

Ahmednagar College

Program Outcome, Program Specific

Outcome and Course Outcome

Department of Business Administration

1. Departmental Profile

Ahmednagar College, the first and the oldest institution of Ahmednagar District. A premier institution of learning for traditional as well as new-age subjects, the name of the college is synonymous with Quality Education. Ahmednagar college opened the gates of Higher Education to the all types of the students irrespective of their caste, religion and race. The Department of Business Administration was established in the year 2005. Post Graduate Courses were started from 2009. The department of Business Administration has its course designed to give a broad knowledge of the functional aspects of a company and their interconnection, while also allowing for specialization in a particular area. B.B.A. programs expose students to a variety of "core subjects" and allow students to specialize in a specific academic area. The degree also develops the student's practical, managerial and communication skills, and business decision-making capability. Many programs incorporate training and practical experience, in the form of case projects, presentations, internships, industrial visits, and interaction with experts from the industry.

Under the leadership of Principal Dr. R. J. Barnabas the department gained its rigor acclaim. Currently Dr.D.B.More is working as a coordinator of the Department.

The department of Business Administration is actively engaged in various activities with the help of students and faculty members. The commerce association is regularly arranging lectures related with trade, commerce, industry, management, taxation & global scenario. Eminent personalities, consultant's resource persons were called for delivering the lectures on related topics.

Business Administration course provides adequate basic understanding about Management Education among the students. It prepares students to exploit opportunities being newly created in the Management Profession. It helps train the students in communication skills effectively. It develops appropriate skills in the students so as to make them competent and provide them self-employment, and inculcates Entrepreneurial skills.

2. Programmes offered

Sr. No.	Programme	Objectives	Programme Specific Objectives
1.	Bachelor of Business Administration (B.B.A.)	PO1. Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books,	<u>F.Y.B.B.A. (Sem – I)</u> Principles of Management : 1. To develop managerial effectiveness through managerial thinking, knowledge of effective. 2. Learning about the management philosophy over the period of time.

Sr. No.	Programme	Objectives	Programme Specific Objectives
		<p>Media and technology.</p> <p>PO2.Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.</p> <p>PO3.Effective Citizenship: Demonstrate empathetic social concern and equity centered national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.</p> <p>PO4.Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.</p> <p>PO5.Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.</p> <p>PO6.Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes</p>	<p>3. How to plan and organise an activity and motivate the group.</p> <p>4. To develop understanding regarding new systems of management.</p> <p>Business communication skills:</p> <ol style="list-style-type: none"> 1. To improve various skills such as linguistic, non-linguistic and Paralinguistic skills. 2. To develop an integrative approach where reading, writing, oral and speaking components are used together to enhance the students' ability to communicate and write effectively. 3. To create awareness among student about Methods and Media of communication. <p>Business Accounting:</p> <ol style="list-style-type: none"> 1. To enable the students to acquire sound knowledge of basic concepts of Accounting. 2. To impart basic accounting knowledge. 3. To impart the knowledge about recording of transactions and preparation of final Accounts. 4. To acquaint the students about accounting software packages <p>Business Economics (MICRO).</p> <ol style="list-style-type: none"> 1. To expose students to basic micro economic concepts. 2. To apply economic analysis in the formulation of business policies. 3. To use economic reasoning to problems of business.

Sr. No.	Programme	Objectives	Programme Specific Objectives
			<p>Business Mathematics.</p> <ol style="list-style-type: none">1. To understand applications of matrices in business.2. To understand the concept and application of Permutations & Combinations in business.3. To use L.P.P. and its applications in business.4. To understand the concept of Transportation problems & its applications in business world.5. To understand the concept of shares & share market. <p>Business Demography.</p> <p>To develop knowledge base for demographic and environmental factors affecting business.</p> <ol style="list-style-type: none">1) To make the students aware of environmental problems related to business and Commerce.2) To inculcate values of Environmental ethics amongst the students. <p>Skill Enhancement Course (Add on Courses).</p> <p>To understand the role of communication for managers.</p> <p>To develop their managerial skills.</p> <p>To make them understand different types of communication used in an organisation.</p> <p><u>S.Y.B.B.A. (SEM – III)</u></p> <p>Personality Development:</p> <ol style="list-style-type: none">1. To make the students aware about the dimensions and importance of effective personality.2. To understand personality traits and formation and vital

			<p>contribution in the world of business .</p> <p>3. To make the students aware about the various dynamics of personality development.</p> <p>Business Ethics:</p> <p>1. To impart knowledge of Business Ethics to the students.</p> <p>2. To promote Ethical Practices in the Business.</p> <p>3. To develop Ethical and Value Based thought process among the future manager's entrepreneurs.</p> <p>Human Resource Management and Organisational Behavior:</p> <p>1. To introduce to the students the functional department of human resource management and acquaint them with planning, its different functions in an organization.</p> <p>2. To introduce the human resource processes that are concerned with planning, motivating and developing suitable employees for the benefit of the organization.</p> <p>Management Accounting:</p> <p>1. To impart basic knowledge of Management Accounting.</p> <p>2. To know the implications of various financial ratios in decision making.</p> <p>3. To study the significance of working capital in business.</p> <p>4. To understand the concept of budgetary control and its application in business.</p> <p>5. To develop the calculating ability of various techniques of management accounting.</p> <p>Business Economics (MACRO):</p> <p>1. To study the behavior of working</p>
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Sr. No.	Programme	Objectives	Programme Specific Objectives
			<p>of the economy as a whole.</p> <p>2. To develop an analytical framework to understand the inter-linkages among the crucial macroeconomic variables.</p> <p>3. To apply economic reasoning to problems of business and public policy.</p> <p>IT in Management :</p> <p>1. To understand the role of IT in Management.</p> <p>2. To understand the basics of operating systems.</p> <p>3. To know the current happenings.</p> <p><u>T.Y.B.B.A. (SEM – V)</u></p> <p>Supply Chain and Logistics Management:</p> <p>1. To introduce the fundamental concepts in Materials and Logistics Management.</p> <p>2. To familiarize with the issues in core functions in materials and logistics management</p> <p>Entrepreneurship Development:</p> <p>1. To create entrepreneurial awareness among the students.</p> <p>2. To help students to up bring out their own business plan.</p> <p>3. To develop knowledge and understanding in creating and managing new venture.</p> <p>Business Law:</p> <p>1. To understand basic legal terms and concepts used in law pertaining to business</p> <p>2. To comprehend applicability of legal principles to situations in Business world by</p>

Sr. No.	Programme	Objectives	Programme Specific Objectives
			<p>referring to few decided leading cases.</p> <p>Research Methodology:</p> <ol style="list-style-type: none">1. To provide the students with basic understanding of research process and tools for the same.2. To provide an understanding of the tools and techniques necessary for research and report writing. <p>Finance Spl – I [Analysis of Financial Statement]:</p> <ol style="list-style-type: none">1. This course is designed to prepare students for interpretation and analysis of financial statements effectively.2. To make the student well acquainted with current financial practices3. This course is designed primarily for students who expect to be intensive users of financial statements as part of their professional responsibilities. <p>Marketing Spl – I [Sales Management] :</p> <ol style="list-style-type: none">1. To provide the students with basic understanding of the processes and skills necessary to be successful in personal selling and insights about recent trends in sales management.2. To provide an understanding of the tools and techniques necessary to effectively manage the sales function - organization - sales individual.3. To provide students with advanced skills in the areas of

Sr. No.	Programme	Objectives	Programme Specific Objectives
			<p>interpersonal communications, Motivational techniques.</p> <p>Finance Spl – II [Long term Finance]:</p> <ol style="list-style-type: none"> 1. To make the study of long-term financing 2. To make the student well-acquainted regarding current financial structure <p>Marketing Spl – II [Retail Management] :</p> <ol style="list-style-type: none"> 1. To provide insights into all functional areas of retailing. 2. To give a perspective of the Indian retail scenario. 3. To identify the paradigm shifts in retailing business with increasing scope of Technology and e-business.
2.	Master of Commerce (M.Com) Specialisation : - Business Administration)	<p>PO1.Critical Thinking: Take informed actions after (identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.</p> <p>PO2. Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.</p>	<p><u>M.COM PART I (Sem – I)</u></p> <p>Management Accounting The objective of the course is to enable students to acquire sound Knowledge of concepts, methods and techniques of management accounting and to make the students develop competence with their usage in managerial decision making and control.</p> <p>Strategic Management To understand the approaches to Strategic Decision Making, Strategic Management Process.</p> <p>Production and Operation management: 1. To provide goods and services at the right time, at the right place at the right manufacturing cost of the right</p>

Sr. No.	Programme	Objectives	Programme Specific Objectives
		<p>PO3.Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.</p> <p>PO4.Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.</p> <p>PO5.Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.</p> <p>PO6.Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.</p> <p>PO7.Self-directed and Life-long Learning: Acquire the ability to engage in independent and life- long learning in the broadest context socio-technological changes</p>	<p>quality.</p> <p>2. To understand manufacturing technology and its role in developing business strategy.</p> <p>3. To identify the role of operation function.</p> <p>4. To understand the external and internal effects of five operation performance</p> <p>Objectives</p> <p>Financial Management :</p> <p>1. To impart basic knowledge of Financial Management.</p> <p>2. To know the implications of various financial ratios in decision making.</p> <p>3. To study the significance of working capital in business.</p> <p><u>M.COM PART I (Sem – II)</u></p> <p>Financial Analysis & Control: The objective of the course is to enable students to acquire sound knowledge of concepts, methods and techniques of management accounting and to make the students develop competence with their usage in managerial decision making and control.</p> <p>Industrial Economics:</p> <p>1) To study the basic concepts of Industrial Economics.</p> <p>2) To study the significance and problems of Industrialization.</p> <p>3) To study the impact of Industrialization on Indian Economy.</p> <p>Business Ethics and Professional Values:</p> <p>1.To understand ethics in business</p>

Sr. No.	Programme	Objectives	Programme Specific Objectives
			<p>and in profession.</p> <p>2. To understand Indian ethical practices.</p> <p>Elements Of Knowledge</p> <p>Management:</p> <p>1.To Understand knowledge and wisdom in everyday dewelling.</p> <p>2.To understand organisational learning.</p> <p><u>M.COM PART II (Sem – III)</u></p> <p>Business Finance :</p> <p>To enable students to acquire sound knowledge of concepts, nature and structure of business finance.</p> <p>Research Methodology for Business:</p> <p>1. To acquaint the students with the areas of Business Research Activities.</p> <p>2. To enhance capabilities of students to conduct the research in the field of business and social sciences. 3. To enable students, in developing the most appropriate methodology for their research studies.4. To make them familiar with the art of using different research methods and techniques.</p> <p>Human Resource Management:</p> <p>To Understand the nature of HRM and the study of linkage between labor and management.</p> <p>Organizational Behavior:</p> <p>To understand the human behavior in organisational culture.</p> <p><u>M.COM PART II (Sem – IV)</u></p> <p>Capital Market and Financial</p>

			<p>Services.</p> <p>To enable students to acquire sound knowledge, concept and structure of capital market and financial services.</p>
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Sr. No.	Programme	Objectives	Programme Specific Objectives
			<p>Industrial Economic Environment.</p> <ol style="list-style-type: none"> 1. To study the basic concepts of Industrial Finance. 2. To study the effects of New Economic Policy. 3. To study the impact of Labor reforms on Industries. <p>Recent Advances in Business Administration:</p> <p>Project Work / Case Studies:</p>

3. Courses offered

Sr. No.	Course	Course Outcomes
1.	FYBBA	
	Principles of Management	<ol style="list-style-type: none"> 1. Developed the ability of managerial thinking and cultivate business acumen. 2. Established an ability to organise various managerial programmes and events. 3. Acquainted the knowledge about new systems and trends in modern management.
	Business communication skills	<ol style="list-style-type: none"> 1. Enhanced various skills such as linguistic, non linguistic and Paralinguistic skills. 2. Acquainted an integrative approach where reading, writing, oral and speaking components are used together to enhance the students' ability to communicate and write effectively. 3. Developed awareness among student about Methods and Media of communication.
	Business Accounting	<ol style="list-style-type: none"> 1. Up – to – date the students to acquire sound knowledge of basic concepts of accounting 2. Learned basic accounting knowledge

Sr. No.	Course	Course Outcomes
		3. Sophisticated the knowledge about recording of transactions and preparation of final accounts 4. Enlightened the students about accounting software packages
	Business Economics (MICRO)	1. The students are familiarized to basic micro economic concepts. 2. Applies economic analysis in the formulation of business policies. 3. Sharper economic reasoning to solve problems of business.
	Business Mathematics	1. Solved applications of matrices in business. 2. Understood the concept and application of Permutations & Combinations in business. 3. Solved L.P.P. and its applications in business. 4. Prepared the concept of Transportation problems & its applications in business World. 5. Expert the concept of shares & share market.
	Business Demography	1. Developed knowledge base for demographic and environmental factors affecting business. 2. Awake the students aware of environmental problems related to business and Commerce. 3. Inculcated values of Environmental ethics amongst the students.
	Skill Enhancement Course (Add on Courses).	1. To understand the role of communication for managers. 2. To develop their managerial skills. 3. To make them understand different types of communication used in an organisation.
2.	SYBBA	
	Personality Development	1. Talented students are aware about the dimensions and importance of effective personality. 2. Skilled personality traits and formation and vital contribution in the world of business . 3. Acquainted the students aware about the various dynamics of personality development.
	Business Ethics	1. Imparted knowledge of Business Ethics to the students. 2. Promoted Ethical Practices in the Business. 3. Enhanced Ethical and Value Based thought process among the future manager's entrepreneurs

Human Resource Management and Organisational	1. Introduced to the students the functional department of Human resource management and acquaint them with planning, its different functions in an organization.
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Sr. No.	Course	Course Outcomes
	Behavior	2. Exposed the human resource processes that are concerned with planning, motivating and developing suitable employees for the benefit of the organization.
	Management Accounting	1. Imparted basic knowledge of Management Accounting. 2. Knowledgeable the implications of various financial ratios in decision making. 3. Analyzed the significance of working capital in business. 4. Understood the concept of budgetary control and its application in business. 5. Aware of the calculating ability of various techniques of management accounting.
	Business Economics (MACRO)	1. Aesthetic behavior of working of the economy as a whole. 2. Sophisticated an analytical framework to understand the inter-linkages among the crucial macroeconomic variables. 3. Applied economic reasoning to problems of business and public policy.
	IT in Management	1. Wise role of IT in Management. 2. Brilliant the basics of operating systems. 3. Well Informed to know the current happenings
3.	TYBBA	
	Supply Chain and Logistics Management	1. Introduced the fundamental concepts in Materials and Logistics Management. 2. Familiarized with the issues in core functions in materials and logistics management
	Entrepreneurship Development	1. Innovated entrepreneurial awareness among the students. 2. Enhanced students to up bring out their own business plan. 3. Well – Versed knowledge and understanding in creating and managing new venture.
	Business Law	1. Well – taught basic legal terms and concepts used in law pertaining to business 2. Comprehend applicability of legal principles to situations in Business world by referring to few decided leading cases.
	Research Methodology	1. Cultivated the students with basic understanding of research process and tools for the same. 2. Erudite an understanding of the tools and techniques necessary for research and report writing.

Sr. No.	Course	Course Outcomes
	Finance Spl – I [Analysis of Financial Statement]	1. Briefed course is designed to prepare students for interpretation and analysis of financial statements effectively. 2. Smart student well acquainted with current financial practices 3. Wisely designed primarily for students who expect to be intensive users of financial statements as part of their professional responsibilities.
	Marketing Spl – I [Sales Management]	1. Cultivated the students with basic understanding of the processes and skills necessary to be successful in personal selling and insights about recent trends in sales management. 2. Cosmopolitan understanding of the tools and techniques necessary to effectively manage the sales function - organization - sales individual. 3. Cultured students with advanced skills in the areas of interpersonal communications, Motivational techniques.
	Finance Spl – II [Long term Finance]	1. Familiar the study of long-term financing 2. Trained the student well-acquainted regarding current financial structure
	Marketing Spl – II [Retail Management]	1. Perspective insights into all functional areas of retailing. 2. Perspective of the Indian retail scenario. 3. Identified the paradigm shifts in retailing business with increasing scope of technology and e-business.
4.	M.Com -I (Business Administration)	
	Management Accounting	The prudent of the course is to enable students to acquire sound Knowledge of concepts, methods and techniques of management accounting and to make the students develop competence with their usage in managerial decision making and control.
	Strategic Management	Well – Informed the approaches to Strategic Decision Making, Strategic Management Process.

Sr. No.	Course	Course Outcomes
	Production and Operation management	1. Informed goods and services at the right time, at the right place at the right manufacturing cost of the right quality. 2. Tactful manufacturing technology and its role in developing business strategy. 3. Identified the role of operation function. 4. Aware of the external and internal effects of five operation performance Objectives
	Financial Management	1 Imparted basic knowledge of Financial Management. 2. Knowledgeable the implications of various financial ratios in decision making. 3. Exposed the significance of working capital in business.
	Financial Analysis & Control	Acquainted course is to enable students to acquire sound knowledge of concepts, methods and techniques of management accounting and to make the students develop competence with their usage in managerial decision making and control.
	Industrial Economics	1) Developed the basic concepts of Industrial Economics. 2) Instilled the significance and problems of Industrialization. 3) Enlightened the impact of Industrialization on Indian Economy. Application of Cost Accounting: 1. Fully reflective knowledge on advanced cost accounting practices.
	Business Ethics and Professional Values	1. Develop the ethics in business and in profession. 2. To understood Indian ethical practices
	Elements Of Knowledge Management	1. Sharp knowledge and wisdom in everyday dwelling. 2.Expert organizational learning
5.	M.Com -II (Business Administration)	

Sr. No.	Course	Course Outcomes
	Business Finance	Talented students to acquire sound knowledge of concepts, nature and structure of business finance.
	Research Methodology for Business	1. Acquainted the students with the areas of Business Research Activities. 2. Enhanced capabilities of students to conduct the research in the field of business and social sciences. 3. Awake students, in developing the most appropriate methodology for their research studies. 4. To make them familiar with the art of using different research methods and techniques.
	Human Resource Management	To versatile the nature of HRM and the study of linkage between labor and management.
	Organizational Behavior	To prepared the human behavior in organizational culture.
	Capital Market and Financial Services	Inculcated students to acquire sound knowledge, concept and structure of capital market and financial services.
	Industrial Economic Environment	1. Solved the basic concepts of Industrial Finance. 2. Expert the effects of New Economic Policy. 3. Skilled Labor reforms on Industries
	Recent Advances in Business Administration Project Work / Case Studies:	The students will have to select a subject from any area of the syllabus of Business Administration and get practical exposure by undertaking project work.

Sr. No.	Program	Program Objectives	Program Specific Outcomes
1	B. Sc. Biotechnology	<ol style="list-style-type: none"> 1. To introduce the concepts in various allied subjects 2. To enrich students' knowledge 3. To help the students to build interdisciplinary approach 4. To inculcate sense of scientific responsibilities and social and environment awareness 5. To help students build-up a progressive and successful career 	<ol style="list-style-type: none"> 1. The interdisciplinary nature of biotechnology helps student to understand living systems including animal, plant, microbes and their studies from molecular biology to cell biology, from biochemistry to biophysics, from genetic engineering to stem cell research, from bioinformatics to genomics-proteomics, from environmental biology to biodiversity, from microbiology to bioprocess engineering, from bioremediation to material transformation and so on. 2. Application of these studies on living organisms and their bioprocesses are learnt by students. 3. Economic and social renaissance is staged on biotechnology especially, since it's biomedical and cutting edge technological applications are tremendously powerful in shaping student with exciting future. 4. Biotechnologists are always in demand as an efficient work force in fundamental research and industries.

Sr. No.	Course	Course outcomes
F. Y. B. Sc. Biotechnology		
1	Fundamentals of Chemistry	<ol style="list-style-type: none"> 1. The student will acquire a foundation of chemistry of sufficient breadth and depth to enable them 2. Student will learn the laboratory skills needed to design, safely conduct and interpret chemical research.
2	Fundamentals of Physics	<ol style="list-style-type: none"> 1. Students will use mathematics and computation to describe and manipulate fundamental physical constructs and to solve problems. 2. Demonstrate a growing conceptual understanding of the basic fields of physics. 3. Use basic experimental apparatus common to the study of physical phenomena.
3	Biochemistry	<ol style="list-style-type: none"> 1. The course aims to provide an advanced understanding of the core principles and topics of Biochemistry. 2. To enable students to acquire a specialized knowledge and understanding of selected aspects by means of a stem/branch lecture series and a research project.
4	Biophysics	<ol style="list-style-type: none"> 1. Biophysics should be apply the principles of physical sciences to understand and solve biological complexities. 2. Using the knowledge gained during the course, students should be able to address the academic and industrial research problems
5	Microbiology	<ol style="list-style-type: none"> 1. The student will be able to evaluate methods used to identify infectious agents in the clinical microbiology lab. 2. Microbiology is to provide an understanding of the natural history of infectious diseases in order to deal with the etiology, pathogenesis, laboratory diagnosis, treatment and control of infections in the community.
6	Animal science	<ol style="list-style-type: none"> 1. Students will able to apply concepts of breeding, physiology, nutrition, herd-health, economics and management into practical and profitable animal production programs. 2. Students will be able develop feeding systems for farm animal production and companion animals.
7	Plant science	<ol style="list-style-type: none"> 1. Be able to formulate original questions about plants into empirically testable hypotheses. 2. They will be able to collect and analyze data obtained from original research, and translate and apply experimental data to advance the field and solve real-world problems. 3. Student will synthesize and apply knowledge to better understand and manage plant-based systems.
8	Biomathematics & Biostatistics	<ol style="list-style-type: none"> 1. Be able to communicate mathematical and logical ideas in writing. 2. Be able to apply problem solving and logical skills. 3. Have a deeper understanding of mathematical theory. 4. Have a solid knowledge of elementary statistics. 5. They will able to choose and apply appropriate statistical methods for analyzing one or two variables. 6. They use technology to perform descriptive and inferential data analysis for one or two variables.

