students are acquainted the significance of maintaining a state of immune tolerance sufficient to prevent the emergence of autoimmunity.

6. Understand about Tumor Immunology and help the students to understand its immune prophylaxis and immune therapy.

7. The students obtain the advanced knowledge on salient features of antigen antibody reaction & its uses in diagnostics and various other studies.

8. Students learn about immunization and their preparation and its importance

9. Students are acquainted with concepts on Immunobiotechnology and Hybridoma Technology

M. Sc. II/Sem IV:- Biotechnology (Paper XIII)

1. Students are acquainted with some applied aspects in microbiology to create awareness and more interest in the subject.

2. Know the basics and concepts of various biotechnological related terms.

3. The students obtain the advanced knowledge on the physiological processes that occur during plant growth and development.

4. Understand the methodology involved in plant tissue culture and plant transgenics.

5. Know the issues related to plant nutrition, quality improvement, environmental adaptation, transgenic crops and their use in agriculture

6. On completion of the course the scholars acquires knowledge on the concepts and terminology in genetic engineering.

7 Students are made familiar with various cloning strategies in prokaryotes as well as in eukaryotes.

8. Students learn various techniques in genetic engineering.

9. They also get awareness about the social and ethical issues concerning cloning by genetic engineering.

10. Students are trained in applications of biotechnology and genetic engineering.

11. Students obtain knowledge on wide-ranging topics related to applications of biotechnology in industries.

M. Sc. II/Sem IV:- Clinical Virology (Paper XIV)

1. Students understand the detailed account on classification, life cycle and replication of plant viruses ((TMV, Cynophages, Mycoviruses).

2. On the completion of course student acquires sound knowledge on structure, replication and life cycle bacterial viruses.

3. Explain vaccine strategies and mechanisms of viroids, prions.

4. After completing the course students have a detailed understanding of the terms Oncogenes and tumor suppressor genes, and how tumor viruses interact with these products and their intersecting pathways and cause oncogenesis.

M. Sc. II/Sem IV:- Microbial Technology (Paper XV)

1. This particular course deals with the working of various advanced techniques in Microbiology

2. Student know the use of various advanced microbial techniques for application in various fields.

3. Students get equipped with modern trends in industrial production of bioplastic, biopolymer.

4. Students are acquainted with theoretical and practical understanding of industrial production of organic acids.

5. Appreciate how microbiology is applied in manufacture of industrial products.

6. Know how to source for microorganisms of industrial importance from the environment.

7. Know about enzyme biotechnology -design of bioreactors, factors affecting growth and production, heat transfer, oxygen transfer.

8. Understand the detailed knowledge on biofertilizers and biopestcides

M. Sc. II/Sem IV:- Medical Microbiology (Paper XVI)

1. It provides knowledge of pathogenic microorganisms, their characterization, pathogenesis and control.

2. Student can safeguard himself & society and can work in diagnostics labs.and hospitals.

3. This course provides learning opportunities in the basic principles of medical microbiology and infectious disease.

4. It covers mechanisms of infectious disease transmission, principles of aseptic practice, and the role of the human body's normal microflora.

5. The course provides the conceptual basis for understanding pathogenic microorganisms and the mechanisms by which they cause disease in the human body.

6. It also provides opportunities to develop informatics and diagnostic skills, including the use and interpretation of laboratory tests in the diagnosis of infectious diseases.

7. Understand the importance of pathogenic microorganisms in human disease with respect to infections of the respiratory tract, gastrointestinal tract, urinary tract, skin and soft tissue.

8. Explain the methods of microorganisms control, e.g. chemotherapy & vaccines.

Course Outcomes:-Ph.D. Microbiology

1. Students develop the skill to think independently, plan research and execute it in different fields of Microbiology.

2. Students develop the skill to think independently and execute it in entrepreneurship and become job providers.

3. Students can excel in academics, consultancy, industry and pollution control boards, industry as well as policy makers.

4. Students can make impactful contributions in the field for the development of nation as a whole.

5. After successful completion of Pre-Ph.D course students are acquainted with the research methodology, and scientific conduct, ethics and morality in research and publication.