9	Practicals in Chemistry & Biochemistry	<ol style="list-style-type: none"> 1. Increase students practical or laboratory experience or exposure. 2. Enhance student's practical laboratory skills and equipment or instrument use. 3. They will understand the methodology of a scientific experiments. 4. To establish an understanding of the quantitative aspects of biochemical analyses. 5. To develop basic practical biochemical skills for the handling and analysis of biomolecules.
10	Practicals in Physics & Biophysics	<ol style="list-style-type: none"> 1. To gain practical knowledge by applying the experimental methods to correlate with the Physics theory. 2. To learn the usage of electrical and optical systems for various measurements.
11	Practical in Microbiology & Bioinstrumentation	<ol style="list-style-type: none"> 3. Explain the theoretical basis of the tools, technologies and methods common to microbiology. 4. Demonstrate practical skills in the use of tools, technologies and methods common to microbiology. 5. Apply the scientific method and hypothesis testing in the design and execution of experiments.
12	Practicals in Computer & Biostatistics	<ol style="list-style-type: none"> 1. The Information Technology prepares a student for basic knowledge using computer to solve data processing problems in life. 2. Demonstrate a knowledge and understanding of using computers to solve problems related to practical applications. 3. Choose and apply appropriate statistical methods for analyzing one or two variables. 4. Interpret statistical results correctly, effectively, and in context.
S.Y. B. Sc. Biotechnology		
1	Genetics & immunology	<ol style="list-style-type: none"> 1. Students will learn the basic principles of inheritance at the molecular, cellular and organismal levels and gene expressions. 2. Understand and appreciate the diversity of life as it evolved over time by processes of mutation, selection and genetic change. 3. They learn about chromosomal aberrations and structure of chromosomes. 4. This course gives an overview on the immune system including organs, cells and receptors. 5. The students learns about molecular basis of antigen recognition, hypersensitivity reaction, antigen-antibody reactions. 6. The course develops in the student an appreciation for principles of immunology and its applications
2	Cell biology	<ol style="list-style-type: none"> 1. To understand the structures and purposes of basic components of eukaryotic cells, especially macromolecules, membranes, and organelles 2. To understand structure and function of various cell organelle. 3. To understand the cellular components underlying mitotic and mitosis cell division. 4. Demonstration of cell wall and cell membrane with respect to their function. 5. Relate how cell movement and cell-cell communication occur and discuss mechanisms of signal transduction. 6. Outlines the processes that controls eukaryotic cell cycle, apoptosis including better understanding of cancer.

3	Environmental biotechnology	<ol style="list-style-type: none"> 1. The main objective of this paper is to create an awareness among the students about the environment. 2. They will learn about ecological organization. The students learn about rock types, basic concepts of community, pollution and biodiversity 3. The objective of this course is to introduce the students to the role of biotechnology in waste water management. 4. The students learn about role of microbes in biodegradation, bioremediation and composting. 5. The students learn about modern conservation practices, Red data book. 6. At the end of the course, students are able to analyze case studies representatives of key areas of environmental biotechnology
4	Practicals in Environmental biotechnology	Whatever the students learned in their theory courses such as ecosystem, community , pollution and it's effects, EIA case study etc. these concept get verified with help of this course.
5	Practicals in cell biology & genetics	This course will help better understanding of theoretical concept like cell organelles, staining techniques, blood cell types, and mitosis and meiosis slide preparation. Students will learn genetics problems, Mendelian inheritance and gene interaction.
6	Molecular biology	<ol style="list-style-type: none"> 1. To understand the structure of DNA through Watson & Crick model 2. The course teaches the students about genes at molecular level 3. They learn about DNA, RNA and their replication, mutations, DNA repair mechanism. 4. It mainly describe central dogma of biology in eukaryotic and prokaryotes.
7	Plant and animal development	<ol style="list-style-type: none"> 1. Course contains vegetative and reproductive development of plant. 2. It also includes model systems like Fucus, and Arabidopsis 3. It includes gametogenesis, pattern of cleavage, 4. Program includes concept of dedifferentiation, redifferentiation, determination, and competence. 5. Students will learn about male and female gamete development
8	Metabolic pathways	<ol style="list-style-type: none"> 1. In this course student learn in detail about enzymes with kinetics. 2. Course contains overview of carbohydrate, lipid and protein metabolism. 3. Students will understand electron transport chain and photosynthesis in detail. 4. It also includes bioenergetics and oxidation-reduction reactions.
9	Scientific writing and communications	<ol style="list-style-type: none"> 1. These courses are designed to develop the communication and vocabulary skills in the students. 2. Students excels in oral and written presentations skills 3. This course encourage students for their grammar skills. 4. This course also includes literature citations, preparing and submitting the manuscript. 5. It includes Introduction: Defining the problem; Literature survey; Justification of study
10	Practicals in molecular biology	<ol style="list-style-type: none"> 1. This course increase the understanding of central dogma through DNA isolation and purification techniques. 2. Along with this they will also learn protein estimation and separation methods.

11	Practicals in Developmental biology	<ol style="list-style-type: none"> 1. After completion of this course, students will be able to understand methods of plant development and SAM, RAM through a) Dissection b) Sectioning c) Maceration d) Staining) Mounting. 2. In Animal development, they understand different eggs, stages of egg development, effect of teratogen, life cycle of frog.
T. Y. B. Sc. Biotechnology		
1	Microbial Biotechnology	<p>After completion of this course: The students</p> <ol style="list-style-type: none"> 1. Be able to recognize a familiarity with the wide diversity of microbes, and their potential for use in various fields of human life. 2. Be able to demonstrate a knowledge of microbial growth and growth kinetics and their classification based on environment 3. Be able to demonstrate familiarity with methods of immobilization techniques and their wide applications by using microbes and their enzymes 4. Be able to understand role of beneficial bacteria to human health as normal flora and harmful microbes as pathogens. 5. Be able to demonstrate an understanding of various infections their cause, transmission ,diagnosis, preventive measures and treatment
2	Plant & animal tissue culture	<p>After completion of this course:</p> <ol style="list-style-type: none"> 1. The students acquaint with principles, technical requirement, scientific and commercial applications in Plant tissue culture. 2. support methodologies in plant tissue/cell culture to plant improvement, 3. Become motivated to set goals towards pursuing graduate school and higher level positions, such as lab technician and key scientist in plant biotechnological research institutes and industries. 4. Be able to describe structure of animal genes and genomes and how genes are expressed and what regulatory mechanisms contribute to control of gene expression. 5. Be able to describe basic principles and techniques in genetic manipulation and genetic engineering.
3	Biodiversity	<p>After completion of this course: The students able to</p> <ol style="list-style-type: none"> 1. Evaluate the role of micro-organisms in specific biotechnological processes. 2. To understand growth phase of microorganisms and effect of environment on growth. 3. Understand milk grading process and milk testing techniques. 4. Demonstrate a clear understanding of how biochemical pathways relate to biotechnological applications. It involves understanding water testing methods for biological pollution and determination of water potability. 5. Discover that life can be found almost everywhere on earth and explore the complexity of biodiversity 6. Examine the variety of life within the five kingdoms 7. Realize that people are dependent on intact habitats that sustain the various organisms we need to produce food, medicines, clothing, and other materials 8. Learn about certain species' roles in an ecosystem

4	Practicals in Microbial biotech & field studies	<p>The course introduces the practice and process of culturing animal cells and cell lines in a laboratory. After completion of course the students</p> <ol style="list-style-type: none"> 1. Become familiar with equipments used in animal and plant tissue culture. 2. Become familiar with aseptic techniques, media preparation 3. Understand the safety procedures need for tissue culture.
5	Practicals in Tissue culture	<p>The course introduces the practice and process of culturing animal cells and cell lines in a laboratory.</p> <ol style="list-style-type: none"> 1. After completion of course: The students 2. Become familiar with equipment used in animal and plant tissue culture. 3. Become familiar with aseptic techniques, media preparation 4. Understand the safety procedures need for tissue culture.
6	Large scale manufacturing process	<p>The students will be able to:</p> <ol style="list-style-type: none"> 1. Evaluate factors that contribute in enhancement of cell and product formation during fermentation process. 2. Analyze kinetics of cell and product formation in batch, continuous and fed-batch cultures 3. Differentiate the rheological changes during fermentation process 4. Helps in the student's exposure on industrial applications of bioprocesses.
7	Biochemical and Biophysical techniques	<p>This course aims to develop the key transferable skills required in scientific work.</p> <ol style="list-style-type: none"> 1. To develop practical research skills 2. To build analytical and presentation skills 3. To be aware about advanced scientific methods 4. This significantly enhances the employability of the candidates in Biotechnological, Pharmaceutical Industries and Analytical Laboratories and research institutes
8	Practicals in Recombinant DNA technology	<ol style="list-style-type: none"> 1. To familiarize the student with emerging field of biotechnology i.e. Recombinant DNA Technology as well as to create understanding and expertise in wet lab techniques in genetic engineering. 2. After completion of this course, student will be able to 3. Explain sufficient scientific understanding of the subject 4. Have good knowledge of application of Recombinant DNA techniques in Life Sciences research that include transgenic technology, gene therapy, forensics and parental disputes. Use of molecular markers and their applications.
9	Practicals in LSMP & BBT	<p>After completion of this course, student will be able to</p> <ol style="list-style-type: none"> 1. To understand design of bioreactors and control necessary for maximizing production. 2. Select and optimize media for maximum production of microbial metabolites 3. Designing of protocols for strain improvement and separation of molecules after fermentation process. 4. To acquaint students with technical and biological aspect of microbial utilization for production of metabolites.

10	Techniques in Recombinant DNA technology	<ol style="list-style-type: none"> 1. This course teaches RDNA technology techniques and their application in the field of genetic engineering 2. After completion of this course, student will be able to 3. They learn about plasmids, vectors and gain knowledge on the construction of cDNA libraries 4. knowledge on gene manipulation, gene expression, etc. which prepares them for further studies in the area of genetic engineering
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Courses offered at Post-graduate Level
(M. Sc. Biotechnology)

Sr. No.	Program	Program Objectives	Program Specific Outcomes
1	M. Sc. Biotechnology	<ul style="list-style-type: none"> • To help the students to build interdisciplinary approach • To empower students to excel in various research fields of Life Sciences • To inculcate sense of scientific responsibilities and social and environment awareness • To understand role of biotechnology various fields for betterment of life • To help student build-up a progressive and successful career 	<ul style="list-style-type: none"> • To understand structure-functional relation of protein, genome & drugs using bioinformatics tools. • To study plant transformation using genetic engineering for developing better varieties of economically & medicinally important. • Understanding the mechanism of cloning of micro-organisms, plants & animal cells through genetic engineering & tissue culture tools • To develop awareness about patenting & intellectual property rights in the field of life science. • To understand breeding mechanism in plants & livestock. • To study ultrastructure, classification & cultivation of viruses • To aware students about emerging & re-emerging viruses diseases • To know about stem cells & its applications in medical field • To study differential expression of genes in normal & diseased individuals

Sr. No.	Course	Course outcomes
M.Sc. Biotechnology Part-I		
	Advanced Biochemistry	<ol style="list-style-type: none"> 1. Ability to understand details of biomolecules , their role in body building and interaction for carrying out metabolism. 2. Knowledge of gene expression and regulation at different levels of cell cycle. 3. Students would be able to explain structural and functional relationships of all the biomolecules. 4. Analysis of biomolecules and comparison from different sources. 5. Acquire thorough knowledge of different biochemical techniques that are used for analysis in R&D and in industries.
	Cell and Molecular biology	<p>After studying this course students will be able to</p> <ol style="list-style-type: none"> 1. Build knowledge of Cell structure and function in detail. 2. The difference in molecular processes in eukaryotes and prokaryotes 3. Understanding the role of genes and molecules in signaling and metabolism of cells 4. Acquire knowledge of genes and their role in cancer. 5. Different processes involved in central dogma
	Genetics & Immunology	<p>Upon completion of the course, students will have the knowledge and skills to</p> <ol style="list-style-type: none"> 1. Understand the concepts of population and quantitative genetics. 2. Knowledge regarding mutation: Causes, agents that are responsible and role in cancer and cell death. 3. Thorough knowledge of immunity and the factors responsible for developing immunity and preventing infection 4. Development of diseases and its prevention 5. Different techniques involved in causing mutation and analyzing antigen and antibody in testing.
	Laboratory course- I	<p>Laboratory course includes detailed knowledge of techniques used in molecular biology, genetics and immunology</p> <ol style="list-style-type: none"> 1. Students would separate biomolecules and describe their characteristics 2. Extract genomic DNA/ RNA/ proteins and analyze it, fractionate the biomolecules 3. Test different samples for infection against any pathogen
	Environmental Biotechnology	Students after learning this course
	Genetic engineering	

	Bacteriology- Virology	
	Plant Biotechnology	
	Laboratory Course- II	
	Medical biotechnology	
M.Sc. Biotechnology Part-II		
	Animal and Stem Cell Technology	<ol style="list-style-type: none"> 1. Course contains introduction of Tissue/Cell Culture and techniques which includes various systems of tissue cultures. 2. it also include Establishing primary cell culture, Organ culture and cell lines with their Methodology. 3. program contains Stem cells technology and its applications 4. Transgenic animal and their strategies gives broad ideas to students for experimental studies. 5. program also includes Study of animal husbandry and their application
	Bioprocess engineering	<ol style="list-style-type: none"> 1. This unit contains interdisciplinary challenge, Biotechnology & Bioprocess Engineering, Definition of Bioprocess and bioprocess engineering, over view of bioprocesses with their various components. Aseptic operations and Containment 2. Students learn types of Fermentations, Design of Fermenter/ bioreactors, Kinetics of operation of bioreactors, Isolation, screening, Strain Improvement and maintenance of industrially important microbes. 3. Student also learns scale up and scale down fermentation processes in industrial level.

	Bioinformatics and Biostatistics	<ol style="list-style-type: none"> 1. Course objective is to learn Major Bioinformatics Resources and Biological databases and Basic Concepts in Biological sequence Analysis 2. Student also learn Structural Bioinformatics, Pharmacophore modelling and Chemoinformatics and Molecular Modeling. 3. Student also learn Biostatistic in this course which includes Sampling, distribution and presentation, Hypothesis Testing (with biological examples) and Design, correlation and regression analysis. 4. Student also learns to use several Statistical Methods such as Analysis of variance table (ANOVA), Post hoc Tests, Tukey's test for pairwise comparison of treatments , Dunnet's test for comparison of treatment means with control, Duncan's multiple range test, Mann–Whitney U test
	Agricultural Biotechnology	Subject includes Introduction to agricultural Biotechnology where they study Crop improvement methodology and recent advances to produce transgenic plants.
	Genomics and Proteomics	<ol style="list-style-type: none"> 1. Students learns about Genomics, Transcriptomics, Microarray and application of genomics 2. In proteomics section students aware about Introduction & concept of proteomics, Protein structure-function relationship, Techniques in Proteomics and application of proteomics in biological systems.
	Advanced Bio-analytical Techniques	<ol style="list-style-type: none"> 1. This subject is important in terms of learning various Bio-analytical Techniques such as Microscopic Techniques, Histochemical and Immunotechniques , Advanced Application of Spectroscopy, Advanced Chromatography and Electrophoretic technique 2. Students also learns Advanced Bio-analytical Techniques and Automated Systems in biological systems.
	Research Projects	<ol style="list-style-type: none"> 1. Students have research project during their last semester where they perform Project work, thesis Submission & presentation. 2. Students also do their project in industry or research institute where they receive very good knowledge about industrial research.
	Research Methodology & Scientific Communication	<ol style="list-style-type: none"> 1. This is one of the choice based subject and students learn Research Methods and Scientific Methodology. 2. Students also get knowledge of Data Collection and analysis, Research data organization, Research in Practice, Research Ethics and Scientific Communication

Chemistry

Department of Chemistry

Sr. No.	Program	Program Objectives	Program Specific Outcomes
1	FY BSc. Chemistry	<p>To provide in-depth knowledge of scientific and technological aspects of Chemistry</p> <ul style="list-style-type: none"> · To familiarize with current and recent scientific and technological developments · To enrich knowledge through problem-solving, hand-on activities, study visits, projects, etc. · To train students in skills related to research, education, industry, and market. · To create the foundation for research and development in Chemistry · To develop analytical abilities towards real-world problems · To help students build-up a progressive and successful career in Chemistry 	<ol style="list-style-type: none"> 1. After completion of the program, students will be able to have in-depth knowledge of basic concepts in Chemistry 2. Students will be able to apply the laws of Chemistry in real-life situations to solve the problems. 3. Students develop the aptitude of researching by undertaking small projects. 4. The student will have set his foundation to pursue higher education in Chemistry. 5. After completing the program student will have developed an interdisciplinary approach and can pursue higher studies in subjects other than Chemistry
2.	MSc. Chemistry (I)	<ol style="list-style-type: none"> 1. to develop a strong footing in the fundamentals and specialize in the disciplines of his/her liking and abilities. 2. to develop an in-depth understanding of various aspects of the subject. 3. The principles in Physics will be studied in depth. 4. To have a deeper understanding of the laws of nature through subjects like material science, Nanotechnology, quantum mechanics, Bio-organic Chemistry, etc. 5. The ability of problem-solving will be enhanced. Students can apply principles in chemistry to real-life problems. 	<ol style="list-style-type: none"> 1. The student will have an in-depth knowledge of the subject. 2. Students will have acquired the necessary communication skills to teach Chemistry in Colleges. 3. Students will have acquired the necessary skills for working in research institutes. 4. Students will have acquired the necessary skills and expertise to work in an industry related to materials processing and quality control

Courses offered – Undergraduate Chemistry

Sr.No	Class	Course	Course Outcomes
1	F.Y.B.Sc. Chemistry (Semester Pattern)	Paper I Physical & Inorganic Chemistry (CH 101)	<p>This course enables students to understand and apply thermodynamic principles to physical and chemical process 2. Calculations of enthalpy, Bond energy, Bond dissociation energy, resonance energy 3. Variation of enthalpy with temperature–Kirchoff's equation 4. Third law of thermodynamic and its applications.</p> <p>Students are made aware about Chemical equilibrium will make students to understand 1. The relation between Free energy and equilibrium and factors affecting on equilibrium constant. 2. Exergonic and endergonic reaction 3. Gas equilibrium, equilibrium constant, and molecular interpretation of equilibrium constant 4. Van't Haff equation and its application.</p> <p>The ionic equilibria chapter will lead students to understand 1. The concept of the ionization process occurred in acids, bases, and pH scale 2. Related concepts such as Common ion effect hydrolysis constant, ionic product, solubility product 3. Degree of hydrolysis and pH for different salts, buffer solutions</p>
		Paper-II Organic & Inorganic Chemistry (CH 102)	Students are made aware of fundamental concepts of organic chemistry that govern the structure, bonding, properties, structural effects, acid-base theories, preparation methods, reactivity, functional groups, and stereochemistry of organic molecules. Further, students are expected to understand the fundamentals, principles, and recent developments in the subject area. 2. It is expected to inspire and boost the interest of the students towards chemistry as the main subject. 3. To familiarize me with current and recent developments in Chemistry. 4. To create a foundation for research and development in Chemistry.
		Paper III Practical chemistry (CH 103)	Importance of chemical safety and Lab safety while performing experiments in laboratory 2. Determination of thermochemical parameters and related concepts 3. Techniques of pH measurements 4. Preparation of buffer solutions 5. Elemental analysis of organic compounds (non-instrumental) 6. Chromatographic Techniques for separation of constituents of mixtures
2		Inorganic Chemistry CH 201	1. Atomic Structure 1. Various theories and principles applied to reveal atomic structure 2. Origin of quantum mechanics and its need to understand the structure of hydrogen atom 3. Schrodinger equation for hydrogen atom 4. The radial and angular part of the hydrogenic wave function 5. Significance of quantum numbers 6. Shapes of orbitals 2. Periodicity of

			<p>Elements</p> <ol style="list-style-type: none"> 1. Explain rules for filling electrons in various orbitals- Aufbau's principle, Pauli exclusion principle, Hund's rule of maximum multiplicity 2. Discuss the electronic configuration of an atom and anomalous electronic configurations. 3. Describe the stability of half-filled and completely filled orbitals. 4. Discuss the concept of exchange energy and relative energies of atomic orbitals 5. Design Skeleton of the long form of the periodic table. 6. Describe Block, group, modern periodic law, and periodicity. 7. Classification of elements as the main group, transition and inner transition elements 8. Write the name, symbol, electronic configuration, trends and properties. 9. Explain periodicity in the following properties in detail: <ol style="list-style-type: none"> a. Effective nuclear charge, shielding or screening effect; some numerical problems. b. Atomic and ionic size. c. Crystal and covalent radii d. Ionization energies e. Electronegativity- definition, trend, Pauling electronegativity scale. f. The oxidation state of elements <p>Chemical Bonding</p> <ol style="list-style-type: none"> 1. Attainment of stable electronic configurations. 2. Define various types of chemical bonds- Ionic, covalent, coordinate, and metallic bond 3. Explain characteristics of an ionic bond, types of ions, energy consideration in ionic bonding, lattice and solvation energy and their importance in the context of stability and solubility of ionic compounds 4. Summarize the Born-Landé equation and Born-Haber cycle, 5. Define Fajan's rule, bond moment, dipole moment and percent ionic character. Describe the VB approach, Hybridization with an example of the linear, trigonal, square planar, tetrahedral, TBP, and octahedral. 7. Discuss assumptions and needs of the VSEPR theory. 8. Interpret the concept of different types of valence shell electron pairs and their contribution in bonding. 9. Application of non-bonded lone pairs in the shape of molecule 10. Basic understanding of geometry and effect of lone pairs with examples such as ClF_3, Cl_2O, BrF_5, XeO_3, and XeOF_4.
		Analytical Chemistry CH202	<ol style="list-style-type: none"> 1. Introduction to Analytical Chemistry <ol style="list-style-type: none"> i. Analytical Chemistry –a branch of chemistry ii. Perspectives of analytical Chemistry iii. analytical problems 2. Calculations used in Analytical Chemistry <ol style="list-style-type: none"> i. Calculations of mole, molar concentrations and various units of concentrations which will be helpful for the preparation of solution ii. The relation between molecular formula and empirical formula iii. Stoichiometric calculation iv. Define term mole, millimole, molar concentration, molar equilibrium concentration and Percent Concentration. v. SI units, the distinction between mass and weight vi. Units such as parts per million, parts per billion, parts per thousand, solution-dilutant volume ratio, function density and a specific gravity of solutions. 3 Qualitative Analysis of Organic Compounds Basics of type determination, characteristic tests, and classifications, reactions of different functional groups. <ol style="list-style-type: none"> i. Separation of binary mixtures and analysis ii. Elemental analysis -Detection of

			nitrogen, sulfur, halogen and phosphorous by Lassaigne's test. iii. Purification techniques for organic compounds. 4. Chromatographic Techniques – Paper and Thin layer Chromatography i. Basics of chromatography and types of chromatography ii. Theoretical background for Paper and Thin Layer Chromatography 5. pH meter i. pH meter and electrodes for pH measurement ii. Measurement of pH iii. Working on pH meter iv. Applications of pH meter
	Semester II	Practical course CH 203	Inorganic Estimations using volumetric analysis 2. Synthesis of Inorganic compounds 3. Analysis of commercial products 4. Purification of organic compounds 5. Preparations and mechanism of reactions involved

Courses offered –Postgraduate Chemistry

Sr.No	Class	Course	Course Outcomes
1	M.Sc I Semester- I Organic & Drug Chemistry	CH-110 Fundamentals of Physical Chemistry I	The course aims to provide a fundamental understanding of physical chemistry, students learn the concept of Gibbs and Helmholtz energies, Chemical potential, Expressing Chemical equilibrium in terms of chemical potential. Elements of quantum chemistry, wave-particle duality, uncertainty principle, wave function and its interpretation, well-behaved functions, orthonormal functions, Schrodinger equation, particle in a box, degeneracy, quantum mechanical harmonic oscillator, and quantum tunneling are introduced. Students are made aware of Chemical kinetics and reaction dynamics topics such as Reversible reactions, the principle of microscopic reversibility, steady-state approximation, elucidating mechanism using SSA. Arrhenius theory, enzyme catalysis, and Michaelis-Menten mechanism.
		CH -130 Molecular Symmetry & Chemistry of s & p block elements	Students are made to understand the symmetry and group theory and use this knowledge to interpret the properties like dipole moment, optical activity, and signals in IR and Raman spectroscopy for structure identification. Students are also made to understand the periodic trends in properties of S and P block elements and their applications in fields like catalysis, industry, human metabolism, and medicines, etc.
		CH-150 Organic Chemistry	To understand some fundamental aspects of organic chemistry, to learn the concept aromaticity, to understand the various types of aromaticity 2. To study heterocyclic compounds containing one and two hetero atoms with their structure, synthesis and reactions. 3. To know stereochemistry of organic compounds; able to do interconversion of Fischer to Newmann, Newmann to Sawhorse and vice versa, Able to assign R and S to given molecules; understand stereoselective and stereospecific reactions; acquire knowledge on topicity. 4. To study structure, formation, stability and related name reaction of intermediates like Carbocation, Carbanion, Free Radical,

			Carbenes and nitrenes; Recognize neighboring group participation 5. To study rearrangement reaction with a specific mechanism and migratory aptitude of different groups. 6. To study Ylides and their reaction. 7. To understand the basis of redox reaction; acquire knowledge about the reagents which causes selective oxidation/reduction in various compounds; learn the basic mechanism of oxidation/reduction in organic compounds.
		CH-190 Chemical Biology Laboratory Practices	<p>The goal of this course is to introduce students to fundamental concepts in Chemical Biology and methods of chemistry used to solve problems in molecular and cell biology. After completion of this course, successful students will: 1) Students will be able to explore new areas of research in both chemistry and allied fields of science and technology. 2) Students will be able to function as a member of an interdisciplinary problem-solving team. 3) To impart the student's thorough idea in the chemistry of carbohydrates, amino acids, proteins, and nucleic acids, etc. 4) Be able to describe the chemical basis for replication, transcription, translation and how each of these central processes can be expanded to include new chemical matter. 5) Develop skills to critically read the literature and effectively communicate research in a peer setting.</p> <p>The second part of this section consists of a practical course in which students learn Part-I: Analysis of 1. Silica and Manganese from pyrolusite ore. 2. Aluminum and Silica from Bauxite ore. 3. silica and iron from hematite ore. 4. copper and iron from Chalcopyrite ore. Further, Alloy Analysis such as Determination of tin and lead from solder alloy. iron and chromium from a stainless steel alloy. Determination of copper and nickel from cupronickel alloy. Finally, synthesis and applications of nanomaterials such as ZnO, TiO₂ Fe₂O₃ etc carried out.</p>
		CHP107 Basic Practical Chemistry-I	<p>The course aims to perform Kinetic experiments such as 1) the Decomposition of diacetone alcohol by dilatometry. 3. Determination of an order of a reaction. 4. Brönsted primary salt effect. 5. Kinetics of oxidation of ethanol by K₂Cr₂O₇. In non-instrumental analysis students should perform the 6) Capillary rise method. 7. Determination of molecular weight by steam distillation. 8. Glycerol radius by viscosity. 9. Partial Molar Volume (Polymetry) Determination of the densities of a series of solutions and to calculate the molar volumes of the component. Techniques handled Colorimetry and spectrophotometry, GM Counter. In the second section, this course is designed to make students aware of how to perform organic compounds in the laboratory. 2. The course includes the synthesis of some derivatives and organic compounds, which will help them while working in a research</p>

			laboratory in the future. 3. Making derivatives of organic compounds will help them in industry or while doing research in medicinal chemistry for Drug development. 4. This practical course is also designed to make the student aware of green chemistry and the role of green chemistry in pollution reduction. 5. The students learn how to avoid solvents and do the solvent free reaction. 6. Also the work-up procedure in many experiments is made more eco-friendly to the environment.
	M.Sc I Semester-II Organic & Drug Chemistry	CH-210 Fundamentals of Physical Chemistry II	The course aims to provide an understanding of physical chemistry, In this course, the fundamentals of molecular spectroscopy are introduced. Students learn basic elements of rotational, vibrational, Raman, and electronic spectroscopy. Nuclear and Radiation Chemistry and their applications are introduced. Students get familiar with Chemical Bonding: Valence Bond theory, hybrid orbitals, geometry and hybridization, Molecular Orbital Theory, linear variation method, Approximations underlying Huckel theory, bond order, Aromaticity, Applications of Huckel theory.
		CH- 230 Coordination and Bioinorganic Chemistry	The student should able to find out the no of microstates and meaningful term symbols, construction of the microstate table for various configuration 2. Hund's rules for arranging the terms according to energy. 3. Students should understand interelectronic repulsion. 4. Students should know the concept of weak and strong ligand field. 5. Students able to find out splitting of the free ion terms in weak ligand field and strong ligand field. 6. To draw a correlation diagram for various configurations in Td and Oh ligand field. 7. Students should know basic instrumentation and selection rules and relaxation in rules. 8. A student should know basic d-d transition, d-p mixing, charge transfer spectra. 9. Interpretation of electronic spectra for spin allowed oh and td complexes using the Orgel diagram. 10. Understand the concept of spectrochemical series and Nephelauxetic series. 11. Should able to solve numerical based on crystal field parameters. 12. Understand the various terms involved in magnetochemistry. 13. Various phenomenons of magnetism and their temperature dependence. 14. Various experimental methods to find out magnetic moment. 15. Understand the various Quenching of orbital angular momentum. The second section gives the Importance of bioinorganic chemistry. 2) Role of metals in Metalloprotein and metalloenzymes. 3) Similarities in coordination theory for metal complexes and metal ions complexed with biological ligands. 4) Importance and

			transport of metal ions. 5) Passive transport metal ions by ionophores and gramicidin. 6) Mechanism for active transport of Na ⁺ and K ⁺ 7) Nerve impulse generation in the rod cell of retina. 8) Importance and function of Ca, Fe and Mg in metalloprotein 9) Catalytic role of Mn in photosynthesis
		CH-250 Synthetic Organic Chemistry & Spectroscopy	The first section of this course is aimed to make students familiar with. MOT and will be able to extend this in predicting reaction mechanism and stereochemistry of electrocyclic reactions. 2. The concepts in free radical reactions, mechanism, and stereochemical outcomes. The second section deals with the basic introduction to various Spectroscopic methods like UV, IR. ¹ H, ¹³ C-NMR, and Mass Spectrometry and their application in structure determination of various organic molecules. Students will be able to understand - 1 3. The basic principle of spectroscopic methods and their applications in structure elucidation of organic compounds using given spectroscopic data or spectra.
		CH-290 Basic Biochemistry	The goal of this course is to introduce students to fundamental concepts in Chemical Biology and methods of chemistry used to solve problems in molecular and cell biology. After completion of this course, successful students will: 1) Students will be able to explore new areas of research in both chemistry and allied fields of science and technology. 2) Students will be able to function as a member of an interdisciplinary problem-solving team. 3) To impart the student's thorough idea in the chemistry of carbohydrates, amino acids, proteins, and nucleic acids, etc. 4) Be able to describe the chemical basis for replication, transcription, translation and how each of these central processes can be expanded to include new chemical matter. 5) Develop skills to critically read the literature and effectively communicate research in a peer setting. 6) Describe the importance of chemical biology research and interdisciplinary work. The second part of this section consists of a practical course in which students are trained to use techniques such as pH meter, Conductometry, Potentiometry, Colorimetry, Spectrophotometry, Refractometry, and G. M. Counter. These techniques will enable them to work as quality control chemist in various labs and such organizations
		CHP -227 Basic Practical Chemistry-II	Students are trained for the preparation of various solutions, synthesis of various inorganic complexes, and their characterization. The students are trained for the handling of natural materials and their quantitative analysis which involves disintegration, separation, and individual estimations. They are trained to handle various

			equipment like spectrophotometer, flame photometer, conductometer, Chromatographic technique, etc.
			Students are trained to different purification techniques in organic chemistry like recrystallization, distillation, steam distillation, and extraction. 2. Students are made aware of safety techniques and the handling of chemicals. 3. Students are made aware of carrying out different types of reactions and their workup methods. 4. This practical course is designed to make the student aware of green chemistry and the role of green chemistry in pollution reduction.
	Ph. D	By research and one course work	Students get the research skill, novel innovations, IPR, Patenting for a new product or any methodology

Commerce

Course Outcomes

Sr. No.	Programme	Objectives	Programme Specific Objectives
1.	Bachelor of Commerce (B.Com)	<p>PO1. Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.</p> <p>PO2.Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.</p> <p>PO3.Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.</p> <p>PO4.Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.</p> <p>PO5.Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.</p> <p>PO6.Self-directed and Life-long Learning: Acquire the ability to engage in independent</p>	<p><u>F.Y.B.COM</u></p> <p>Financial Accounting :</p> <p>1. To impart the knowledge of various accounting concepts 2. To instill the knowledge about accounting procedures, methods and techniques. 3. To acquaint them with practical approach to accounts writing by using software package.</p> <p>Business Economics (Micro):</p> <p>1. To expose Students of Commerce to basic micro economic concepts and inculcate an analytical approach to the subject matter. 2. To stimulate the student interest by showing the relevance and use of various economic theories. 3. To apply economic reasoning to problems of business.</p> <p>Business Mathematics and Statistics:</p> <p>1. To prepare for competitive examinations 2. To understand the concept of Simple interest, compound interest and the concept of EMI. 3. To understand the concept of shares and to calculate Dividend 4. To understand the concept of population and sample. 5. To use frequency distribution to make decision. 6. To understand and to calculate various types of averages and variations. 7. To understand the concept and application of profit and loss in business. 8. To solve LPP to maximize the profit and to minimize the cost. 9. To use correlation and regression analysis to estimate the relationship between two variables. 10. To understand the concept and techniques of different types of index numbers.</p>

Sr. No.	Programme	Objectives	Programme Specific Objectives
		and life-long learning in the broadest context socio-technological changes	<p>Banking and Finance [Fundamentals of Banking]</p> <p>1. To acquaint the students with the fundamentals of banking. 2. To develop the capability of students for knowing banking concepts and operations. 3. To make the students aware of banking business and practices. 4. To give thorough knowledge of banking operations. 5. To enlighten the students regarding the new concepts introduced in the banking system.</p> <p>Marketing and Salesmanship [Fundamentals of Marketing]</p> <p>1) General Objective of the Paper. a) To create awareness about market and marketing. b) To establish link between commerce/Business and marketing.</p> <p>2) Core Objectives of the paper. a) To understand the basic concept of marketing. b) To understand marketing philosophy and generating ideas for marketing research. c) To know the relevance of marketing in modern competitive world. d) To develop an analytical ability to plan for various marketing strategy.</p> <p><u>S.Y.B.COM</u></p> <p>Business Communication.:</p> <p>1. To understand the concept, process and importance of communication. 2. To develop awareness regarding new trends in business communication. 3. To provide knowledge of various media of communication. 4. To develop business communication skills through the application and exercises.</p> <p>Corporate Accounting: To enable the students to develop awareness about Corporate Accounting in conformity with the provisions of Companies Act and Accounting as per Indian</p>

Sr. No.	Programme	Objectives	Programme Specific Objectives
			<p>Accounting Standards. 1. To make aware the students about the conceptual aspect of corporate accounting 2. To enable the students to develop skills for Computerized Accounting</p> <p>Business Economics (Macro):</p> <p>1. The objective of the course is to familiarize the students the basic concept of Macro Economics and application. 2. To Study the behavior of the economy as a whole. 3. To Study the relationship among broad aggregates. 4. To apply economic reasoning to problems of the economy.</p> <p>Business Management:</p> <p>1. To provide basic knowledge & understanding about business management concept. 2. To provide an understanding about various functions of management.</p> <p>Elements of Company Law:</p> <p>1) To impart students with the knowledge of fundamentals of Company Law. 2) To update the knowledge of provisions of the Companies Act of 2013. 3) To apprise the students of new concepts involving in company law regime. 4) To acquaint the students with the duties and responsibilities of Key Managerial Personnel. 5) To impart students the provisions and procedures under company law.</p> <p>Business Administration:</p> <p>1. To provide basic knowledge about various forms of business organizations 2. To acquaint the students about business environment and its implications thereon. 3. To aware them with the recent trends in business</p> <p>Cost and Works Accounting:</p> <p>To Impart The Knowledge Of: 1. Basic Cost concepts. 2. Elements of cost. 3. Ascertainment of Material and Labour Cost.</p>

Sr. No.	Programme	Objectives	Programme Specific Objectives
			<p><u>T.Y.B.COM</u></p> <p>Business Regulatory Framework (Mercantile Law):</p> <ol style="list-style-type: none"> 1. To acquaint students with the basic concepts, terms & provisions of Mercantile and Business Laws. 2. To develop the awareness among the students regarding these laws affecting business, trade and commerce. <p>Advanced Accounting:.</p> <p>To impart the knowledge of various accounting concepts To instill the knowledge about accounting procedures, methods and techniques. To acquaint them with practical approach to accounts writing by using software package.</p> <p>Indian & Global Economic Development:</p> <ol style="list-style-type: none"> 1) To expose students to a new approach to the study of the Indian Economy. 2) To help the students in analyzing the present status of the Indian Economy. 3) To enable students to understand the process of integration of the Indian Economy with other economics of the world. 4) To acquaint students with the emerging issues in policies of India's foreign trade. <p>Auditing & Taxation:</p> <p>The Study of Various Components of this course will enable the students:</p> <ol style="list-style-type: none"> 1. To acquaint themselves about the concept and principles of Auditing, Audit process, Assurance Standards, Tax Audit, and Audit of computerized Systems. 2. To get knowledge about preparation of Audit report. 3. To understand the basic concepts and to acquire knowledge about Computation of Income, Submission of Income Tax Return, Advance Tax, and Tax deducted at Source, Tax Collection Authorities under the Income Tax Act, 1961. <p>Business Administration II:</p>

Sr. No.	Programme	Objectives	Programme Specific Objectives
			<p>To acquaint the students with basic concepts & functions of HRD and nature of Marketing functions of a business enterprise.</p> <p>Cost and Works Accounting II: 1. To provide Knowledge about the concepts and principles application of Overheads 2. To provide also understanding various methods of costing and their applications</p> <p>Business Administration III: To acquaint the students with the basic concepts in finance and production functions of a business enterprise.</p> <p>Cost and Works Accounting III: 1 To impart knowledge regarding costing techniques. 2 To provide training as regards concepts, procedures and legal Provisions of cost audit.</p>
2.	Master of Commerce (M.Com)	<p>PO1.Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.</p> <p>PO2. Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.</p> <p>PO3.Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.</p>	<p><u>M.COM PART I</u></p> <p>Management Accounting The objective of the course is to enable students to acquire sound Knowledge of concepts, methods and techniques of management accounting and to make the students develop competence with their usage in managerial decision making and control.</p> <p>Strategic Management To understand the approaches to Strategic Decision Making, Strategic Management Process</p> <p>Advanced Cost Accounting: 1. To acquaint the students with the significance of Cost Accounting in Global Competitive environment. 2. To enable students to learn application of different methods of costing in Manufacturing and Service Industry.</p> <p>Costing Techniques and Responsibility Accounting : 1) To equip the students for designing and implementing cost</p>

Sr. No.	Programme	Objectives	Programme Specific Objectives
		<p>PO4.Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.</p> <p>PO5.Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.</p> <p>PO6.Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.</p> <p>PO7.Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes</p>	<p>control, cost reduction programme and different cost system. 2) Relevant Cost Accounting Standard are to be studied 3) Level of knowledge –Advanced Techniques of Costing</p> <p>Financial Analysis & Control: The objective of the course is to enable students to acquire sound knowledge of concepts, methods and techniques of management accounting and to make the students develop competence with their usage in managerial decision making and control.</p> <p>Industrial Economics: 1) To study the basic concepts of Industrial Economics. 2) To study the significance and problems of Industrialization. 3) To study the impact of Industrialization on Indian Economy.</p> <p>Application of Cost Accounting: 1. To provide knowledge on advanced cost accounting practices.</p> <p>Cost Control and Cost System: 1. To equip the students for designing and implementing cost control, cost reduction programme and different cost systems. 2. Relevant Cost Accounting Standards are to be studied.</p> <p>Business Finance: To enable students to acquire sound knowledge of concepts, nature and structure of business finance.</p> <p>Research Methodology for Business: 1. To acquaint the students with the areas of Business Research Activities. 2. To enhance capabilities of students to conduct the research in the field of business and social sciences. 3. To enable students, in developing the most appropriate methodology for their research studies.4. To make them familiar</p>