6. Also it focuses on plagiarism.

Department of Microbiology(2020-21):-

Program Outcomes, Program specific Outcomes and Course Outcomes:-

Program Outcomes: B.Sc. (UG Program).

1. Students pass out this program become expertise in hands-on practice.

2. Students will acquire knowledge and laboratory skills applicable to microbiological research or clinical methods.

3. Students can opt for job or training courses.

4. This Program inculcates scientific thinking and awareness among the student.

5. Research aptitude is also developed in the minds of budding generation.

6. After PG program, students develop concept of set up of small scale industries, develop confidence to tasks of research in the field of Microbiology.

7. After PG program, Students learn to integrate science with society for the overall development of the nation.

8. After Ph.D. program, Students develop the skill to think independently, plan research and execute it in different fields of Microbiology.

9. After Ph.D. program,students may opt for entrepreneurship and become job providers.

10.Microbiology students can excel in academics, consultancy, industry and pollution control boards, as well as in industry.

11.These students make many contributions in the field for the development of nation as a whole.

Program specific Outcomes:- B.Sc. /M.Sc.Microbiology/ Ph.D. Degree (UG/PG/ Ph.D. Degree Program).

1. Students acquire ability to use laboratory instruments like Autoclave,Bacteriological Incubator,Hot air oven, spectrophotometer, colorimeter, Laminar AirFlow system, PH meter, Electrophoresis apparatus, Compound microscope,Centrifuge during graduation.

2.Such studies instill techniques of isolation and cultivation of microorganisms from their natural habitat like air ,water, soil as well as specimens collected from patients.

3.Studies in Microbiology help to opt for career in a pharmaceutical companies,industries,pathology Laboratories,Dairy and medical related business or industries.

4.Acquire ability to plan and establish the small-to-mid-size their own industries and laboratories.

5.Knowledge can be applied to improve and develop processes or systems utilizing microorganisms based industries.

6. knowledge of microorganisms may be used to solve environmentalproblems.

Course Outcomes:-B.Sc. Microbiology

B. Sc. I/Sem I:- Fundamentals of Microbiology and Microbial Physiology (Paper I)

1. Introduction to techniques of Microscopy and Staining

2. Awareness about basic knowledge of microbiology.

3. Understanding of scope of microbiology.

4. Getting the idea about control of Microorganisms.

5. Students are acquainted with prokaryotic bacterial cell in detail and the knowledge gained can be applied for further studies.

B. Sc. I/Sem II:- Microbiology,Biochemistry,Biostatistics and Computer (Paper II)

1. Understanding the structure, Morphology, Cultivation and Replication of Viruses.

2. Brief ideas about different types of Microorganisms.

3. Demonstrating and educating different applied areas in microbiology.

4. Students are acquainted with the basics of biostatistics and computers, a science that is of utmost use in fast changing world of research.

B.Sc II /Sem III:- Molecular Biology and Genetic Engineering: (Paper III)

1. Understanding theknowledge in Molecular Biology, and Genetic engineering and acquire ability to apply in various fields.

2. This paper acquaints the student with detailed study of genetic material in prokaryotes, mutations, reproduction which are of importance for applying the knowledge in research.

3. Students are educated andtrainedforvariousadvanced molecular biology techniques and the knowledge gained is helpful to get a job in molecular biology laboratories and the knowledge can be applied for advancedresearch.

B.Sc II /Sem IV:- Medical Microbiology (Paper IV)

1. Studying and understanding detailed knowledge of causative agents/pathogens, diseases and their control.

2. 2.Students are educated with underlying principles of immunology and its application in solving problems in humans.

3. Students are acquainted with immune mechanisms that protect against pathogens and the implication for vaccine development useful tohealth.

4.Studying detailed knowledge ofviral diseases in humans.

5.Students are acquainted with basics of Epidemiology.