Sr. No.	Programme	Objectives	Programme Specific Objectives
			<p>with the art of using different research methods and techniques. Advanced Cost Accounting and Cost System Special Paper V. To provide adequate knowledge on Cost Audit Practices. Level of Knowledge – Advanced. Advanced Cost Accounting and Cost System Special Paper VI. To equip the students with the knowledge of the techniques and methods of planning and executing the Management Audit. Level of Knowledge: Advanced</p> <p><u>M.COM PART II</u></p> <p>Capital Market and Financial Services. To enable students to acquire sound knowledge, concept and structure of capital market and financial services. Industrial Economic Environment. 1. To study the basic concepts of Industrial Finance. 2. To study the effects of New Economic Policy. 3. To study the impact of Labor reforms on Industries.</p>

3. Courses offered

Sr. No.	Course	Course outcomes
1.	FYBCom : Financial Accounting.	1. imparted the knowledge of various accounting concepts 2. instilled the knowledge about accounting procedures, methods and techniques. 3. acquainted them with practical approach to accounts writing by using software package.
	FYBCom : Business Economics (Micro)	1. Exposed Students of Commerce to basic micro economic concepts and inculcate an analytical approach to the subject matter. 2. Stimulated the student interest by showing the relevance and use of various economic theories. 3. Applied economic reasoning to problems of business.
	FYBCom : Business Mathematics and Statistics	1. Prepared for competitive examinations 2. Understood the concept of Simple interest, compound interest and the concept of EMI. 3. Understood the concept of shares and to calculate Dividend 4. Understood the concept of population and sample. 5. Used frequency distribution to make decision. 6. To understand and to calculate various types of averages and variations. 7. Understood the concept and application of profit and loss in business. 8. Solved LPP to

Sr. No.	Course	Course outcomes
		maximize the profit and to minimize the cost. 9. Used correlation and regression analysis to estimate the relationship between two variables. 10. Understood the concept and techniques of different types of index numbers.
	FYBCom : Banking and Finance [Fundamentals of Banking]	1. The students acquainted with the fundamentals of banking. 2. Developed the capability of students for knowing banking concepts and operations. 3. Students are aware of banking business and practices. 4. Gets thorough knowledge of banking operations. 5. Enlightened with the new concepts introduced in the banking system.
	FYBCom : Marketing and Salesmanship [Fundamentals of Marketing]	1) General Objective of the Paper. a) Created awareness about market and marketing. b) Established link between commerce/Business and marketing. 2) Core Objectives of the paper. a) Understood the basic concept of marketing. b) To understand marketing philosophy and generating ideas for marketing research. c) knows the relevance of marketing in modern competitive world. d) Developed an analytical ability to plan for various marketing strategy.
2.	SYBCom : Business Communication.	1. Understands the concept, process and importance of communication. 2. Developed awareness regarding new trends in business communication. 3. Got knowledge of various media of communication. 4. Developed business communication skills through the application and exercises.
	SYBCom : Corporate Accounting	Developed awareness about Corporate Accounting in conformity with the provisions of Companies Act and Accounting as per Indian Accounting Standards. 1. Made aware the students about the conceptual aspect of corporate accounting 2. To enable the students to develop skills for Computerized Accounting
	SYBCom : Business Economics (Macro)	1. The students are familiarized with the basic concept of Macro Economics and application. 2. Understands the behavior of the economy as a whole. 3. Understands the relationship among broad aggregates. 4. Applies economic reasoning to problems of the economy.
	SYBCom : Business Management	1. Provided basic knowledge & understanding about business management concept. 2. Provided an understanding about various functions of management.
	SYBCom : Elements of Company Law	1) Imparted students with the knowledge of fundamentals of Company Law. 2) Updates the knowledge of provisions of the Companies Act of 2013. 3) Apprises new concepts involving in company law regime. 4) Acquainted the students with the duties and responsibilities of Key Managerial Personnel. 5) understands the provisions and procedures under company law.

Sr. No.	Course	Course outcomes
	SYBCom : Business Administration	1. Understands basic knowledge about various forms of business organizations 2. Gets acquainted the students about business environment and its implications thereon. 3. Students aware with the recent trends in business
	SYBCom : Cost and Works Accounting	Understands 1. Basic Cost concepts. 2. Elements of cost. 3. Ascertainment of Material and Labour Cost.
3.	TYBCom : Business Regulatory Framework (Mercantile Law)	1. Gets acquainted with the basic concepts, terms & provisions of Mercantile and Business Laws. 2. Develops the awareness among the students regarding these laws affecting business, trade and commerce.
	TYBCom : Advanced Accounting.	Gets knowledge of various accounting concepts To instill the knowledge about accounting procedures, methods and techniques. acquainted with practical approach to accounts writing by using software package. T
	TYBCom : Indian & Global Economic Development	1) Exposed to a new approach to the study of the Indian Economy. 2) Analyzes the present status of the Indian Economy. 3) understands the process of integration of the Indian Economy with other economics of the world. 4) acquainted with the emerging issues in policies of India's foreign trade.
	TYBCom : Auditing & Taxation	1. Acquainted about the concept and principles of Auditing, Audit process, Assurance Standards, Tax Audit, and Audit of computerized Systems. 2. Gets knowledge about preparation of Audit report. 3. Understands the basic concepts and acquires knowledge about Computation of Income, Submission of Income Tax Return, Advance Tax, and Tax deducted at Source, Tax Collection Authorities under the Income Tax Act, 1961.
	TYBCom : Business Administration II	Acquainted with basic concepts & functions of HRD and nature of Marketing functions of a business enterprise.
	TYBCom : Cost and Works Accounting II	1. Gets Knowledge about the concepts and principles Application of Overheads 2. Understands various methods of costing and their applications
	TYBCom : Business Administration III	Knows the basic concepts in finance and production functions of a business enterprise.
	TYBCom : Cost and Works Accounting III	1 Aware of costing techniques. 2 trains as regards concepts, procedures and legal Provisions of cost audit.
4.	MCom I : Management Accounting	Acquires sound Knowledge of concepts, methods and techniques of management accounting and develops competence with their usage in managerial decision making and control.
	MCom I : Strategic Management	Understands the approaches to Strategic Decision Making, Strategic Management Process.

Sr. No.	Course	Course outcomes
	MCom I : Advanced Cost Accounting:	1. Acquainted with the significance of Cost Accounting in Global Competitive environment. 2. Enables to learn application of different methods of costing in Manufacturing and Service Industry.
	MCom I : Costing Techniques and Responsibility Accounting :	1) Equips for designing and implementing cost control, cost reduction programme and different cost system. 2) Level of knowledge –Advanced Techniques of Costing
	MCom I : Financial Analysis & Control:	Enable to acquire sound knowledge of concepts, methods and techniques of management accounting and develops competence with their usage in managerial decision making and control.
	MCom I : Industrial Economics:	1) Understands the basic concepts of Industrial Economics. 2) Understands the significance and problems of Industrialization. 3) Understands the impact of Industrialization on Indian Economy.
	MCom I : Application of Cost Accounting:	1. Gets knowledge on advanced cost accounting practices.
	MCom I : Cost Control and Cost System:	1. Equips himself for designing and implementing cost control, cost reduction programme and different cost systems and Relevant Cost Accounting Standards.
5.	M.Com II: Business Finance:	Acquires sound knowledge of concepts, nature and structure of business finance.
	M.Com II: Research Methodology for Business:	1. Acquainted with the areas of Business Research Activities. 2. To enhance capabilities of students to conduct the research in the field of business and social sciences. 3. To enable students, in developing the most appropriate methodology for their research studies.4. To make them familiar with the art of using different research methods and techniques.

Sr. No.	Course	Course outcomes
	M.Com II: Advanced Cost Accounting and Cost System Special Paper V.	Gets advanced knowledge on Cost Audit Practices.
	M.Com II: Advanced Cost Accounting and Cost System Special Paper VI.	Equips with the advanced knowledge of the techniques and methods of planning and executing the Management Audit.
	Capital Market and Financial Services	Inculcated students to acquire sound knowledge, concept and structure of capital market and financial services.
	Industrial Economic Environment	1. Solved the basic concepts of Industrial Finance. 2. Expert the effects of New Economic Policy. 3. Skilled Labor reforms on Industries
	Recent Advances in cost accounting / Case Studies:	The students will have to select a subject from any area of the syllabus of Cost Accounting and get practical exposure by undertaking project work.

Computer Science

Department of Computer Science

1. Departmental Profile

Ahmednagar College is the first college in Ahmednagar District which opened the gates of Higher Education to the all types of the students irrespective of their caste, religion and race. The Department of Computer science was established in the year 1992. The B.C.S. / M.C.S, B.B.A(CA), BCA-Science degree courses have been introduced by the PUNE UNIVERSITY. It is the important step in the direction of educational reforms. A number of important changes have been taken place during the last decade in the corporate world and in

the business environment. These changes have brought with them new challenges which can serve new opportunities. To prepare the new generation to face challenges.

In the modern days the success of every student depends upon quick and effective adjustment with local, national and international environment. The globalisation process, the rush of multinationals into the Indian Markets and the new opportunities for the students to seek the job, the B.C.S. / M.C.S.,B.B.A (CA),BCA-Science courses help and provide opportunities to face all the problems in this new era. The MCS Course was introduced in Ahmednagar College in the year 1998, BCS in the year of 1998, Also B.C.A in the year of 2005 which is already having the A – Grade Award. At present the Principal of the college is Dr. R.J. Barnabas, the Grandson of founder Principal Rev. Dr. B.P. Hivale and the son of Rev. Prof. J. Barnabas and Dr. Sarala Barnabas. The HOD for the programme Prof. Sayyad Razak have given opportunity to the students to rise and shine. Placements are conducted every year.

2. Programmes offered

Sr. No.	Programme	Program Objectives	Programme Specific Objectives
1.	Bachelor of Computer Science B.Sc.(Comp.Sci)	<p>PO1.Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.</p> <p>PO2. Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.</p>	<p>PSO1. To develop problem solving abilities using a computer.</p> <ul style="list-style-type: none">• To build the necessary skill set and analytical abilities for developing. <p>computer based solutions for real life problems.</p> <ul style="list-style-type: none">• To imbibe quality software development practices. To create awareness about. <p>process and product standards.</p> <ul style="list-style-type: none">• To train students in professional skills related to Software Industry.• To prepare necessary knowledge base for research and development in

		PO3.Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.	Computer Science. <ul style="list-style-type: none">• To help students build-up a successful career in Computer Science.
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		<p>PO4.Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.</p> <p>PO5.Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.</p> <p>PO6.Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.</p> <p>PO7.Self-directed and Life-long Learning: Acquire the ability to engage in independent and lifelong learning in the broadest</p>	<p>stimulate the student interest by showing the relevance and use of various economic theories. 3. To apply economic reasoning to problems of business.</p> <p>PSO2. Graduates will be able to communicate effectively in both verbal and written form.</p> <p>PSO3. Graduates will demonstrate knowledge and understanding of computer science principles and apply these to manage projects and in multi disciplinary environment.</p> <p>PSO4. Graduates will show the understanding of impact of computer based solution on the society and also will be aware of contemporary issues</p> <p>PSO5. Graduates will demonstrate knowledge of professional and ethical responsibilities.</p>
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2.	Master of Computer Science M.Sc.(Comp .Sci)	<p>context socio-technological Changes.</p> <p>PO1.Self-directed and Life-long Learning: Acquire the ability to engage in independent and lifelong learning in the broadest context socio-technological Changes.</p> <p>PO2.Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate</p>	<p>PSO6. Graduates are asked to demonstrate an environmental projects to overcome the issues related to environment and have a detailed overview of environmental issue solutions.</p> <p>PSO7. Graduate will recognize the need for and have the preparation and ability to engage in independent and life long learning to participate and succeed in competitive examination and higher studies.</p> <p>PSO1.It is believed that the proposed changes as part of the credit based system will bring a qualitative change in the way M.Sc. (Computer Science) is taught, which will offer a more enriched learning experience. It aims to provide technology-oriented students with the knowledge and ability to develop creative solutions, and better understand the effects of future developments of computer systems and technology on people and society.</p>
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		<p>and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.</p> <p>PO3. Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.</p> <p>PO4.Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.</p> <p>PO5.Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.</p>	<p>PSO2. Post Graduates will be able to communicate effectively in both verbal and written form.</p> <p>PSO3. Post Graduates will demonstrate knowledge and understanding of computer science principles and apply these to manage projects and in multi disciplinary environment.</p> <p>PSO4. Post Graduates will show the understanding of impact of computer based solution on the society and also will be aware of contemporary issues</p> <p>PSO5. Post Graduates will demonstrate knowledge of professional and ethical responsibilities.</p> <p>PSO6. Post Graduates are asked to demonstrate an environmental projects to overcome the issues related to</p>
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3.	BBA(CA)	<p>PO6.Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.</p> <p>PO6.Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.</p> <p>1PO1.Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.</p>	<p>environment and have a detailed overview of environmental issue solutions.</p> <p>PSO7. Post Graduate will recognize the need for and have the preparation and ability to engage in independent and life long learning to participate and succeed in competitive examination and higher studies.</p> <p>PSO1. The objectives of the Programme shall be to provide sound academic base from which an advanced career in Computer Application can be developed. Conceptual grounding in computer usage as well as its practical business application will be provided.</p>
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		<p>PO2. Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.</p> <p>PO3.Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.</p> <p>PO4.Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.</p> <p>PO5.Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.</p>	<p>PSO2. Graduates will be able to communicate effectively in both verbal and written form.</p> <p>PSO3. Graduates will demonstrate knowledge and understanding of computer science principles and apply these to manage projects and in multi disciplinary environment.</p> <p>PSO4. Graduates will show the understanding of impact of computer based solution on the society and also will be aware of contemporary issues</p> <p>PSO5. Graduates will demonstrate knowledge of professional and ethical responsibilities.</p> <p>PSO6. Graduates are asked to demonstrate an environmental projects to overcome the issues related to environment and have a detailed overview of environmental issue solutions.</p>
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4.	BCA(Sci)	<p>PO6.Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.</p> <p>PO7.Self-directed and Life-long Learning: Acquire the ability to engage in independent and lifelong learning in the broadest context socio-technological Changes.</p> <p>PO1.Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.</p>	<p>PSO7.Graduate will recognize the need for and have the preparation and ability to engage in independent and life long learning to participate and succeed in competitive examination and higher studies.</p> <p>PSO1. Produce knowledgeable and skilled human resources which is employable in IT and ITES. Impart knowledge required for planning, designing and building Complex Application Software Systems as well as provide support to automated systems or application. Produce entrepreneurs who can develop customized solutions for small and medium Enterprises.</p> <p>PSO2.Graduates will be able to</p>
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		<p>PO2. Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.</p> <p>PO3.Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.</p> <p>PO4.Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.</p> <p>PO5.Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.</p>	<p>communicate effectively in both verbal and written form.</p> <p>PSO3. Graduates will demonstrate knowledge and understanding of computer science principles and apply these to manage projects and in multi disciplinary environment.</p> <p>PSO4. Graduates will show the understanding of impact of computer based solution on the society and also will be aware of contemporary issues</p> <p>PSO5. Graduates will demonstrate knowledge of professional and ethical responsibilities.</p> <p>PSO6. Graduates are asked to demonstrate an environmental projects to overcome the issues related to environment and have a detailed overview of environmental issue solutions.</p> <p>PSO7. Graduate will recognize</p>
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		<p>PO6.Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.</p> <p>PO7.Self-directed and Life-long Learning: Acquire the ability to engage in independent and lifelong learning in the broadest context socio-technological Changes.</p>	<p>the need for and have the preparation and ability to engage in independent and life long learning to participate and succeed in competitive examination and higher studies.</p>
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3. Courses offered

Sr. No.	Course	Course outcomes
1.	F.Y.B.Sc.(Comp Sci) : Problem Solving Using Computers and 'C' Programming (CS-111) Sem 1 Paper 1	i) To develop Problem Solving abilities using computers ii) To teach basic principles of programming iii) To develop skills for writing programs using 'C'
	Data base management system (C2) (CS102) Sem 1	Solve the real word problem, Design E-R Model Use SQL
	Computer Science Practical Paper (CS-104) Sem1 Paper 3	Problem solving in C programming and data base management system.
	Advance 'C' programming Sem 2 Paper 1(CS201)	Develop modulator program using pointer, arrays, string
	Relational Database Management System (CS202) Sem 2 Paper 2	Use data base techniques Use advance database.
	Practical Course For Advance C (CS203)	To use SQL and PL/SQL File handling in 'C'

Discrete Mathematics (MTC 112) Sem 1 Paper 2	(i) A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations, terminology and recognize basic geometrical figures and graphical displays ,state important facts resulting from their studies. (ii) A student should get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning. (iii) A student should get adequate exposure to global and local concerns that explore them many aspects of Mathematical Sciences. (iv) A student be able to apply their skills and knowledge ,that is, translate information
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	presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion. (v) A student should be made aware of history of mathematics and hence of its past, present and future role as part of our culture.
Matrix Algebra (MTC-111) Sem 1 Paper 1	(i) A student should gate knowledge of Matrix opration and inverse of matrix (ii) A student should get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning. (iii) A student should get adequate exposure to global and local concerns that explore them many aspects of Mathematical Sciences. (iv) A student be able to apply their skills and knowledge ,that is, translate information presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion. (v) A student should be made aware of history of mathematics and hence of its past, present and future role as part of our culture.

Mathematics Practical (MTC 113)	Problem on unit 1 to 4 using maxima software
Liner Algebra (MTC 121) M1 , Sem 2	1. vector spaces 2.Elgen values and Elgen Vectors 3. The geometry of vector space
Graph Theory (MTC-122) M2 Sem 2	1. Introduction to graph 2. Connected graph 3. Basic terminologies
Mathematics Practical (MTC-123) Sem 2	Problem on unit 1 to 4 using maxima software
Semiconductor Devices and Basic Electronic Systems (ELC-111) Sem 1 Ele. 1	1. To get familiar with basic circuit elements and passive components 2. To understand DC circuit theorems and their use in circuit analysis 3. To study characteristic features of semiconductor devices 4. To study elementary electronic circuits and applications 5. To understand basics of operational amplifiers.
Principles of Digital Electronics (ELC-112)	1. To get familiar with concepts of digital electronics 2. To learn number systems and their representation 3. To understand basic logic gates, Boolean algebra and K-maps 4. To study arithmetic circuits, combinational circuits and sequential circuits 5. To study comparative aspects of logic families.

Practical Course in Electronics (EL-113)	Practical base on analog and digital electronics.
Instrumentation System (ELC121) E1 Sem 2	1.Sensors Introduction to Instrumentation system, OPAMP as signal conditioner
Basic of Computer Organization (ELC122) Ele2 Sem 2	Study of F/F, Study of shift register , Basics of computer system, Memory Organization.
Electronics Lab (ELC 123) Paper 3 Sem 2	Practical base on Paper 1 and paper 2
Descriptive Statistics (CSST-111) Paper 1 Sem 1	The syllabus of Statistics for First Year of this course covers basic concepts Presentation of Data, mean mode, median, Moments, Attributes.
Mathematical Statistics (CSST-112) Paper 2	The syllabus of Statistics for First Year of this course covers basic concepts and terminology in Statistics and

		Probability, Events, Bays theorem , Random variable, Geometric distribution.
	Statistics Practical (CSST-113) Sem 1 Paper 3	To use various graphical and diagrammatic techniques. To compute various measures of central tendency. To study free statistical software and use them for data analysis.
	Method of applied Statistics (CSST - 121) Paper 1 Sem 2	Correlation Multiple regression, Time series and multiple Partial correlation.
	Continuous Probability Distributions and Testing Hypothesis (CSST-122) paper 2 Sem 2	Standard continuous probability , distributions, uniform distribution , Normal distribution, Testing of hypothesis
	Statistics Practical (CSST-123) Sem 2 paper 3	To generate model sample from given distribution , To understand the relationship between two variable using scatter plot,
2.	S.Y.B.Sc.(Comp Sci) Data Structures using 'C' (CS-211)	To learn systematic way of problem solving. To understand the different methods of organizing large amount of data. To efficiently implement the different data structures. To efficiently implement solutions for specific problems.
	Relational Database Management System (CS-212)	To teach fundamental concepts of RDBMS (PL/PgSQL). To teach principles of databases. To teach database management operations. To teach data security and its importance. To teach client server architecture.

Digital system hardware(ELC 211)	To study the application of logic gates. To use K-maps for digital circuit design. To study and understand basics of microprocessors. To understand fundamentals of multicore technology.
Analog systems (ELC 212)	To understands basics of analog electronics. To study different types of sensors. To understands different types of signal conditioning circuits. To learn data conversion techniques. To apply knowledge of analog systems in different applications.
Applied algebra (MTC 211)	Student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations ,terminology and recognize basic geometric figures and graphical displays state important facts resulting from their studies.

	<p>A student should get a relational understanding of mathematical concepts and concerned structures and should be able to follow the patterns involved mathematical reasoning.</p> <p>A student should get adequate exposure to global and local concerns that explore them many aspects of mathematical sciences.</p> <p>A student be able to apply their skills and knowledge that is translate information presented verbally into mathematical form select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion.</p> <p>A student should be made aware of history of mathematics and hence of its past , present and future role as part of our culture.</p>
Numerical analysis (MTC 212)	<p>Student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations ,terminology and recognize basic geometric figures and graphical displays state important facts resulting from their studies.</p> <p>A student should get a relational understanding of mathematical concepts and concerned structures and should be able to follow the patterns involved mathematical reasoning.</p> <p>A student should get adequate exposure to global and local concerns that explore them many aspects of mathematical sciences.</p> <p>A student be able to apply their skills and knowledge that is translate information presented verbally into mathematical form select and use appropriate mathematical formulae or techniques in order to</p>

	<p>process the information and draw the relevant conclusion.</p> <p>A student should be made aware of history of mathematics and hence of its past , present and future role as part of our culture.</p>
Technical English (EN 211)	
object oriented concepts using C++ (CS 221)	<p>Acquire an understanding of basics object oriented concepts and the issues involved in effective class design. Write C++ programs that use object oriented concepts such as information hiding, constructors, destructors, inheritance etc.</p>
Data structures Practicals and C++ Practicals (CS-223)	
software engineering (CS 222)	<p>To teach basics of system analysis and design. To teach principles of software engineering. To teach various process models used in practice. To know about the system engineering and requirements engineering. To build analysis model.</p>
Database Practical & Mini Project using Software Engineering techniques (CS-224)	
The 8051 architecture interfacing and programming (ETC 221)	<p>To study the basics of 8051 microcontroller. To study the programming and interfacing techniques of 8051. To apply knowledge of 8051 to design different application circuits.</p> <p>To introduce the basic concepts of advanced microcontrollers.</p>

Communication principles (ETC 222)	To understands basics of communication systems. To understand modulation, demodulation and multiplexing of signals. To understands digital communication techniques. To introduce concepts in advanced wireless communication.
Practical Course (ELC 203)	
MTC 221 Computational geometry	<p>Student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations ,terminology and recognize basic geometric figures and graphical displays state important facts resulting from their studies.</p> <p>A student should get a relational understanding of mathematical concepts and concerned structures and should be able to follow the patterns involved mathematical reasoning.</p> <p>A student should get adequate exposure to global and local concerns that explore them many aspects of mathematical sciences.</p> <p>A student be able to apply their skills and knowledge that is translate information presented verbally into mathematical form select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion.</p> <p>A student should be made aware of history of mathematics and hence of its past , present and future</p>

		role as part of our culture.
	MTC 222 Operations research.	<p>Student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations ,terminology and recognize basic geometric figures and graphical displays state important facts resulting from their studies.</p> <p>A student should get a relational understanding of mathematical concepts and concerned structures and should be able to follow the patterns involved mathematical reasoning.</p> <p>A student should get adequate exposure to global and local concerns that explore them many aspects of mathematical sciences.</p> <p>A student be able to apply their skills and knowledge that is translate information presented verbally into mathematical form select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion.</p> <p>A student should be made aware of history of mathematics and hence of its past , present and future role as part of our culture.</p>
	Practical Course in Mathematics (MT-223)	
	Technical English (EN 221)	
3.	T.Y.B.Sc.(Comp Sci) : System programming (CS 331)	To understand the design structure of simple editor. To understand the design structure of assembler and micro processor for an hypothetical simulated computer. To

		understand the working of linkers and loaders and other development utilities. To understand complexity of operating system as a software.
	Theoretical computer science (CS 332)	To have an understanding of finite state and pushdown automata. To have a knowledge of regular languages and context free languages. To know the relation between regular language, context free language and corresponding recognizers. To study the turing machine and classes of problems.
	Computer networks I (CS 333)	This course will prepare students in basic networking concepts. Understand different types of networks various topologies and application of networks. Understands types of addresses data communication. Understand the concepts of networking models protocols functionality of each layer. Learn basic networking hardware and tools.
	Internet programming I (CS 334)	Learn core PHP server side scripting language. Learn PHP Database handling.
	Programming in java I (CS 335)	To learn object oriented programming language. To handle abnormal termination of a program using exception handling. To create flat files. To design user interface using swing and AWT.
	Object oriented software engineering (CS 336)	Knowledge of object oriented concepts. Knowledge of classical software engineering.

Operating system (CS 341)	To understand design issues related to process management and various related algorithms. To understand design issues related to memory management and various related algorithms. To understand design issues related to file management and various related algorithms.
Practical paper I (CS 347)	
Compiler construction (CS 342)	To understand design issues of lexical and use of lex tool. To understand design issues of a parser and use of yacc tool. To understand issues related to memory allocation. To understand and design code generation schemes.
Compiler Networks II (Cs 343)	This course prepare students in basics of networking concepts. Understand wired and wireless networks its types functionality of layers. Understand importance of network security and cryptography.
Internet programming II (CS 344)	Learn different technologies used at client side scripting language. Learn XML,CSS AND XML parsers. One php framework for effective design of web applications. Learn JavaScript to program the behaviour of web pages. Learn AJAX to make our application more dynamic.
PROGRAMMING IN JAVA II(CS 345)	To learn database programming using java. To study web development concept using servlet and JSP. To develop a game application using multithreading. To learn socket programming concepts.

	Computer graphics (Cs 346)	<p>To study how graphics objects are representation computer.</p> <p>To study how graphics system in computer supports presentation of graphics information.</p> <p>To study how interaction is handles in a graphics system.</p> <p>To study how to manipulate graphics object by applying different transformations. To provide the programmers perspective of working of computer graphics.</p>
	Practical paper II CS 348	
4.	M.Sc. I(Comp Sci): CSUT111Paradigm of Programming Language	<ul style="list-style-type: none"> This course will prepare you to think about <ul style="list-style-type: none"> To Prepare student to think about programming languages analytically: <ul style="list-style-type: none"> Separate syntax from semantics Compare programming language designs Understand their strengths and weaknesses Learn new languages more quickly Understand basic language implementation techniques Learn small programs in different programming Languages
	CSUT112Design and Analysis of Algorithm	<p>To design the algorithms • To select the appropriate algorithm by doing necessary analysis of algorithms • To learn basic Algorithm Analysis techniques and understand the use of asymptotic notation • Understand different design strategies • Understand the use of data structures in improving algorithm performance • Understand classical problem and solutions • Learn a variety of useful algorithms • Understand classification of problems • To provide foundation in algorithm design and analysis • To develop ability to understand and design algorithmsin context of space and time complexity.</p>

	CSUT113 Database Technologies	<ul style="list-style-type: none"> • Provide an overview of the concept of NoSQL technology. • Provide an insight to the different types of NoSQL databases • Make the student capable of making a choice of what database technologies to use, based on their application needs
	CSDT 114C Web Services	<p>To understand the details of web services technologies like WSDL,UDDI, SOAP</p> <ul style="list-style-type: none"> • To learn how to implement and deploy web service client and server • To explore interoperability between different frameworks • To understand the concept of RESTful system

CSDP114C: Web Services Practical Assignments	<ul style="list-style-type: none"> To understand how to develop web services using Java/PHP/.Net
CSUP115: PPL and Database Technologies Practical	To understand and gain the knowledge of the subject
CSUT121 Advanced Operating System	This course teaches Advanced Operating Systems Concepts using Unix/Linux. This course strikes a delicate balance between theory and practical applications In fact, most Units start with the theory and then switches focus on how the concepts are implemented in a C program. This course describes the programming interface to the Unix/Linux system - the system call interface. It is intended for anyone writing C programs that run under Unix/Linux. This course provides an understanding of the functions of Operating Systems. It also provides provide an insight into functional modules of Operating Systems. It discusses the concepts underlying in the design and implementation of Operating Systems.

CSUT122 Mobile Technologies	To impart basic understanding of the wireless communication systems. To expose students to various aspects of mobile and ad-hoc networks. Understand the issues relating to Wireless applications Understand the Mobile security
CSUT123 Software Project Management	<ul style="list-style-type: none"> • Software Metrics and Project Management covers skills that are required to ensure successful medium and large scale software projects. • It examines Requirements Elicitation, Project Management, Verification & Validation and Management of Large Software Engineering Projects. • Students learn to select and apply project management techniques for process modeling, planning, estimation, process metrics and risk management; perform software verification and validation using inspections, design and execution of system test cases.
CSDT124A: Project Guidelines CSDP124A: Project Related Assignments	To enhance practical subject

CSDT124C Computing	Soft	To introduce the ideas of soft computational techniques based on human experience. To generate an ability to design, analyze and perform experiments on real life problems using various Neural Learning Algorithms. To conceptualize fuzzy logic and its implementation for various real world applications. To apply the process of approximate reasoning using NeuroFuzzy Modeling. To provide the mathematical background to carry out optimization using genetic algorithms.
CSDP124C: Computing Practical Assignment	Soft	-To understand and gain the knowledge of the subject
CSUP125C: Practical on Advance os and mobile technologies		To enhance subject and programming environment of Unix To enhance subject and create apps with android

5.	M.Sc. II(Comp Sci): Software Metrics and Project Management (Cs 301)	
	Mobile computing (Cs 302)	

	Soft computing (Cs 303)	
	Project (Cs 304)	



B.P.H.E.Society's

Ahmednagar College, Ahmednagar

Department of Computer Science

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0241-2359571 Extn. 258

	Database and system administrator (Cs 305)	
	Business intelligence (Cs 306)	
	Industrial training/institution project (CS 401)	

6	F.Y.BBA(CA): Business Communication (101)	To prepare students for the challenges of a society that is shaped by communication. As participants in the program, students develop and integrate knowledge, creativity, ethical practice, and skills. Students also examine and produce work in oral, written, and visual communication and practice skills in group and intercultural communication.
	Principles of Management (102)	Students will examine the fundamental roles and processes of planning, leading, organizing and controlling that comprise the <i>managers'</i> role. It focuses on the entire organization from both a short and long-term perspective for strategic vision, setting <i>objectives</i> , crafting a strategy and then implementing it.
	C Language (103)	i)To develop Problem Solving abilities using computers ii) To teach basic principles of programming iii) To develop



B.P.H.E.Society's

Ahmednagar College, Ahmednagar

Department of Computer Science

		skills for writing programs using 'C'
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Database Management System (104)	<p>This course is intended to provide you with an understanding of the current theory and practice of database management systems. To help you more fully appreciate their nature, the course provides a solid technical overview of database management systems, using a current database product as a case study. In addition to technical concerns, more general issues are emphasized. These include data independence, integrity, security, recovery, performance, database design principles, and database administration.</p> <p>1) To equip the students to understand the impact that individual, group & structures have on their behavior within the organizations.</p> <p>2) To help them enhance and apply the knowledge they have received for the betterment of the organization.</p>
Statistics(105)	<p>The syllabus of Statistics for First Year of this course covers basic concepts and terminology in Statistics and covers basic tools and methods required for data analysis. The teachers teaching this syllabus and students should give emphasis on understanding the concepts and ability to apply statistical tools and techniques and not on the theoretical discussion. It is expected that at the end of the course, a student should be well equipped to learn and apply acquired techniques in computer based applications.</p>
Computer Laboratory Based On (103 and 104)	Computer practical on C Language and DataBase Management System
Add-On(PPA)(107)	
Organization Behavior and Human Resource Management (201)	<p>1. To understand the power of excel spreadsheet in computing summary statistics.</p> <p>2. To understand the concept of various measures of central tendency and variation and their importance in business.</p> <p>3. To understand the concept of probability, probability distributions and simulations in business world and decision making.</p> <p>Human Resource Management provides application-based</p>

		<p>knowledge in staffing, training, negotiation, dispute resolution, compensation, organizational behavior and leadership strategies in businesses. This program prepares you to enter and excel in the human resources arena, generating approaches and solutions for managing a business' most valuable resource: its employees.</p>
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Financial Accounting (202)	<p>Meaning and Scope of Accounting: Need, development, and definition of accounting; Bookkeeping and accounting; Persons interested in accounting; Disclosures; Branches of accounting; Objectives of accounting.</p> <p>Accounting Principles: International Accounting Standards (only outlines); Accounting principles; Accounting Standards in India</p> <p>Accounting transactions: Accounting Cycle; Journal; Rules of debit and credit; Compound journal entry; Opening entry; Relationships between Journal and Ledger; Rules regarding posting; Trial balance; Subdivisions of a journal.</p> <p>Capital and Revenue: Classification of income; Classification of expenditure; Classification of receipts Accounting concepts of income; Accounting concepts and income measurement; Expired costs and income measurement Final Accounts; Manufacturing account; Trading account; Profit and loss account; Balance Sheet; Adjustment entries, Rectification of errors; Classification of errors; Location of errors; Suspense accounts; Effects on profit.</p>
Business Mathematics (203)	<p>1. Understanding basic terms in the areas of business calculus and financial mathematics,</p> <p><input type="checkbox"/> <input type="checkbox"/> Independently solving of business problems.</p> <p>2. .</p>

7.	Relational Database (204)	<p>1) Enables students to understand relational database concepts and transaction management concepts in database system.</p> <p>2) Enables student to write PL/SQL programs that use: procedure, function, package, cursor and trigger.</p>
	Web-Technology (205)	<p>1. Think critically about how to solve a problem using programming</p> <p>2. Write JavaScript programs using functions, for loops, and conditional statements</p> <p>3. Use HTML to construct a web page with paragraphs, divs, images, links, and lists;</p> <p>4. Add styles to a web page with CSS IDs and classes; and</p> <p>5. Make a web page interactive with JavaScript commands like alert, onClick, onChange, adding input features like an image canvas, button, and slider.</p> <p>5. To know & understand concepts of internet programming.</p>
	Lab course(206) based on 204 and 205	Practical on Relational Database and Web Technology
	Add-On(207) Advanced C and RDBMS	Practical based on Advanced C (pointers, enumeration, graphics) and Rdbms(relations, procedure, cursor, trigger).
	SYBBA (CA): RDBMS (Relational Database Management System)(301)	<p>1.</p> <p>2. To understand different methods of organising large amounts of data</p> <p>3. To efficiently implement different data structure</p> <p>4. To efficiently implement solution for different problems</p> <p>5. To get more knowledge on C programming language</p>
	Lab Course	

	<p>Data Structure Using C (302)</p> <p>Lab Course</p> <p>Introduction to Operating System(303)</p> <p>Business Mathematics (304)</p> <p>Software Engineering (305)</p> <p>Object Oriented Programming Using C++ (401)</p>	<p>1. To know system programming</p> <p>2. To know services provided by operating system</p> <p>3. To know the Scheduling concepts</p> <p>1.Understanding basic terms in the areas of business calculus and financial mathematics,</p> <p>□ □ Independently solving of business problems.</p> <p>This course enables students to understand system concepts and itsapplication in Software development.</p> <p>1. Acquire an understanding of basic object-oriented concepts and the issues involved in effective class design.</p> <p>2. Enables student to write C++ programs that use: object-oriented concepts such as information hiding, constructors, destructors, inheritance.</p> <p>To learn properties and events, methods of controls and how to handle events of different controls..To understand the use of active controls and how to design VB application. To learn connectivity between VB and databases.</p>
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	Lab Course	
	Programming in Visual Basic (402)	<ol style="list-style-type: none"> 1. To know about computer network. 2. To understand different topologies used in networking 3. To learn different types of network. 4. To understanding the use of connecting device used in network.
	Lab Course	
	Computer Networking(403)	<ol style="list-style-type: none"> 1. To know what is ERP. 2. To learn different ERP technologies.
	Enterprise Resource Planning and Management. (404)	<p>To acquaint the students with the Human Resource Management its different</p> <p>functions in an organization and the Human Resource Processes that are concerned with planning, motivating and developing suitable employees for the benefit of the organization</p>
	Human Resource Management (405)	<ul style="list-style-type: none"> • Students will be able to program Java classes and methods using a subset of data types and using assignment, method calls, while loops, for loops,

		<p>6. To understand how to develop web based applications using PHP.</p>
	<p>Dot Net Programming (503)</p> <p>Lab Course</p>	<p>1. Students will be able to design web applications using .NET</p> <p>2. Students will be able to use .NET controls in web applications.</p> <p>3. Students will be able to debug and deploy .NET web applications</p> <p>4. Students will be able to create database driven .NET web applications and web services</p> <p>5. This will introduce visual programming and event driven programming practically.</p> <p>6. This will enhance applications development skill of the student.</p>
	<p>Object Oriented Software Engineering(504)</p>	<p>1. To Understand concept of system design using UML.</p> <p>2. To understand system development through object oriented techniques.</p>
	<p>Advanced Web Technologies(601)</p>	<ul style="list-style-type: none"> • Student is able to understand and use the basics of the XML based technologies

		<ul style="list-style-type: none"> • Student is able to understand and define and utilize the Web Services / Windows Communication Foundations concept • Student is able to describe how Web Services can be used to implement Service Oriented Architecture (SOA) • Student is able to design and implement user interfaces based on the AJAX technology <p>To know & understand concepts of internet programming. To understand the concepts of XML and AJAX.</p>
	Lab Course	
	Advanced Java (602)	<ol style="list-style-type: none"> 1. To know the concept of Java Programming. 2. To understand how to use programming in day to day applications. 3. To develop programming logic..
	Lab Course	
	Recent Trends in IT (603)	<ol style="list-style-type: none"> 1. To introduce upcoming trends in Information technology. 2. To study Eco friendly software development.
	Software Testing (604)	<ol style="list-style-type: none"> 1. To know the concept of software testing. 2. To understand how to test bugs in software. 3. To develop programming logic.

9.	<p>F.Y..BCA(Sci) Fundamentals of computer(BCA111)</p> <p>Problem solving and C programming(BCA112)</p> <p>Applied mathematics I (BCA113)</p> <p>BusinessCommunication (BCA114)</p> <p>BCA115 Fundamentals of computers Laboratory</p> <p>BCA 116 C Programming Laboratory</p> <p>BCA 117 Applied</p>	<p>The objective of this course is to study the basics of computer system and to learn how to configure computer devices.</p> <p>This objective of course is to provide a board overview of problem solving techniques and use of c language programming to solve these problems.</p> <p>The objective of this course is to study the applied mathematics.</p> <p>Design and implementing c programs for simple problems. Understand appropriate use of data types and structures. Understand use of appropriate control structures.</p> <p>The objective of this course is to provide a broad overview of architecture and functioning of computer systems and</p>
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	<p>Mathematics Laboratory</p> <p>BCA 118 Business Communication Laboratory</p>	
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10.	Computer organization(BCA121)	learn the basic concepts behind the architecture and organization of computers.
	Advanced programming in c (BCA122)	Objective of this course is to study the advanced programming in c.
	Operating System Concepts(BCA123)	.
	Database Management System-I(BCA124)	The objective of this course is to study the basics DBMS and to learn SQL.
	Computer Organisation Laboratory(BCA125)	
	Advanced Programming Laboratory(BCA126)	To study the various structures or methods of organizing data in computer's memory and efficiently implement them.
	Operating System Laboratory(BCA127)	
	Database Management System-I Laboratory(BCA128)	<ul style="list-style-type: none"> •To study fundamental concepts of RDBMS (PL/Pgsql) •To study database management operations •To study data security and its importance •To study client server architecture
	S.Y.BCA(Sci) Data structure (301)	
	Advanced RDBMS(302)	The Objective of this course is to understand system concepts, to know about software engineering and its application in Software development.