B. Sc III Sem V:-Environmental Microbiology and Bioinstrumentation(Paper V)

1. This paper deals with understanding the knowledge of environmental microbiology and pollution.

2. Students are acquainted with basics of assessment of water.

3. Students are educated torecognize the polluted water and treatment using proper methods.

4. This paper deals with details of Air and Soil Microbiology.

5. Understanding the knowledge of wastewater management using various methods.

6. This paper also focuses on various analytical instruments and techniques that a student should know to pursue higher studies.

B. Sc III Sem VI:-Industrial Fermentations, Food Microbiology and Metabolism (Paper VI)

1. Students learn concepts and techniques in the area of Industrial Microbiology.

2. This helps students in finding a job in fermentation based industry.

 3. Students are charged with the concepts of fermentation to set up small scale industries.

4.Thus, students learn to integrate science with society for the overall development of the nation.

5.Students understand the classification of industrial products and theiruse.

6.This course also acquaints students with food products, their production techniques and prevention ofspoilage.

7.Student are trained to undertake job in food industries.

8.This course is coupled to an industrial visit also.

7. Scholar learns to formulate the research proposal while maintain the duplication.

Adarsha Science, J. B. Arts and Birla Commerce Mahavidyalaya, Dhamangaon (Rly)

Department of Physics (2020-21)

Program Outcomes, Program specific Outcomes and Course Outcomes

Department of Physics	After successful completion of three year degree program in physics a student should be able to;
Program Ourtcomes	1) Use his knowledge to analyze new situations and learn skills and tools like mathematics, engineering and technology to find the solution, interpret the results and make predictions for the future developments.
	2) Identify and apply appropriate physical principles and methodologies to solve a wide range of problems associated with Physics.
	3) Plan and execute Physics-related experiments or investigations.
	4) Create an awareness of the impact of Physics on the society.
	5) Use modern techniques, decent equipments.
Program specific outcomes	1) Gain the knowledge of Physics through theory and practical's.
	2) Identify their area of interest in academic and R&D.
	3) Understand good laboratory practices and safety.
	4) Acquire analytical and logical skill for higher Education.
	5) Pursue master degree in Science i.e. M.Sc, work in research related fields and can even look for professional job oriented courses.

Course Outcomes		
Course	**Broad Contents**	**Outcomes**
B.Sc (I) Sem I (Physics)	1) Mechanics 2) Waves and Oscillations 3) Properties of matter	1) Apply Kepler's law to describe the motion of planets and satellite in circular orbit, through the study of law of Gravitation. 2) Write the expression for the moment of inertia about the given axis of symmetry for different uniform mass distributions. 3) Explain the phenomena of simple harmonic motion and the properties of systems executing such motions. 4) Learn the fundamentals of harmonic oscillator model, including damped and forced oscillators. 5) Describe the production, detection of ultrasonic waves and applications 6) Know the basic principles of properties of matter. 7) Understand the principles of elasticity through the study of Young Modulus and modulus of rigidity. 8) Understand simple principles of fluid flow and the equations governing fluid dynamics. 9) Compare the viscosity and interfacial surface tension between the liquids 10) Solve numerical problems involving topics covered. 11) In the laboratory course, the student perform the experiments related to mechanics (compound pendulum), rotational dynamics (Flywheel), and elastic properties (Young Modulus and Modulus of Rigidity).