Software Engineering(303)	To prepare students with basic networking concepts: data communication, protocols and standards, various topologies and applications of network.
Introduction to computer network(304)	
Lab I 305	•Understand object oriented programming: oBe able to explain the difference between object oriented programming and procedural programming.
Lab II 306	oBe able to program using C++ features such as Class, objects, operator overloads, dynamic memory allocation,inheritance and polymorphism, file I/O,exception handling, etc.
C++ (401)	oBe able to build C++classes using appropriate encapsulation and design principles. •Improve problem solving skills: oBe able to apply object oriented or non-object oriented techniques to solve bigger computing problems
Introduction to web technology(402)	
Network security(403)	
OOSE(404)	
Lab I(405)	

11.	<p>LabII(406)</p> <p>Cloud computing(407)</p> <p>T.Y.BCA(Sci)</p> <p>Java programming (501)</p> <p>Advanced web technology (502)</p> <p>Software quality assurance (503)</p> <p>Operating system (504)</p>	<p>The syllabus aims in equipping students with</p> <p>To understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.</p> <p>To handle abnormal termination of a program using exception handling</p> <p>1. To know & understand concepts of internet programming.</p> <p>1. To understand the basic of quality software and quality factors.</p> <p>2. To understand software quality architecture and component.</p> <p>3. To understand software project life cycle, infrastructure and software quality standards.</p> <p>1. To understand the objectives, structure and functions of operating system</p> <p>2. To learn about concept of processes, threads and its scheduling algorithms</p> <p>3. To understand design issues in process synchronization and deadlock management</p>
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	<p>Lab course I (505) Lab course I (506)</p> <p>Soft computing (507)</p> <p>Andriod programming(601)</p> <p>Python programming (602)</p> <p>Recent trends in IoT(603)</p>	<p>4. To study various memory management schemes 5. To learn about concept file and I/O management in detail.</p> <p>1. To learn the concept of soft computing. 2. Understand different soft computing techniques like Genetic Algorithms, Fuzzy Logic , Neural Networks and their combination.</p> <p>Theobjective of this course is to understand the Android Operating System and develop applications using Google's Android open-source platform.</p> <p>•To introduce various concepts of programming to the students using Python. •Students should be able to apply the problem solving skills using Python</p> <p>1.The Internet of Things (IoT) is aimed at enabling the interconnection and integration of the physical world and the cyber space. 2.To learn about SoC architectures, programming Raspberry Pi and implementation of internet of things and protocols.</p>
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	<p>Data Analytics (604)</p> <p>Lab I(605) Lab II(606)</p> <p>Green computing (607)</p>	<p>1 Able to apply fundamental algorithmic ideas to process data. 2.Learn to apply hypotheses and data into actionable Predictions.</p> <p>1.Building more energy -efficient computing systems as well as building computing technology that increases energy -efficiency of other physical systems. 2. Investigate recent advances in the broad realm of green technologies to save energy and reduce the carbon footprint of modern computing and engineered systems. 3.A holistic coverage is given ranging from single device issues to algorithms for reducing power consumption of data centers, transportation systems, and smart buildings.</p>
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Economics

Department of Economics

Courses offered at Undergraduate Level (B.A. Economics)

Sr. No.	Program	Program Objectives	Program Specific Outcomes
01.	B.A. Economics	<p>To familiarize the students with the recent developments in the Indian Economy</p> <ul style="list-style-type: none"> · To provide the students with the background of the Indian Economy with focus on contemporary issues like economic environment. · To help the students to prepare for varied competitive examinations · To enable students to understand and comprehend the current business scenario, agricultural scenario and other sector growth in the Indian context. To make the student aware of the developments such as MSMEs, Digital Economy, E-Banking, BPO & KPO, etc. 	<ul style="list-style-type: none"> · Ability to develop an understanding of the economic environment and the factors affecting economic environment. · Ability to develop awareness on the various new developments in the different sectors of an economy – agriculture, industry, services, banking, etc. · Ability to compare and contrast Indian Economy with other world economies. · At the end of the course, the student should be able discuss and debate on the various issues and challenges facing the Indian Economic Environment.

Sr. No.	Course	Course Outcome
F. Y. B. A. (G-1 Indian Economic Environment) 2019-20		
01.	Unit 1	<p>Introduction-</p> <p>1.1 Meaning, Factors affecting Economic Environment- Economic, Political, Technological, Social & Cultural</p> <p>1.2 Challenges to Indian Economy: Natural Resources, Energy Resources, Education, Health, Environment</p> <p>1.3 Comparison of Indian Economy with the World Economy- Population, Agriculture, Industry and Service Sector</p>
	Unit 2	<p>Agricultural Environment -</p> <p>2.1 Role of Agriculture in Indian Economy</p> <p>2.2 Challenges to Indian Agriculture-Productivity, Rural Credit, Marketing, Rural Entrepreneurship, Recent Trends in Indian Agriculture: Cropping pattern, Technology, Crop Insurance, Water Management, Agri-Business</p>
	Unit 3	<p>Industrial Environment-</p> <p>3.1 Role of Industry in Indian Economic Development</p> <p>3.2 Industrial Policy Resolution, 1991- Liberalization, Privatization and Globalization (LPG)</p> <p>3.3 Challenges to Indian Industry-Labour & Employment, Regional Imbalance, Finance, Technology</p> <p>3.4 Micro, Small and Medium Enterprises (MSME)- Definition & Role</p> <p>3.5 Recent trends in Indian Industry- Indian Multinationals & New Policies</p>
Semester -II		
	Unit 1	Service Sector Environment -

		1.1 Role and Growth of Service Sector in Indian Economy 1.2 Challenges to Indian Service sector- Business-based & Knowledge-based Sector, Education sector, Health sector, Insurance, Tourism, Banking 1.3 Recent Trends in Indian Service Sector- Digital Economy, E-Commerce, E- Finance
	Unit 2	Banking Environment - 2.1 Banking- Definition, Functions, Changing Structure of Banking in India- New, Private Banks, Small Banks, Payment Banks 2.2 Bank Accounts- Types, Procedure and Operation of Accounts 2.3 Recent Trends in Indian Banking Environment- E-Banking, E- Wallets, Bank Mergers and Amalgamations
	Unit 3	Overview of Indian economy - 3.1 Challenges of Indian Economy- Poverty, Employment, Inequality, Informal Sector 3.2 Policy Measures (Two-Three recent Programmes)- Poverty Alleviation Programmes; Employment Generation Programmes; Agriculture Development Programmes, Skill Development Programmes
S.Y.B.A. (G.2 Modern Banking) 2014-15		
01.	Chapter-I	Evolution of Modern Banking 1.1 Meaning & Definition of Bank. 1.2 Banking in Europe, USA & Asia. 1.3 Evolution of Banking in India. 1.4 Structure of Indian Banking System
	Chapter-II	Functions of Commercial Banks 2.1 Primary Functions-Accepting Deposits, Granting Loans & Advances. 2.2 Secondary Functions-Agency Functions, General Utility Functions 2.3 Methods of Remittances.
	Chapter-III	Principles of Commercial Banks 3.1 Liquidity, Profitability and Safety- Meaning & Concept. 3.2 Multiple Credit Creation-Process & Limitations. 3.3 Components of Balance Sheet of Commercial Banks
	Chapter-IV	Operation & Types of Accounts 4.1 Opening and operating of Deposit Account. 4.2 Closure and Transfer of Accounts 4.3 Types of Account Holders - Individual & Institutional 4.4 No Frills Account, Escrow Account
	Chapter-V	Negotiable Instruments 5.1 Promissory Note, Bill of Exchange and Cheque - meaning, Definition & Characteristics 5.2 Types of Cheque – Bearer, Order & Crossed 5.3 Types of Crossing- General & Special 5.4 Endorsement- Definition, Types & Effects
	Chapter-VI	New Technology in Banking 6.1 E-Banking – Need and Importance 6.2 Meaning, concept and operation of - 6.2.1 Automated Teller machine- ATM 6.2.2 Credit Card 6.2.3 Debit Card 6.2.4 Tele Banking 6.2.5 Mobile Banking

		6.2.6 Net Banking 6.2.7 Society for worldwide Interbank Financial Telecommunication 6.2.8 Core Banking 6.2.9 RTGS
	Chapter-VII	Reserve Bank of India 7.1 Functions 7.2 Money Measures- M0, M1, M2, M3, M4 7.3 Monetary policy- Meaning & objectives 7.4 Instruments of Credit Control
	Chapter-VIII	Co- operative banking in India 8.1 Structure of Co-operative banking in India 8.2 97th Constitutional Amendment in co-operative law 8.3 NABARD- objectives, Functions & working 8.4 Challenges before co-operative Banking
S.Y.B.A. (S. 1 Micro Economics) 2014-15		
02.	Chapter-I	Introduction 1.1 Micro Economics – Meaning, Nature Scope, importance & limitations., 1.2 Basic Economic Problems. 1.3 Tools of Economic Analysis – Functional relationships, Schedules, Graphs & Equations. 1.4 Variable – Dependent and Independent variable-Exogenous & Endogenous.
	Chapter-II	Demand Analysis 2.1 Utility – Meaning, Concept & Assumptions 2.2 Cardinal Utility- Law of Diminishing Marginal Utility. 2.3 Ordinal Utility – Indifference curve - Concept and Properties, Consumer Equilibrium 2.4 Demand- concept & law 2.5 Elasticity of Demand 2.5.1 Price Elasticity-Definition, Types, Determinants, Importance. 2.5.2 Income Elasticity - Types & Importance, 2.5.3 Cross Elasticity- concept
	Chapter-III	Supply Analysis 3.1 Meaning, Concept & Determinates. 3.2 Law of Supply. 3.3 Elasticity of Supply.
	Chapter-IV	Theory of Production 4.1 Production function. 4.2 The law of Variable Proportions. 4.3 Law of returns to scale. 4.4 Revenue concept-Total, Average & Marginal Revenue. 4.5 Cost concepts: Fixed & Variable Cost, Opportunity cost, Average & Marginal cost, Total cost.
	Chapter-V	Market Structure 5.1 Meaning & Classification 5.2 Perfect Competition: Concept- Characteristics, price determination in short run and long run, equilibrium of the firm and industry 5.3 Monopoly- Concept, Characteristics and short and long run Equilibrium. Price discrimination

		5.4 Monopolistic Competition : Concept, Characteristics, short & long run Equilibrium, Selling cost- concept 5.5 Oligopoly – Concept, Characteristics 5.6 Duopoly – Concept, Characteristics
	Chapter-VI	Factor Pricing 6.1 The Marginal Productivity Theory of Distribution. 6.2 Rent – Ricardian Theory of Rent, Modern Theory of Rent, Quasi Rent 6.3 Wages –Modern Theory of Wages, Collective Bargaining , Supply curve of Labour 6.4 Interest- Loanable Funds Theory , Keynesian Liquidity preference theory 6.5 Profit – Risk and Uncertainty Theory , Innovation Theory
	Chapter-VII	Welfare Economics 7.1 Definition and meaning 7.2 Social Welfare Function. 7.3 Pigovian Welfare Economics 7.4 Thought of Amartya Sen on Welfare Economics.
S.Y.B.A. (S. 2 Macro Economics) 2014-15		
03.	Chapter-I	Introduction 1.1 Meaning, Nature, Scope, Importance and Limitation of Macroeconomics 1.2 Difference between Micro and Macro Economics
	Chapter-II	National Income 2.1 Concepts: National Income, Gross National Product, Net National Product, Per Capita Income, Disposable Income. 2.2 Importance of National Income. 2.3 Methods of National Income Measurement 2.4 Difficulties in Measurement of National Income 2.5 Circular Flow of National Income
	Chapter-III	Theory of Employment 3.1 Say's Law of Market 3.2 Classical Theory of Employment 3.3 Criticism by Keynes on Classical Theory 3.4 Keynesian Theory of Employment
	Chapter-IV	Consumption and Investment 4.1 Meaning of Consumption Function 4.2 Average and Marginal Propensity to Consume 4.3 Psychological Law of Consumption 4.4 Factors influencing Consumption Function 4.5 Saving- concept & Function 4.6 Investment- Meaning & Types 4.7 Investment Multiplier- Concept and Limitations 4.8 Principle of Acceleration - Concept
	Chapter-V	Value of Money 5.1 Money- Definition and Functions 5.2 Quantity Theory of Money 5.3 Cash balance approach
	Chapter-VI	Inflation and Deflation: 6.1 Inflation - Meaning and Causes 6.2 Demand Pull and Cost Push Inflation 6.3 Effects of Inflation 6.4 Measures to control Inflation

		6.5 Deflation- Meaning, Causes and Consequences
	Chapter-VII	Business Cycles 7.1 Meaning and Features of Business Cycle 7.2 Phases of Business Cycle 7.3 Causes and Effects of Business Cycle. 7.4 Control of Business Cycles- Monetary and Fiscal Controls
	Chapter-VIII	Macroeconomic Objectives and Policies 8.1 Macroeconomic Objectives 8.2 Monetary Policy- Meaning and Definitions, Instruments, Advantages and Limitations 8.3 Fiscal Policy- Meaning and Definitions, Instruments and Advantages

DEPARTMENT OF ENGLISH

Programme Outcomes:

B.A. / B.Com. English

After successfully completing B.A. / B.Com. English Programme students will be able to:

1. Comprehension Skills: The students will be able to comprehend the evolution of different categories of literature such as short story, drama, poetry, fiction and non-fiction.
2. Critical Thinking: Analyse works of literature by employing various important critical approaches and their tenets. The students will be able to implement literary devices to discuss literary texts among their peers. They will be able to familiarize themselves with the terminology in critical appreciation of varied forms of literature.
3. Effective Communication: The students will be able to develop oral and written communication skills in English. They will be able to enrich their vocabulary and its usage in communication. The students will be able to apply grammatical rules to day to day spoken and written language.
4. Effective Communication: Capable of oral and written scientific communication, and will prove that they can think critically and work independently.
5. Social Interaction: The students will be able to use interpersonal and intrapersonal communication skills to interact effectively in social situations like interviews, group discussions, seminars etc.
6. Effective Citizenship: The students will be able to execute their duties and responsibilities as citizens successfully by being a part of larger community.
7. Ethics: The students will be able to perceive the complexities of human behavior and identity through various forms of literature. They will be able to develop a deeper understanding of human values such as morality, empathy, good will etc.

8. Environment and Sustainability: The students will become aware about the issues related to environment and the steps needed to be implemented for its sustainability through the study of texts with ecological elements and dimensions.
9. Self-directed and Life-long Learning: The students will be able to grasp excellent pieces of prose and poetry in English whereby each and every lesson will be a lesson in life- long learning.

Programme Specific Outcomes:

1. Students will be able to comprehend excellent pieces of prose and poetry in English literature.
2. Students will be able to understand the evolution of criticism and its application in language and literature.
3. Students will be able to apply knowledge of English language to improve skills in Listening, Speaking, Reading and Writing

F.Y.B.A. English (2019-20)

Course: Compulsory English

After successfully completing this course, students will be able to:

1. Recall parts of speech.
2. Identify various types of vocabulary.
3. Recognize the themes of each lesson.
4. Recite lines from poems.
5. Summarize a poem.
6. Describe various characters of a short story.
7. Apply the knowledge of language in day-to-day conversation.

Course: Additional English

After successfully completing this course, students will be able to:

1. Identify different genres of literature.
2. Interpret poems and discuss the literary devices used in the poems.
3. Evaluate short story as a genre of literature.
4. Analyse and criticise prose lessons.
5. Determine the elements of a one act play.
6. Define different functions of language as a means of communication.
7. Analyse the sound system of the English language.
8. Develop literary competence in students to help them derive pleasure by reading the prescribed texts.

F.Y.B.Com. English (2019-20)

Course: Compulsory English

After successfully completing this course, students will be able to:

1. The students are able to appreciate the literary beauty of the given prose and poetry.
2. The students are able to develop their communication skills.
3. The students are able to apply the critical appreciation to other similar poems.
4. The students are able to express their views on the given prose and poetry.
5. The students are able to relate the themes of the given prose and poetry to relevant contemporary issues.

F.Y.B.Com. English

Course: Additional English

After successfully completing this course, students will be able to:

1. The students are able to know a variety of topics that dominate contemporary socio economic and cultural life.
2. The students are able to express their opinions on the given topics.
3. The students are able to creatively debate and discuss the given topics.
4. The students develop oral and written communication skills.
5. The students develop overall linguistic competence.

M. A. English Part I (2019-20)

Programme Outcomes:

After successfully completing M.A. English Programme students will be able to:

1. Critical Thinking: Apply various important critical approaches and their canons to various texts. The students will be able to implement literary critical theories and discuss literary texts among their peers. They will be able to familiarize themselves with the glossary used in criticism.
2. Analytical Skills: The students will be able to analyse and evaluate different categories of literature such as short story, drama, poetry, fiction and non-fiction.
3. Effective Communication: The students will be able to develop oral and written communication skills in English. They will be able to enrich their vocabulary and its usage in communication. The students will be able to apply grammatical rules to day to day spoken and written language.
4. Social Interaction: The students will be able to use interpersonal and intrapersonal communication skills to interact effectively in social situations like interviews, group discussions, seminars etc.
5. Effective Citizenship: The students will be able to accomplish their duties and responsibilities as citizens successfully by being a part of larger community.
6. Ethics: The students will be able to identify the intricacies of human psyche through various themes and genres of literature. They will be able to develop a profound understanding of human values such as righteousness, morality, responsiveness, goodness etc.
7. Environment and Sustainability: The students will become aware about the issues related to environment and the steps needed to be implemented for its sustainability through the study of Eco-Critical texts.
8. Self-directed and Life-long Learning: The students will be able to grasp brilliant segments of prose and poetry in English whereby each and every unit will be a lesson in life- long learning.
9. Cognitive Skills: The students will be able to comprehend, learn, process and apply knowledge in day to day life.
10. Research Oriented Learning: Students will be able to demonstrate high-level aptitude in literary research.

Programme Specific Outcomes:

1. Students will be able to understand the evolution of criticism and its application in English literature.
2. Students will be able to comprehend excellent pieces of Indian Writing in English.
3. Students will be able to apply knowledge of English language to improve skills in Listening, Speaking, Reading and Writing.
4. Students will be able to explain different theoretical and practical aspects of language and literature teaching.

Course Outcomes:

Paper – 1: English Literature from 1550-1798

After successfully completing these course students will be able to:

1. Illustrate literary sensibility and emotional response to the literary texts and implant sense of appreciation of selected literary texts.
2. Demonstrate his/her artistic and innovative perspective through the study of renowned writers.
3. Associate with human concern through exposure to literary texts.
4. Convince literary and linguistic competence.
5. Discuss literary texts among peers.
6. Identify the diction of language.
7. Summarize the minor and major of forms literature.

Paper – 2: English Literature from 1798-2000

On completion of the Programme, the students will be able to:

This syllabus enables the students to know major movements and figures of English literature.

1. The course has cultivated interest in the minds of the students to read and evaluate the text.
2. This syllabus includes many women writers and indirectly it encourages girls to pursue their dreams.
3. Till now women writers were not given importance hence it gives students an opportunity to see their world and how writers differ from each other in their ideological positions.
4. This course cultivates interest in doing research.
5. It covers major literary periods like Romantic age, Victorian age and Modern age. This helps students to know more about the background of British literature.
6. This course provides a strong base for learners of literature.

Paper -3: Contemporary Studies in English Language

On completion of the Programme, the students will be able to:

1. Illustrate the role of language in communication skills.
2. Discuss the factors that influence use of grammar and vocabulary in spoken and written English.
3. Classify various sub-disciplines of linguistic.
4. Apply linguistic theories to the study of language.
5. Acquire knowledge of the structure of language through diverse critical and theoretical perspectives.

Paper—4: Literary Criticism and Theory

On completion of the Programme, the students will be able to:

1. Discuss the nature, function and relevance of literary criticism and theory.
2. Apply various important critical approaches and their tenets to literary texts.
3. Familiarize themselves with the concept of literary criticism.
4. Explain the evolution of criticism and its application in language and literature.
5. Develop literary competence in students to help them derive aesthetic pleasure from different genres of literature.
6. Apply social, political, economic and historical theories to varied texts.

History
Department Profile
DEPARTMENT OF HISTORY
AHMEDNAGAR COLLEGE, AHMEDNAGAR

In Criteria Two, NAAC Guidelines says the following:
Program Outcomes of General Higher Education Programs:-

Students of all undergraduate general degree programs at the time of graduation will be able to:

PO1. The student should be able to develop the inclusive approach for sustainable society including all weaker section of the society like differently abled people, dalit, tribals etc.. He should be able to accept the cultural diversity and should be able to mix up with them with liberal approach. **Anticipate, value and support diversity, differences,** Welcoming, caring, respectful for all section of the society. The student should equip with adequate skills to enable their full participation in the emerging social, economic and cultural environment.

PO2. Developing every aspect of analysis through critical thinking by studying various events of the past and present and applying the same in practical life. Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

PO3. Increase the ability to speak and discuss with confidently on the subject matter and developing effective communication. Speak, read, write and listen clearly in person and through electronic media, and make meaning of the world by connecting people, ideas, books, media and technology.

PO4.Elicit views of others, mediate disagreements and help reach conclusions in group settings.

PO5. Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.

PO6. Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

- PO7.** Understand the issues of environmental contexts and sustainable development.
- PO8.** Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes
- PO9.** The Student should be able to Assume responsibility demanded by Situation in day to day life.
- PO10.** The Student should be able to Develop the ability to not only recognize problems but also seek solutions for them.
- PO11.** The Student should be able to Learn to co-operate and work in conjunction with others.
- PO 12.** Preparing the students for further studies in their major by developing a broad knowledge base, foundational intellectual skills, and dispositions for lifelong learning.

Program Specific Outcomes

PSOs of B.A History

PSO1. To enable the students to develop Knowledge, Understanding, Critical thinking, Practical skills, Interests and Attitudes relating to historical matters.

PSO2. History aims at helping students to understand the present existing social, political, religious and economic conditions of the people, the development of the past & the religion, customs institutions, administration and so on.

PSO3. History thus helps students to understand the present day problems at regional, national and international level accurately and objectively. This understanding enables students to lead useful and efficient lives.

PSO4. To creates interest as well as affection for reading historical figures, characters, events and facts which are found necessary for solving the present problems effectively.

PSO5. The student would be able to acquire knowledge of various terms, concepts, events, ideals, problems personalities and principles related to the study of history.

PSOs of M.A History

PSO1. To enables students to analyze & weigh evidences and take right decisions, trains memory, reasoning, and presentation of facts systematically and successfully.

PSO2. **The student will be able to** develop the ability of critical and logical thinking, Identify the problems; Analyze the problems; Select relevant facts, principles etc., Establish relationships; Advance arguments in support of or against an issue; Draw inferences and conclusions; Verify the inferences; and Evaluates.

PSO3. Students' progress in learning history is demonstrated by their increasingly sophisticated ability to identify, apply, and reflect on historical concepts, structures, and processes & made significant progress in understanding both the substance of the past and the ideas (procedures and concepts) necessary to make sense of it.

PSO4. The student must be aware of historiography as a field of study in history, understand how historians use periodization and chronology, be capable of researching historical topics independently, using appropriate historical methodologies, be able to locate and analyze primary source materials

PSO5. The student must develop a breadth of historical knowledge that represents awareness of the diversity of Indian and world civilizations and culture.

Course Outcomes

Department of History

Programs offered

Sr . N o.	Program	Program Objectives	Program Specific Objectives
1	History	B.A History <ol style="list-style-type: none"> 1. To enable the students to develop Knowledge, Understanding, Critical thinking, Practical skills, Interests and Attitudes relating to historical matters. 2. History aims at helping students to understand the present existing social, political, religious and economic conditions of the people, the development of the past & the religion, customs institutions, administration and so on. 3. History thus helps students to understand the present day problems at regional, national and international level accurately and objectively. This understanding enables students to lead useful and efficient lives. 4. To creates interest as well as affection for reading historical figures, characters, events and facts which are found necessary for solving the present problems effectively. 5. The student would be able to acquires knowledge of various terms, concepts, events, ideals, problems personalities and principles related to the study of history. 	<p>1.To Introduce innovative study techniques in the study of History of <i>Maratha to make it value based, conceptual and thought</i> provocative. To introduce International elements in the study of Marathas to facilitate comparative analysis of this history. To highlight the importance of past in exploration of present context. To understand the Socio –economic, cultural and political background of 17th century Maharashtra. To increase the spirit of healthy Nationalism & Secularism among the student. To encourage student s to for competitive examinations. To promote interest in the discipline of History. Suggesting the Importance of References.</p> <p>2.The course is designed to help the student to know- History of freedom movement of India, aims, objectives problems and progress of Independent India. It aims at enabling the student to understand the processes of rise of modern India. The Course attempts to acquaint student with fundamental aspects of Modern Indian History. To explain the basic concepts/ concerns/ frame work of Indian History</p> <p>3. To Survey the sources of History of Ancient India. The Course intends to provide an Understanding of the social, economic, religious and institutional bases of Ancient India. The course will</p>

		<p>study such as agriculture, Industry, trade. To study the development of the concept of Nation- State background of political history. To study ancient Indian Art & Architecture</p> <p>4. The purpose of the course is to enable the students to study the history of modern Maharashtra .To highlight the ideas, institutions, forces and movements that contributes to the modern Maharashtra. To acquaint the students with various interpretative perspectives. To introduce the student to the regional history within a broad national framework.</p> <p>5. To help the student to know Modern World. To acquaint the student with the Socio-economic & Political developments in other countries. And understand the contemporary world in the light of its background History.</p> <p>2. To orient the students with political history of Modern World.</p> <p>3. To acquaint Students about the main developments in the Contemporary orld (To understand to important development in 20th century World.)</p> <p>4. Impart knowledge about world concepts.</p> <p>5. To enable students to understand the economic transition in World during the 20th Century.</p> <p>6. Become aware of the principles, forces, processes and problems of the recent times.</p> <p>7. To acquaint the students with growth of various political movements that haped the modern world.</p> <p>8. To highlight the rise and growth of nationalism as a movement in different parts of the world.</p> <p>6. 1.To orient students about how history is studied, written and understood.</p> <p>2. To explain methods and tools of data collection</p> <p>3. To understand the meaning of Evolution of Historiography.</p> <p>4. To study the Various Views of Historiography.</p>
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2	M.A History	<p>M.A History</p> <p>1. To enables students to analyze & weigh evidences and take right decisions, trains memory, reasoning, and presentation of facts systematically and successfully.</p> <p>2.The student will be able to develop the ability of critical and logical thinking, Identify the problems; Analyze the problems; Select relevant facts, principles etc., Establish relationships; Advance arguments in support of or against an issue; Draw inferences and conclusions; Verify the inferences; and Evaluates.</p> <p>3.Students' progress in learning history is demonstrated by their increasingly sophisticated ability to identify, apply, and reflect on historical concepts, structures, and processes & made significant progress in understanding both the substance of the past and the ideas</p>	<p>1. The paper is designed to provide adequate conceptual base, bring better understanding of history and its forces, help interrogate existing paradigms and challenge the updated, help in developing critique, help research in terms of formulating hypotheses and develop broad frames of interaction with other social sciences and attain certain level of interdisciplinary approach. The teaching methods, teaching tools and the available resource material catered the same objectives.</p> <p>2. The course intends to provide an understanding of the social, economic and institutional bases of Ancient India. It is based on the premise that an understanding of Ancient Indian history is crucial to understand Indian history as a whole.</p> <p>3. The purpose of the course is to study the administrative system of the Marathas in</p>

	<p>(procedures and concepts) necessary to make sense of it.</p> <p>4.The student must be aware of historiography as a field of study in history, understand how historians use periodization and chronology, be capable of researching historical topics independently, using appropriate historical methodologies, be able to locate and analyze primary source materials</p> <p>5.The student must develop a breadth of historical knowledge that represents awareness of the diversity of Indian and world civilizations and culture.</p>	<p>an analytical way, to acquaint the student with the nature of Maratha Polity, to understand basic components of the Maratha administrative structure, to enable the student to understand the basic concepts of the Maratha polity.</p> <p>4. To make the student aware of the background, scope and various trends in U.S.</p> <p>Foreign Policy with a view to interpreting and analysing it and examining its effect on world politics.</p> <p>5. The paper is designed to provide adequate conceptual base, bring better understanding of history and its forces, help interrogate existing paradigms and challenge the outdated, help in developing critique, help research in terms of formulating hypotheses and develop broad frames of interaction with other social sciences and attain certain level of Interdisciplinary approach.</p> <p>6. The course examines the nature of medieval Indian society, economy, state formations, and the main religious currents of the time. It is seen as a continuation of the course on ancient India. It is also seen to be crucial to an understanding of the nature of society, and the problems of the challenge to that society, through colonialism, at a later stage.</p> <p>7. The purpose of the course is to study socio-economic history of the Marathas in an analytical way, to acquaint the student with the components of social structure and their functions, to understand the relationship between religion, caste, customs, traditions, class in 17th and 18th century Maratha Society, to enable the student to understand aspects of economic life, to trace the determinants of changes in social</p>
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			<p>and economic life.</p> <p>8. The paper is designed to help understand the nature, structure and potential of Medieval Indian economy.</p> <p>9. The paper intends to examine Ancient and Medieval civilizations with a view to understand, reinterpret and present them in historical perspective; to enable the student to understand intellectual trends in the modern world; to enable the student to have a better understanding of Indian History in the World context.</p> <p>10. The course is designed to introduce the student to some of the issues that have been debated by historians and to introduce some perspectives with reference to Indian History</p> <p>11. To acquaint the student with structural and conceptual changes in Indian economy after coming of the British, to make them aware of the exploitative nature of the British rule, to help them understand the process of internalisation by Indians of new economic ideas, principles and practices</p> <p>12. The paper intends to make an in-depth study of various aspects of British administrative policies in India.</p> <p>13. The purpose of this course is to enable the student to study the history of 'Modern India' from an analytical perspective; to make the student aware of the multi-dimensionality of Modern India; to highlight the ideas, institutions, forces and movements that contributed to the shaping of Indian modernity; to acquaint the student with various interpretative perspectives; to help them in articulating their own ideas and views leading to research orientation</p> <p>14. The paper intends to make an in-depth study of various aspects of British administrative policies in India.</p> <p>15. The paper is seen as a prerequisite for understanding the concepts that are used in history, both of west Europe and India; to acquaint the student with the intellectual activity that played an important role in shaping events; the</p>
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		<p>transition from medieval to modern times.</p> <p>16. The paper is seen as a prerequisite for understanding the concepts that are used in history, both of west Europe and India; to acquaint the student with the intellectual activity that played an important role in shaping events; the transition from medieval to modern times.</p> <p>17. To acquaint the student with the post-World War II scenario and to enable them to understand contemporary world from the historical perspective.</p> <p>18. The course is designed to help the students to know Japanese history especially after the opening up of Japan; Japan's modernization and its impact; post World War II developments and Japan's role in world politics</p>
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Courses offered

Sr. No.	Course	Course Outcomes
1	History General Paper No. 1 FYBA (New Syllabus-2019-20) Total Credits: 03 Semester-I Early India: From Prehistory to the Age of the Mauryas	<p>The history of Early India is a crucial part of Indian history. It is a base for understanding the entire Indian history. The course is aimed at helping the student to understand the history of early India from the prehistoric times to the age of the Mauryas. It attempts to highlight the factors and forces behind the rise, growth and spread of civilization and culture of India along with the dynastic history. It also attempts to help the students to understand the contribution of Early Indians to polity, art, literature, philosophy, religion and science and technology. It also aims to foster the spirit of enquiry among the students by studying the major developments in early Indian history.</p>
2	M.A. History New Syllabus-(2019-2020) Semester I: Core Paper No. 1	<p>The paper is designed to provide adequate conceptual base, bring better understanding of history and its</p>

	Credits: 4 Course Title: HS:CC-1History: Theory and Method	forces, help interrogate existing paradigms and challenge the updated, help in developing critique, help research in terms of formulating hypotheses and develop broad frames of interaction with other social sciences and attain certain level of interdisciplinary approach.
3	Semester I: Core Paper No. 2 Credits: 4 Course Title: HS:CC-2 Evalution of Ideas and Institutions in Early India	The course intends to provide an understanding of the social, economic and institutional bases of Ancient India. It is based on the premise that an understanding of Ancient Indian history is crucial to understand Indian history as a whole.
4	Semester I: Core Paper No.3. Credits: 4 Course Title: HS:CC-3 Maratha Polity	The purpose of the course is study the administrative system of the Marathas in an analytical way, acquaint the student with the nature of Maratha Polity, understand basic components of the Maratha administrative structure, enable the student understand the basic concepts of the Maratha polity.
5	Semester I: Optional Paper No. 7 Credits: 4 Course Title: HS:EC-7: U.S.A.: From Isolation to Hegemony	To make the student aware of the background, scope and various trends in U.S. Foreign Policy with a view interpreting and analysing it and examining its effect on world politics.
6	Semester II: Core Paper No. 4 Credits: 4 Course Title: HS:CC-4: Approches to History	The paper is designed to make the student aware about the various approaches to the discipline of History. With its roots in Indian history, the paper provides a historical review of the salient approaches that have developed over the last few centuries. It is hoped that the student will become aware of the idea that the same set of historical source materials can be interpreted in different ways depending upon the approach one takes in studying them.

7	Semester II: Core Paper No. 5 Credits: 4 Course Title: HS:CC-5: Ideas and Institutions in Medieval India	<p>The course examines the nature of medieval Indian society, economy, state formations, and the main religious currents of the time. It is seen as a continuation of the course on ancient India. It is also seen to be crucial to an understanding of the nature of society, and the problems of the challenge to that society, through colonialism, at a later scale.</p>
8	Semester II: Core Paper No. 6 Credits: 4 Course Title: HS:CC-6: Socio-Economic History of the Marathas	<p>The purpose of the course is to study socio-economic history of the Marathas in an analytical way, to acquaint the student with the components of social structure and their functions, to understand the relationship between religion, caste, customs, traditions, class in 17th and 18th century Maratha Society, enable the student understand aspects of economic life, trace the determinants of changes in social and economic life.</p>
9	Semester II: Optional Paper No. 13. Credits: 4 Course Title: HS:CC-13: Economic History of Medieval India Objectives	<p>The paper is designed help student understand the nature, structure and potential of Medieval Indian economy.</p>
1	B.A History History General Paper No. 1 Chh. Shivaji and His Times (1630 – 1707) (2013 Pattern)	<p>Introduce innovative study techniques in the study of History of Maratha to make it value based, conceptual and thought provocative. Introduce International elements in the study of Marathas to facilitate comparative analysis of this history. highlight the importance of past in exploration of present context. understand the</p>

		<p>Socio –economic, cultural and political background of 17th century Maharashtra.</p> <p>increase the spirit of healthy Nationalism & Secularism among the student.</p> <p>encourage student s to for competitive examinations. promote interest in the discipline of History. Suggesting the Importance of References.</p>
2	S.Y.B.A. (History) Modern- India (1857-1950) General Paper 2	<p>The course is designed to help the student to know- History of freedom movement of India, aims, objectives problems and progress of Independent India. It aims at enabling the student understand the processes of rise of modern India. The Course attempts acquaint student with fundamental aspects of Modern Indian History. explain the basic concepts/ concerns/ frame work of Indian History</p>
3	S.Y.B.A. History Special Paper - I, Ancient India (3000 B.C. to 1206 AD)	<p>The Course intends to provide an Understanding of the social, economic, religious and institutional bases of Ancient India. The course will study such as agriculture, Industry, trade. study the development of the concept of Nation- State background of political history. Study ancient Indian Art & Architecture</p>
4	S.Y.B.A. (History, special Paper -II) From 2014-2015 History of Modern Maharashtra (1818 to 1960)	<p>The purpose of the course is to enable the students to study the history of modern Maharashtra .Highlight the ideas, institutions, forces and movements that contributes to the modern Maharashtra. Acquaint the students with various interpretative perspectives. Introduce the student to the regional history within a broad national framework.</p>
5	<u>T.Y.B.A.</u> G-3 = HISTORY OF THE WORLD IN 20TH CENTURY (1914-1992)	<p>1. Help the student to know Modern World. Acquaint the student with the Socio-economic & Political developments in other countries. And understand the contemporary world in the light of its background History.</p>

		<p>2. Orient the students with political history of Modern World.</p> <p>3. Acquaint Students about the main developments in the Contemporary world</p> <p>4. Impart knowledge about world concepts.</p> <p>5. Enable students to understand the economic transition in World during the 20th Century.</p> <p>6. Become aware of the principles, forces, processes and problems of the recent times.</p> <p>7. Acquaint the students with growth of various political movements that helped the modern world.</p> <p>8. Highlight the rise and growth of nationalism as a movement in different parts of the world.</p>
6.	T.Y.B.A INTRODUCTION TO HISTORY LEVEL: S3 (2013 Pattern)	<p>Orient students about how history is studied, written and understood.</p> <p>2.Explain methods and tools of data collection</p> <p>3. Understand the meaning of Evolution of Historiography.</p> <p>4. Study the Various Views of Historiography.</p> <p>5. Study the approaches to Historiography.</p> <p>6. Study the types of Indian Historiography.</p> <p>7. Describe importance of inter-disciplinary research.</p> <p>8. Introduce students to the basics of research.</p> <p>9. Acquaint the student with the recent research in History.</p> <p>10. Learn how to use sources in their presentation.</p>
7.	T.Y.B.A HISTORY OF USA (1914 – 1992) LEVEL: S4	<p>Acquaint Students about the rise and development of the USA as a world power.</p> <p>2. Acquaint Students about the main developments in the Contemporary World</p> <p>3. Comprehend the socio economic reforms in 1914 – 1992.</p>

		<p>4. Acquaint the students with the principles of foreign policy.</p> <p>5. Orient the students with political history of Europe.</p>
8	<p>M.A. History</p> <p>Semester I: Core Paper No. 1 Credits: 4 Course Title: History and its Theory (2013 Pattern)</p>	<p>The paper is designed to provide adequate conceptual base, bring better understanding of history and its forces, help interrogate existing paradigms and challenge the updated, help in developing critique, help research in terms of formulating hypotheses and develop broad frames of interaction with other social sciences and attain certain level of interdisciplinary approach. The teaching methods, teaching tools and the available resource material catered the same objectives.</p>
9	<p>Semester I: Core Paper No. 2 Credits: 4 Course Title: Evolution of Ideas and Institutions in Ancient India</p>	<p>The course intends to provide an understanding of the social, economic and institutional bases of Ancient India. It is based on the premise that an understanding of Ancient Indian history is crucial to understand Indian history as a whole.</p>
10	<p>Semester I: Core Paper No.3. Credits: 4 Course Title: Maratha Polity</p>	<p>The purpose of the course is study the administrative system of the Marathas in an analytical way, acquaint the student with the nature of Maratha Polity, understand basic components of the Maratha administrative structure, enable the student understand the basic concepts of the Maratha polity.</p>
11	<p>Semester I: Optional Paper No. 5 Credits: 4 Course Title: U.S.A.: From Isolation to Hegemony (1865-1989)</p>	<p>Make the student aware of the background, scope and various trends in U.S. Foreign Policy with a view interpreting and analysing it and examining its effect on world politics.</p>
12	<p>Semester II: Core Paper No. 4 Credits: 4 Course Title: History and its Practice</p>	<p>The paper is designed to provide adequate conceptual base, bring better</p>

		<p>understanding of history and its forces, help interrogate existing paradigms and challenge the outdated, help in developing critique, help research in terms of formulating hypotheses and develop broad frames of interaction with other social sciences and attain certain level of Interdisciplinary approach.</p>
13	<p>Semester II: Core Paper No. 5 Credits: 4 Course Title: Evolution of Ideas and Institutions in Medieval India</p>	<p>The course examines the nature of medieval Indian society, economy, state formations, and the main religious currents of the time. It is seen as a continuation of the course on ancient India. It is also seen to be crucial to an understanding of the nature of society, and the problems of the challenge to that society, through colonialism, at a later stage.</p>
14	<p>Semester II: Core Paper No. 6 Credits: 4 Course Title: Socio-Economic History of the Marathas</p>	<p>The purpose of the course is to study socio-economic history of the Marathas in an analytical way, to acquaint the student with the components of social structure and their functions, to understand the relationship between religion, caste, customs, traditions, class in 17th and 18th century Maratha Society, enable the student understand aspects of economic life, trace the determinants of changes in social and economic life.</p>
15	<p>Semester II: Optional Paper No. 9. Credits: 4 Course Title: Economic History of Medieval India</p> <p>Objectives</p>	<p>The paper is designed help student understand the nature, structure and potential of Medieval Indian economy.</p>

16	Semester III: Core Paper No. 7 Credits :4 Course Title: Ancient and Medieval Civilizations of the World	The paper intends examine Ancient and Medieval civilizations with a view understand, reinterpret and present them in historical perspective; to enable the student to understand intellectual trends in the modern world; to enable the student to have a better understanding of Indian History in the World context.
17	Semester III: Core Course No. 8. Credits :4 Course Title: Debates in Indian History	The course is designed introduce the student to some of the issues that that have been debated by historians and introduce some perspectives with reference to Indian History.
18	Semester III: Core Paper No. 9 Credits :4 Course Title: Economic History of Modern India	Acquaint the student with structural and conceptual changes in Indian economy after coming of the British, make them aware of the exploitative nature of the British rule, help them understand the process of internalisation by Indians of new economic ideas, principles and practices.
19	Semester III: Optional Paper No. 14 Credits :4 Course Title: British Administrative Policies in India, 1765-1892	The paper intends make an in-depth study of various aspects of British administrative policies in India.
20	Semester IV: Core Paper no. 10 Credits :4 History of Modern India (1857-1971)	The purpose of this course is to enable the student study the history of 'Modern India' from an analytical perspective; make the student aware of the multi-dimensionality of Modern India; highlight the ideas, institutions, forces and movements that contributed the shaping of Indian modernity; acquaint the student with various interpretative perspectives; help them in articulating their own ideas and views leading research orientation.