B.Sc (I) Sem II (Physics)	1) Kinetic theory of gases 2) Thermodynamics 3) Motion of electron in electric and magnetic field 4) Network theorem 5) Alternating currents	1) Learn the basic aspects of kinetic theory of gases, Maxwell-Boltzman distribution law, equitation of energies, mean free path of molecular collisions, viscosity, thermal conductivity, diffusion and Brownian motion. 2) Differentiate the terms heat and temperature and measure temperature using thermometer and convert one scale of temperature to another scale. 3) Comprehend the basic concepts of thermodynamics, the first and the second law of thermodynamics, the concept of entropy and the associated theorems, the thermodynamic potentials and their physical interpretations. 4) Learn about the real gas equations, Van der Waal equation of state. 5) Learn about Maxwell's thermodynamic relations and Joule – Thomson effect. 6) Differentiate between principles and methods to produce low temperature, liquefy air, helium and hydrogen 7) Learn about motion of electron in electric and magnetic field. 8) Recognize the motion of the charged particle in electromagnetic field. 9) To learn the basic principles of working of linear accelerator, mass spectrograph and cyclotron. 10) Apply Kirchhoff's rules to analyze AC circuits consisting of parallel and/or series combinations of voltage sources and resistors and to describe the graphical relationship of resistance, capacitor and inductor. 11) Apply various network theorems such as Superposition, Thevenin, Norton, Maximum Power Transfer, etc. and their applications in electronics, electrical circuit analysis. 12) Compare the principles and working of different types of galvanometer 13) To learn to solve a.c. circuit using j – operator. 14) Apply and analyze the behaviour of ac circuits based on L,C and R 15) To learn the basic principle of working of transformer. 16) Solve numerical problems involving topics covered. 17) In the laboratory course, the students perform the experiments related to network theorems, RLC circuit, transformer etc.
B.Sc (II) Sem III (Physics)	1) Mathematical background of Physics 2) Electrodynamics 3) Solid state Electronic devices 4) Special theory of relativity 5) Atmosphere and Geophysics	1) Understand vector calculus in three dimensions and derive Gauss theorem, Stoke's theorem and Green's theorem. 2) Demonstrate Gauss law, Coulomb's law for the electric field, and apply it to systems of point charges as well as line, surface, and volume distributions of charges. 3) Explain and differentiate the vector (electric fields, Coulomb's law) and scalar (electric potential, electric potential energy) formalisms of electrostatics. 4) Apply Gauss's law of electrostatics to solve a variety of problems. 5) Explain Faraday-Lenz and Maxwell laws to articulate the relationship between electric and magnetic fields.

		6) Understand the unification of electric and magnetic fields and Maxwell"s equations governing EM waves.
		7) Understand the physics of semiconductors.
		8) Understand the structure, working and applications of different semiconductor devices such as, P – N junction diode, LED, Varactor diode, transistors and FET.
		9) To study the Operational Amplifier and their applications.
		10) To understand the Special Theory of Relativity.
		11) Describe special relativistic effects and their effects on the mass and energy of a moving object.
		12) Understand the structure of earth.
		13) Understand the composition of atmosphere.
		14) Understand causes and technologies associated with earthquake.
		15) Understand the mechanism of production of cloud.
		16) Solve numerical problems involving topics covered.
		17) In the laboratory course, the student perform the experiments related to Electronics (P – N junction diode, Zener diode, BJT, FET, OP – AMP etc.)
B.Sc (II) Sem IV (Physics)	1) Optics 2) Laser 3) Fiber optics 4) Renewable energy sources	1) Use the principles of wave motion and superposition to explain the Physics of polarisation, interference and diffraction.
		2) Understand the working of selected optical instruments like prism, diffraction grating, and holograms.
		3) In the laboratory course, student will gain hands-on experience of using various optical instruments and making measurements of wavelength of light using Newton Rings experiment,diffraction grating etc.
		4) Know the basic concepts in LASER, basic principle and working of different types of lasers such as He – Ne laser, Ruby laser and semiconductor laser and know the applications of lasers in various fields.
		5) Understand the basic principle (total internal reflection) behind the working of optical fiber.
		6) Understand the structure, types and applications of optical fibers.
		7) To understand various renewable energy sources – Solar energy, Wind energy, ocean energy- Waves & tides, geothermal energy, Hybrid Systems, Hydrogen energy systems, Fuel cells
		8) Understanding of fundamentals of PV cells and systems.
		11) Solve numerical problems involving topics covered.
		12) In the laboratory course, the students perform the experiments related to optics, solar cell etc.
B.Sc (III) Sem V (Physics)	1) Quantum Mechanics 2) Atomic and molecular spectroscopy 3) Nucleay Physics 4) Electronics	1) Know main aspects of the inadequacies of classical mechanics and understand historical development of quantum mechanics and ability to discuss and interpret experiments that reveal the dual nature of matter.
		2) Understand the theory of quantum measurements, wave packets and uncertainty principle.
		3) Understand the central concepts of quantum mechanics:

		wave functions, momentum and energy operator, the Schrodinger equation, time dependent and time independent cases, probability density and the normalization techniques, skill development on problem solving e.g. one dimensional rigid box, tunneling through potential barrier etc.
		4) Understand vector atom model, coupling schemes, emission and absorption spectra.
		5) Understand basic principle, types and applications of X – rays.
		6) Understand the Raman effect and its theory.
		7) Understanding the properties of nuclei like density, size, binding energy, nuclear forces and structure of atomic nucleus, liquid drop model and nuclear shell model and mass formula.
		8) Understand alpha, beta and gamma decay, Neutrinos and its properties and role in theory of beta decay.
		9) Understand fission and fusion well as nuclear processes to produce nuclear energy in nuclear reactor.
		10) Explain hybrid parameter model of amplifier.
		11) Design of h – parameter equivalent circuit of CE amplifier and to analyze it.
		12) Design and explain the circuit of RC coupled amplifier and to study its frequency response.
		13) Explaining different noises and distortions in amplifier circuits.
		14) Understanding the effect of feedback on amplifier circuit.
		15) Design and understand the working of different oscillator circuits such as Hartley oscillator, Colpitt's oscillator, Phase shift oscillator and Wein bridge oscillator.
		16) Design and understand the working of multivibrator circuits (Astable, monostable and bistable).
		17) Solve numerical problems involving topics covered.
		18) In the laboratory course, the students perform the experiments related to oscillators, multivibrators, feedback amplifiers etc.
B.Sc (III) Sem VI (Physics)	1) Statistical Mechanics 2) Crystallography 3) Electric and Magnetic properties of materials 4) Superconductivity 5) Nanotechnology	1) Understand the concepts of microstate, macrostate, ensemble, phase space, thermodynamic probability and partition function.
		2) Understand three different distribution laws e.g. Maxwell-Boltzmann distribution, Bose-Einstein distribution and Fermi-Dirac distribution laws of particles and their derivation.
		3) Understanding the difference between crystalline and amorphous solids.
		4) To understand the principles and techniques of X-rays diffraction.
		5) Understanding of the defects in solids.
		6) Understanding of electrical properties of materials.
		7) Understanding the band structure in solids and classification of solids depending on their band structure.
		8) To give an extended knowledge about magnetic properties like diamagnetic, paramagnetic, and ferromagnetic.

		9) Understanding of classical and quantum theory of diamagnetic and paramagnetic materials.
		10) Understanding of Hysteresis in ferromagnetic materials.
		11) Understanding of basic concepts and applications of superconductors.
		12) Understanding of history, theory and applications of nano – materials.
		13) Solve numerical problems involving topics covered.
		14) In the laboratory course, the students perform the experiments related to solid state physics.

Dr. S. G. Onkar

Head, Department of Physics

DEPARTMENT OF POLITICAL SCIENCE

B.A. Program Outcomes

- The program under Arts faculty are broadly categorized into Languages and Social Sciences.
- The students acquire knowledge in the field of social sciences, literature and humanities which make them sensitive and sensible enough.
- The B.A. graduates will be acquainted with the social, economical, historical, political, ideological and tradition and thinking.
- The program also empowers the graduates to appear for various competitive examinations or choose the post graduate program of their choice.
- The B. A. program enables the students to acquire the knowledge with human values framing the base to deal with various problems in life with courage and humanity.
- The students will be ignited enough to think and act over for the solution of various issues prevailed in the human life to make this world better than ever.
- Understand the issues of environmental contexts and sustainable development.
- To make student able to realize the importance of human values.
- To make student aware regarding social service.

Department of Political Science Program Specific Outcomes

1) Acquiring knowledge of Constitution of India.
2) Understanding the political system of our Nation.

3) Understanding the Government mechanism from Gram Panchyat to Parliament- its functions, duties & responsibilities.
4) Acquiring knowledge of political Law.
5) Study from competitive examination point of view.
6) Knowledge about the Indian and Foreign Politics.
7) Knowledge about Political Thought.
8) Knowledge about Comparative constitutional System.

Course outcomes

B. A. I Sem. Course : Indian Constitutional Provisions and Local self Government :

1) Understand the Salient features of the Indian Constitution.

2) To acquire knowledge of Preamble its Objectives, Nature and Importance.

3) Understand the Structure and Powers of Parliament.

4) To comprehend the Structure of Indian Judiciary.

B.A. II Sem. Course : Indian Constitutional Provisions and Local self Government :
1) Understand The Election Commission of India its structure, Function and Powers.

 2) To know about the Eligibility of voters in Loksabha, Vidhansabha and Vidhan Perished Election.

3) To identify the Structure, Power and Function of Municipal Corporation, Gram Panchayat and Gram Sabah.

4) To evaluate Women's Participations in Panchayat Raj of Maharashtra.

B.A. III Sem. Course : Selected Constitutions and International Relations)(U.K., U.S.A. & China) :

1) Understand Salient Features of the Constitution of U.K. and U.S.A.

2) To study and analyze Historical Background of Crown and its power.

3) To evaluate the process of Prime Minister's Appointment, Role and Function.

4) To compare Parliamentary System of U.K.

5) Understand Judiciary and the Election Process, Powers and Function of U.S.A. President.

B.A. IV Sem. Course : Selected Constitutions and International Relations)(China, UNO) :

1) Understand Salient Features of the Constitution of China.

2) To Comprehend Composition, Powers and Functions of National People Congress.

3) To study and analyze Composition, Powers and functions of Standing Committee.

4) To evaluate the process of Appointment, Function and Role of President of China.

5) To study and analyze Charter, Aims and Basic Principles of United Nation Organization.

B.A. V Sem. Course : Modern Concepts and Policy in Politics :

1) Understand Meaning, Factors and Role of Leadership.

2) To comprehend Meaning and Nature of Indian Reservation Policy.

3) To study and analyze Meaning and nature of Nationalism.

4) Understand Meaning and Role of Communalism.

5) Understand Meaning and Definition of Terrorism.

B.A. VI Sem. Course : Concepts of Western and Indian Thinkers :

1) To study and analyze Aristotle's Classification of state.

2) Comprehend M.K. Gandhi's Concept of Ramrajya.

3) Understand Walter Bagehot's, and Abraham Lincoln's Concept of Democracy.

4) Understand Dr. B. R. Ambedkar's Parliamentary Democracy.

5) To study and analyze Karl Marx's concept of Socialism.

The programme Develops youth force as trained& disciplined leadership. Students will have the knowledge about Disaster Management. The student will get knowledge of Drill with Arms as a military training elementary aspect. The student will get knowledge of field signals, section and platoon formation, and art of using ground and the available weapon as a military training elementary aspect. Employability in defense, paramilitary forces and other services. Enhancement of skill and patriotic values among youth.

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Department of Sanskrit
2020-2021 (Criteria –II)

B. A. (SANSKRIT)
Specific Outcomes
B. A. I, B. A. II, B. A. III (SANSKRIT LITERATURE)

    1. Students graduating in this course can understand the linguistic features and literary aspects of Sanskrit Language.

    2. Students will understand the moral and social values in ancient Sanskrit literature.

    3. Students can develop their interest in Sanskrit and thus work to rejuvenate the language.

    4. They can go for Post Graduate Couse in Sanskrit.

B. A. (SANSKRIT)
Course Outcomes (CO's)

B. A. 1st Year (Sem. I)
  A. Natakam
  B. Information about poets and writers
      1. Students will develop interest in Sanskrit Natakas.
      2. Students will capture the good knowledge of ancient writers and their literature.

B. A. 1st Year (Sem. II)
  A. Nitishatakam
  B. Grammer of Ashtadhyee (According to Paniniya)
      1. Students can understand that moral values to reflect in Sanskrit literature.

2. Students will understand the grammar rules of Sanskrit Language.
3. Students will become a capable to speak in Sanskrit.

B. A. 2nd Year (Sem. III)

A. Natakam (Kalidasa's)

B. Grammar based on Ashtadhyee

C. Information about writers

1. Traditional Knowledge provides the students
2. Students will understand the ethics and values in Sanskrit literature.
3. Students will gain the knowledge about cultural, religion & personality development.

B. A. 2nd Year (Sem. IV)

A. Kavyaprakash (Mammath's)

B. Suryashatakam

C. Information about writers

1. It aims to provide subject related knowledge skills.
2. To build the ability of students to clearly express their thoughts and feelings.
3. Students will be acquainted with the ideological and philosophical tradition and thinking.

B. A. 3rd Year (Sem. V)

A. Natakam (Kalidas's)

B. Grammar based on Ashtadhyee

C. Information about writers

1. This information makes changes in their personal and professional behaviour.

2. They can achieve their career by acquire these knowledge.

B. A. 3rd Year (Sem. VI)

A. Harshacharitam
B. Alankar (Kavyaprakash – 10th Ullas)
C. Information about writers and poets
    1. After completion of Bachelor Degree with Sanskrit Literation, changes are reflecting on their behaviour.
    2. At the resultant, human learned and proved himself/herself as wise person in the society.
    3. Computer language develops the logical thinking, programming in the Sanskrit.

Dr. Poonam Gahukar
HOD Sanskrit Department

NAAC CRITERIA

SUBJECT: ZOOLOGY

Program Outcomes: (B.Sc.):

On completion of B.Sc. degree academically a student is empowered with

- **Critical Thinking:** The students begin to introspect on their own preconceived notions in light of contrary but reliable observations. Graduating students develop the ability to analyse and assess a phenomenon objectively so that an unbiased judgement can be made. The students begin to unravel fallacies and bad reasoning so that cooperative reasoning can blossom.

- **Hands on Laboratory Experience:** Students are able to perform basic laboratory protocols following sound scientific methods with minimum error. Should develop a thorough understanding behind logic and theory of using different stains for different structures and components.

- **Individual and Team work:** Students are able to come up with new ideas that address current local problems and take initiative in formulating solutions through spreading awareness. Students should also be able to work in cohesion as a team so that constructive tasks are performed.

- **Bibliographic Search:** Students are able to employ modern literature survey and retrieval methods to obtain information about concepts, scientific techniques and natural phenomena.

- **Effective Communication:** Communication on complex scientific topics through effective reports and design documents.

- **Academic Integrity & Ethics:** Graduate education is a multifaceted enterprise, but its purpose is to prepare student to be professionals capable of teaching and conducting research that is ethically sound.

- **Social Responsibility:** The students is able to bring about positive change in society through awareness campaigns, speeches, dialogue and social outreach especially to underprivileged.

- **Life-long Learning:** The student may leave the institution but does not relinquish learning and augments the traditional wisdom of society with modern scientific knowledge imparted through formal educational programme.

- **Analytical skills** – Begins to understand, interpret and manipulate complex scientific data and statistics

- **Data-handling skills** – Learns to record, collate and analyse data using appropriate techniques and equipment

- **Project management skills** - organising and undertaking research projects and experiments (including budgeting, contingency planning and time management) developing a good competence of information technology along the way

Job opportunities: after completion of B.Sc. degree with Zoology a student can be offered for jobs in the following fields.

- Animal nutritionist

- Ecologist

- Environmental consultant

- Field trials officer

- Nature conservation officer

- Science writer

- Zookeeper

- Zoologist

Program Specific Outcomes:

- Understand the nature and basic concepts of chordate, non-chordate, evolution, genetics, ecology, Animal physiology, economic zoology and molecular biology and biotechnology

- Analyse the relationship among animals, plants and microbes to develop a synergistic/ integrated view of the biosphere.

- Perform experiments as per laboratory standards in the different areas of zoology

- Demonstrated a broad understood of animal diversity

- Gain knowledge about various tools & techniques used in biological systems and gives them insight about their use in research.

- Understand the complex evolutionary processes; origin and development of animals.

- How zoological principles can be applied to problems in public health and Hygiene, conservation and applied biology.

Course Outcomes: (Paper Wise):

Semester – I

Life and Diversity of Non-chordata

- Understand the diversity of Non-Chordata, its systematic position and how they contributed for the evolution of complex organisms

- Understand the anatomical features of non-chordates through type study.

- Generate an idea about minor phyla

Semester – II

Cell Biology

- Understand basic knowledge about cell with reference to its structure and function at molecular level including signalling and proliferation in prokaryotic and eukaryotic organisms.

- Able to draw the structure of cell organelles and locate its parts along with functions

- Explain the organization of genes & chromosomes

- Compare and contrast the events of cell cycle and its regulation

- Summarize the definition, sources and applications of stem cells

Developmental Biology

- Explain the process of development in general

- Distinguish the various process involved in animal development

- Comprehends different events in gametogenesis

- Gain knowledge about structure, types and functions of placenta

- Recognizes different modes of reproduction like parthenogenesis

- Able to explain the mechanism in regeneration of vertebrate. and invertebrates

Semester – III

Life and Diversity of Non-Chordata & Concept of Evolution

- Observe the diversity in chordates and their classification

- Analyse the significant adaptive features in fishes

- Understand anatomical and physiological aspects through type study

- Appreciate transitional stages and their significance in evolution

- Create a positive attitude towards conservation of biodiversity

- Understand natural selection as an evolutionary process and its significant role

- Obtained the knowledge about direct observation of fossils and evolutionary important specimen by which evolutionary relationship of animal groups can be design

Semester – IV

Advanced Genetics

- Understand the role of genes as dominant, recessive and interaction of genes through Mendel's laws

- Understand significant importance of linkage and crossing over in variation of population

- Understanding of genetic methodology and how quantification of heritable traits in families and populations provides insight into cellular and molecular mechanisms

- Understanding how genetic concepts affect broad societal issues including health and diseases, food, environmental sustainability etc.

- The knowledge required designing, executing and analysing the results of genetic experiments in animal and plants model system

- The ability to evaluate conclusions based on genetic data

Animal Ecology

- Discuss, evaluate and apply scientific principles to the ecology and conservation

- Apply a conceptual framework to solve problems in animal ecology

- Characterize the chemical and physical features of environment of animals and pressure exerted by these features on the later.

- Develop holistic view of biosphere, building up from local ecosystems so that the importance of organisms in each others lives is manifested

Semester –V

Animal Physiology

- Outline the basic control process of the nervous system and explains how it drives the muscle movement and sensory perceptions

- Recognize structural peculiarities of aquatic and terrestrial respiratory organs, mechanism of physical basis of gaseous exchange and physiological adjustments to enhance ability of blood to transport respiratory gases culminating in release of the latter at their destination sites

- Measure and interpret experimental data and demonstrate laboratory skills in haematological experiments

- Communicate experimental data and a theoretical understanding of animal physiology

- Understand the types of animal tissue and architecture of different organs.

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Economic Zoology

- Develop an understanding with reference to insect pests, beneficial insects, aquaculture, integrated fish farming, etc

- Students begin to explore the possibility of setting up their own small scale industry by utilizing the knowledge gained through economic zoology so that they become job givers instead of job seekers

Semester – VI

Molecular Biology and Biotechnology

- Understood the blue print of life i.e. DNA, its types, its experimentation and its importance in conducting molecular biology experiments

- Comprehensive understanding of the chemical basis of heredity

- Develop an insight into how information flows from genes to proteins leading to regulation of cellular processes

- Able to understand recombinant DNA technology along with other techniques in biotechnology

- Gain knowledge about immunity and its different aspects like production of antibodies, complement system and their interactions.

Dr. S. O. Qureshi

Associate Professor & Head

Department of Zoology