21	Semester IV: Core Paper no. 11 Credits : Course Title: Intellectual History of the Modern West	The paper is seen as a prerequisite for understanding the concepts that are used in history, both of west Europe and India; acquaint the student with the intellectual activity that played an important role in shaping events; the transition from medieval modern times.
22	Semester IV: Core Paper no. 12 Credits :4 Course Title: World after World War II (1945-2000)	Acquaint the student with the post-World War II scenario and to enable them understand contemporary world from the historical perspective.
23	Semester IV: Optional Paper No. 22. Credits :4 Course Title: East Asia : Japan, 1853-2000.	The course is designed help the students know Japanese history especially after the opening up of Japan; Japan's modernization and its impact; post World War II developments and Japan's role in world politics

Mathematics

Sr. No.	Program	Program Objectives	Program Specific Objectives
1	BSc Mathematics	<p>PO1: A student should be able to recall basic facts about mathematics and should be able to display knowledge of conventions such as notations, terminology and recognise basic geometrical figures and graphical displays , state important facts resulting from their studies.</p> <p>PO2: A student should get a relational understanding of mathematical concepts and concerned structures, and should be able to follow the patterns involved, mathematical reasoning.</p> <p>PO3: A student should get adequate exposure to global and local concerns that explore them many aspects of Mathematical Sciences.</p> <p>PO4: A student be able to apply their skills and knowledge ,that is, translate information presented verbally into mathematical form, select and use appropriate mathematical formulae or techniques in order to process the information and draw the relevant conclusion.</p> <p>PO5: A student should be made aware of history of mathematics and hence of its past, present and future role as part of our culture.</p>	<p>PSO1: To enable the students to cultivate a mathematical way of thinking i.e. making conjectures, verifying them with further observations, generalizing them, trying to find proofs and making observations.</p> <p>PSO2 : To enable the students to quantify their experiences in other subjects they study.</p> <p>PSO3: To enable the students to learn the basic structures of mathematics through unifying concepts and to motivate these structures through applications.</p> <p>PSO4: To enable the students to study mathematics for themselves.</p> <p>PSO5: To provide high quality mathematical education at all levels that will be vital for scientific and technological developments.</p> <p>PSO6: The mathematical maturity of students in their current and future courses shall develop.</p> <p>PSO7: The student develops theoretical, applied and computational skills.</p>

Attainment of Programme Specific Outcome

Courses Offered

Sr. No.	Course	Course Outcomes
1	FYBSc Algebra and Geometry	<p>On completion of this course students will be expected to</p> <ul style="list-style-type: none"> <input type="checkbox"/> Prove results involving divisibility and greatest common divisors; <input type="checkbox"/> Applications of Modular Arithmetics. <input type="checkbox"/> Solve systems of linear equations; <input type="checkbox"/> Find integral solutions to specified linear Diophantine Equations; <input type="checkbox"/> Apply Euler-Fermat's Theorem to prove relations involving prime numbers; <input type="checkbox"/> Apply the Wilson's theorem. <input type="checkbox"/> Polynomial addition, subtraction, division, multiplication, roots of polynomials. <input type="checkbox"/> Transformation, translation and reflection; <input type="checkbox"/> Used cut-out shapes as a means to develop the mental transformation of geometric shapes. <input type="checkbox"/> Perform translations and rotations of the coordinate axes to eliminate certain terms from equations. <input type="checkbox"/> To find nature of general conics. <input type="checkbox"/> Find equation of spheres, cylinders and cones from different given
2	FYBSc Calculus –I and Calculus –II	<p>On completion of this course students will be expected to</p> <ul style="list-style-type: none"> • Be able to solve algebraic equations and inequalities involving the square root and modulus function understand the difference between equations and identities, and be able to prove simple identities and inequalities • Be able to recognize odd, even, periodic, increasing, decreasing functions • Understand the operation of composition of functions . • Be able to calculate limits by substitution and by eliminating zero denominators • Be able to calculate limits at infinity of rational functions • Be able to calculate limits in indeterminate forms by a repeated use of L'Hopital's rule • Be able to use derivatives to find intervals on which the given function is increasing or decreasing • Find maxima and minima, critical points and inflection points of

		<p>functions and to determine the concavity of curves</p> <ul style="list-style-type: none"> • Be able to sketch graphs of rational functions. • Understand the concept of first order differential equations and its applications.
3	SYBSc (SemI) Multivariable Calculus I	<p>Upon successful completion of Multivariable Calculus the student will be able to:</p> <ul style="list-style-type: none"> • Perform standard operations on vectors in two-dimensional space and three-dimensional space • Compute the dot product of vectors, lengths of vectors, and angles between vectors • Compute the cross product of vectors and interpret it geometrically • Determine the equations of lines and planes using vectors • Identify various quadric surfaces through their equations • Sketch various types of surfaces • Define vector functions of one real variable and sketch space curves • Compute derivatives and integrals of vector functions • Find the arc lengths and curvatures of space curves • Find the velocity and acceleration of a particle moving along a space curve • Define functions of several variables and their limits • Calculate the partial derivatives of functions of several variables • Apply the chain rule for functions of several variables • Calculate the gradients and directional derivatives of functions of several variables • Solve problems involving tangent planes and normal lines • Determine the extrema of functions of several variables • Use the Lagrange multiplier method to find extrema of functions with constraints.
4	SYBSc (SemI) Laplace Transform and Fourier Series	<p>On completion of this unit successful students will:</p> <ul style="list-style-type: none"> • Able to understand the Laplace transform of elementary functions. • Able to use the rules of integration & definition of Laplace transform students to prove the properties of Laplace transform. • Learns the topics inverse Laplace transform, application of Laplace transform helps to solve linear higher order differential equation, system of differential equations. • Understand the concept of Fourier Series which gives the idea of expanding the sectionally continuous functions into infinite series.
5	SYBSc (SemII) Linear Algebra	<p>On successful completion of this course unit students will be able to</p> <ul style="list-style-type: none"> • Understand the basic ideas of vector algebra: linear dependence and independence and spanning; • Know how to find the row space, column space and null space of a matrix, and be familiar with the concepts of dimension of a subspace and the rank and nullity of a matrix, and to understand the relationship of these concepts to associated systems of linear equations;

		<ul style="list-style-type: none"> • Be familiar with the notion of a linear transformation and its matrix; • Find the Gram-Schmidt orthogonalization of a matrix
6	SYBSc (SemII) Multivariable Calculus II	<p>On completion of this unit successful students will be able :</p> <ul style="list-style-type: none"> • How to deal with vector valued functions • To understand topics like line integral ,surface integral which generalize integration to functions defined on curves & surfaces. • To understanding the computation of work done ,flux,mass,area of the surfaces. • To understand the Greens theorem , Stokes theorem ,divergence theorem that teaches the relation between integration of functions over surfaces & its boundary,solids & its surface
7	TYBSc (SemIII) Metric Spaces	<p>On completion of this unit successful students will be able to:</p> <ul style="list-style-type: none"> • Deal with various examples of metric spaces; • Have some familiarity with continuous maps; • Work with compact sets in Euclidean space; • Work with completeness; • Apply the ideas of metric spaces to other areas of mathematics.
8	TYBSc (SemIII) Real Analysis I	<p>By the end of the course, students will be able to:</p> <ul style="list-style-type: none"> • Explain the completeness of a system of real numbers: a least upper bound, a greatest lower bound. • Elaborate on the topological concepts of the real numbers: open sets, closed sets, accumulation points, closure, open covers, compact sets. • Define and utilize the following concepts: sequence, subsequence, monotone sequence, Cauchy sequence. • Prove that a given function is continuous or discontinuous and classify its points of discontinuity. • Justify the convergence/divergence of a given number series; • Prove some of the classical theorems of real analysis.
9	TYBSc (SemIII) Group Theory	<p>On completion of this unit successful students will be able to:</p> <ul style="list-style-type: none"> • Demonstrate when a binary algebraic structure forms a group. • Construct Cayley tables. • Determine possible subgroups of a group. • Identify normal subgroups of a group. • Examine symmetric and permutation groups. • Explain group and subgroup orders using Lagrange's theorem. • Identify cyclic subgroups and their generators. • Identify factor group.

		<ul style="list-style-type: none"> • Implement group axioms. • Apply a range of mathematical techniques to solve a variety of quantitative problems. • Analyze and solve problems individually and/or as par
10	TYBSc (SemIII) Ordinary Differential Equations	<p>On completion of this unit successful students will be able to:</p> <ul style="list-style-type: none"> • Distinguish between linear, nonlinear, partial and ordinary differential equations. • State the basic existence theorem for 1st order ODE's and use the theorem to determine a solution interval. • Recognize and solve a variable separable differential equation. 4. Recognize and solve a homogeneous differential equation. • Recognize and solve an exact differential equation. • Recognize and solve a linear differential equation by use of an integrating factor. • Make a change of variables to reduce a differential equation to a known form. • Find particular solutions to initial value problems. 10. Solve basic application problems described by first order differential equations.
11	TYBSc (SemIII) Operatio n Research	<p>On completion of this unit successful students will be able to:</p> <ul style="list-style-type: none"> • Apply the techniques used in operations research to solve real life problem in mining • Industry select an optimum solution with profit maximization; • Have complete understand of the significant role operation research play in mining • Project completion at every stage of the mines (Skills) use operations research to: <ol style="list-style-type: none"> 1. Solve transportation problems during the allocation of trucks to excavators 2. Formulate operation research models to solve real life problem 3. Proficiently allocating scarce resources to optimise and maximise profit 4. Eliminate customers / clients waiting period for service delivery turn real life problems into formulation of models to be solve by linear programming etc. • Determine critical path analysis to solve real life project scheduling time and timely • Delivery use critical path analysis and programming evaluation production and review techniques • For timely project scheduling and completion and conduct literature search on the internet in the use of operation research techniques in mining projects execution and completion.

12	TYBSc (SemIII) Number Theory	<p>On completion of this unit successful students will be able to:</p> <ul style="list-style-type: none"> • Define and interpret the concepts of divisibility, congruence, greatest common divisor, prime, and prime-factorization. • Apply the Law of Quadratic Reciprocity and other methods to classify numbers as primitive roots, quadratic residues, and quadratic non- residues. • Formulate and prove conjectures about numeric patterns. • Produce rigorous arguments (proofs) centered on the material of number theory, most notably in the use of Mathematical Induction and/or the Well Ordering Principal in the proof of theorems.
13	TYBSc (SemIV) Complex Analysis	<p>Upon successful completion Complex Analysis, a student will be able to:</p> <ul style="list-style-type: none"> • Represent complex numbers algebraically and geometrically, • Define and analyze limits and continuity for complex functions as well as consequences of continuity, • Apply the concept and consequences of analyticity and the Cauchy- Riemann equations and of results on harmonic and entire functions including the fundamental theorem of algebra, • Analyze sequences and series of analytic functions and types of convergence, • Evaluate complex contour integrals directly and by the fundamental theorem, apply the Cauchy integral theorem in its various versions, and the Cauchy integral formula, and • Represent functions as Taylor, power and Laurent series, classify singularities and poles, find residues and evaluate complex integrals using the residue theorem.
14	TYBSc (SemIV) Real Analysis II	<p>Upon successful completion of this course, students will be able to</p> <ul style="list-style-type: none"> <input type="checkbox"/> Define Riemann integrable and Riemann sums <input type="checkbox"/> Prove a theorem about Riemann sums and Riemann integrals <input type="checkbox"/> Knowledge of some simple techniques for testing the convergence of sequences and series of functions, and confidence in applying them.
15	TYBSc (SemIV) Ring Theory	<p>Upon successful completion of this course, students will be able</p> <ul style="list-style-type: none"> • To write precise and accurate mathematical objects in ring theory • For checking the irreducibility of higher degree polynomials over rings. • To understand the concepts like ideals and quotient rings. • To understand the concept of ring homomorphism.
16	TYBSc (SemIV)	<p>Upon successful completion of this course, students will be able to</p>

	Partial Differential Equations	<ul style="list-style-type: none"> • Explain the concepts and language of partial differential equations. • Understand the difference between ordinary & partial differential equation • Classify the partial differential equations • Solve the partial differential equation using charpits method, Jacobis method.
17	TYBSc (SemIV) Optimization Techniques	<p>Upon successful completion of this course, students will be able to</p> <ul style="list-style-type: none"> • Formulate optimization problems; • Understand and apply the concept of optimality criteria for various type of optimization problems; • Solve various constrained and unconstrained problems in single variable as well as multivariable; • Apply the methods of optimization in real life situation.
18	TYBSc (SemIV) Graph Theory	<p>Upon successful completion of this course, students should</p> <ul style="list-style-type: none"> • Be familiar with the definitions and basic theory of graphs; • Be able to implement many of the standard algorithms of graph theory; • Be able to prove simple results in graph theory. • State all of the technical definitions covered in the course (such as a graph, tree, planar graph, coloring, digraph, generating function, linear extension, and other terms). • State all of the relevant theorems covered in the course. • Use these definitions and theorems from memory to construct solutions to problems and/or • Dijkstra's algorithm to find a shortest path spanning tree in a graph or digraph.

2.6 Student Performance and Learning Outcomes

2.6.1 Program outcomes, program specific outcomes and course outcomes

Sr. No.	Program	Program Objectives	Program Specific Objectives
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1	MSc Mathematics	<p>PO1: To maintain updated curriculum.</p> <p>PO2: To take care of fast development in the knowledge of mathematics.</p> <p>PO3: To enhance the quality and standards of Mathematics Education.</p> <p>PO4: To provide a broad common framework, for exchange, mobility and free dialogue across the Indian Mathematical and associated community.</p> <p>PO5: To create and aptitude for Mathematics in those students who show a promise for higher studies and creative work in Mathematics.</p>	<p>PSO1: To produce research scholars who can provide the leadership in mathematics and its applications.</p> <p>PSO2: The student desiring to become a teacher should be exposed to historical aspects of development of some important concepts of mathematics and technique of teaching mathematics through problem seminars.</p> <p>PSO3: To create confidence in others, for equipping themselves with that part of Mathematics which is needed for various branches of Sciences or Humanities in which they have aptitude for higher studies and original work.</p>
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Courses Offered

Sr. No.	Course	Course Outcomes
1	MSc I (Sem II) Linear Algebra	<ul style="list-style-type: none"> • Upon successful completion of this course, students will be able : • Define and compute eigenvectors and eigenvalues. • Define a vector space and state its properties. • Compute the linear span of a set of vectors. • Determine the linear independence or dependence of a set of vectors. • Determine a basis of a vector space. • Explain the ideas of linear independence, spanning set, basis, and dimension. • Define and identify linear transformations. • Define and compute the characteristic polynomial of a matrix. • State the spectral theorem. • Define the notion of length for abstract vectors in abstract vector spaces. • Define and identify orthogonal vectors. • Define and identify orthogonal and orthonormal subsets of \mathbb{R}^n. • Perform range-nullspace decompositions. • Perform orthogonal decomposition of space. • Perform singular-value decomposition. • Diagonalizing systems with repeated eigenvalues, Algebraic and

		<p>geometric multiplicity of eigenvalues, Introduction to the Jordan form.</p> <ul style="list-style-type: none"> • Use the Gram-Schmidt process
2	M.Sc.I(Sem .I) Real Analysis	<p>Upon successful completion of this course, students will be able :</p> <ul style="list-style-type: none"> • Define notion of Lebesgue Outer Measure , σ- algebra of Lebesgue Measurable Sets , Outer and Inner Approximation of Lebesgue Measurable Sets , Countable Additivity , Continuity , Borel-Cantelli Lemma , Non-measurable Set, Cantor Set, Cantor-Lebesgue Function. • Define notion Lebesgue Measurable Functions ,Sequential Point wise Limits and Approximations by Simple Functions, Littlewood's Three Principles ,Egoroff's Theorem , Lusin's Theorem. • Define notion Continuity of Monotone Functions ,Lebesgue's Differentiation Theorem , Functions of Bounded Variation ,Jordan's Theorem, Absolutely Continuous Functions ,Integration of Derivatives,Differentiation of Indefinite Integral ,Fundamental theorem of calculus.
3	MSc I (Sem I) Group Theory	<p>A student who has studied and learned the material should be able to:</p> <ul style="list-style-type: none"> • Incorporate equivalence relations into group theoretic structures, particularly factor groups. • Determine subgroups and determine whether given subsets of a group are subgroups. • Use the Fundamental Theorem of Cyclic Groups to classify and determine subgroup structure of non-cyclic groups. • Construct and manipulate group homomorphisms and isomorphisms. • Recognize and interpret theorems to prove properties about specific algebraic structure. • Use the skills of proof by contradiction, proof by contraposition, proof of set equality, and proof using both forms mathematical induction. • Define and test a potential isomorphism for being well-defined, a homomorphism, one-to-one and onto. • Use definitions of one-to-one, onto, well-defined, homomorphism, isomorphism and others to characterize a given map. • Create factor groups using normal subgroups or the First Isomorphism Theorem and interpret elements of factor groups accurately. • Demonstrate understanding of permutations and symmetries in a group theoretic context—particularly the significance of Cayley's Theorem. <p>Recognize and use the Sylow Theorems to characterize certain finite groups.</p>

4	MSc I (Sem I) Advanced Calculus	<p>Upon successful completion of this course, students will be able to :</p> <ul style="list-style-type: none"> • Understand topics derivative of scalar fields & vector fields , Line integral , Multiple integral and Surface integral. • Compute the physical terms like work done , mass ,center of mass , and weight of the body. • Teach how to find the area & volume of objects of irregular shape. • Learns dealing with function of more than one variable.
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		<ul style="list-style-type: none"> • Use differentiation for multivariate functions to find relative extrema of the functions.
5	MSc I (Sem I) Ordinary Differential Equations	<p>After studying this course, Student should be able to:</p> <ul style="list-style-type: none"> • Find general solutions to first-order, second-order, and higher-order homogeneous and nonhomogeneous differential equations by manual and technology-based methods. • Identify and apply initial and boundary values to find particular solutions to first-order, second-order, and higher order homogeneous and non- homogeneous differential equations by manual and technology-based methods, and analyze and interpret the results. • Select and apply appropriate methods to solve differential equations; these methods will include, but are not limited to, undetermined

		<p>coefficients, variation of parameters, eigenvalues and eigenvectors, LaPlace and inverse LaPlace transforms.</p> <ul style="list-style-type: none"> • Select and apply series techniques to solve differential equations; these techniques will include but are not limited to Taylor series. • Select and apply numerical analysis techniques to solve differential equations; these techniques will include but are not limited to Euler, Improved Euler, and Runge-Kutta.
6	MSc I (Sem II) Complex Analysis	<p>On completion of this unit successful students will be able to:</p> <ul style="list-style-type: none"> • Understand the significance of differentiability for complex functions and be familiar with the Cauchy-Riemann equations; • Evaluate integrals along a path in the complex plane and understand the statement of Cauchy's Theorem; • Compute the Taylor and Laurent expansions of simple functions, determining the nature of the singularities and calculating residues; • Use the Cauchy Residue Theorem to evaluate integrals and sum series.
7	MSc I (Sem II) Topology	<p>On completion of this unit successful students will be able to:</p> <ul style="list-style-type: none"> • Understand terms, definitions and theorems related to topology. • Demonstrate knowledge and understanding of concepts such as connectedness and compactness. • Apply theoretical concepts in topology to understand real world applications. The aim of the course is to provide for the students an introduction to theory of metric and topological spaces with emphasis on those topics that are important to higher mathematics. • focus on the basic notions of metric and topological spaces, properties of continuous mappings selected types of topological spaces (compact and connected spaces) and basic theorems on topological spaces.
8	MSc I (Sem II) Rings and Modules	<p>Upon successful completion of this course, students will be able</p> <ul style="list-style-type: none"> • To write precise and accurate mathematical objects in ring theory • For checking the irreducibility of higher degree polynomials over rings. • To understand the concepts like ideals and quotient rings. • To understand the generalization of vector spaces over fields to modules over rings • To write about ring theory in a coherent , grammatically correct and technically accurate manner.
9	MSc I (Sem II) Advanced Numerical Analysis	<p>After studying this course, Student should be able to:</p> <ul style="list-style-type: none"> • Effectively express the concepts and results of Number Theory. • Construct mathematical proofs of statements and find counterexamples to false statements in Number Theory. • Collect and use numerical data to form conjectures about the integers. • Understand the logic and methods behind the major proofs in Number Theory. <p>Work effectively as part of a group to solve challenging problems in Number Theory..</p>

10	MSc I (Sem II) Partial Differential Equations	<p>Upon successful completion of this course, students will be able to :</p> <ul style="list-style-type: none"> • Explain clearly concepts and theory of basic methods for solving partial differential equations. • Recognize the types of second-order partial differential equations as typified by classical equations of mathematical physics, such as the wave equation, heat-diffusion equation and Laplace equation. • Apply eigenfunction expansion methods to solve nonhomogeneous versions of heat-diffusion and wave equations. • Recognize the concept of a Green function and its applications in solving non-homogeneous problems and elementary boundary value problems • Create and formulate mathematical models for a range of scientific and engineering problems involving partial differential equations.
11	MSc II (Sem III) Combinatorics	<p>Upon successful completion of this course :</p> <ul style="list-style-type: none"> • It increases the logical thinking of the students. • It teaches how to reason and model combinatorically. • Students are able to use generating functions to solve a variety of combinatorial problems • Students are able to use addition and multiplication principle. • Students can understand the logical structure of programmes. • It develops proficiency in solving discrete math problems
12	MSc II (Sem III) Field Theory	<p>Upon successful completion of this course, students will be able to :</p> <ul style="list-style-type: none"> • Understand the fundamental concepts of field extensions and Galois theory and their role in modern mathematics and applied contexts • Understand accurate and efficient use of field extensions and Galois theory • Understand capacity for mathematical reasoning through analyzing, proving and explaining concepts from field extensions and Galois theory. • Apply problem- insightful solutions to several classical problems, of

		<p>which the most notable is the <i>problem of solvability by radicals</i>: which polynomial equation in one variable can be solved by means of radicals, i.e. via root extraction in addition to the usual rational operations of addition, subtraction, multiplication and division?</p> <ul style="list-style-type: none"> • Understand why geometric constructions: squaring a circle, doubling a cube and trisecting angle are impossible by using compass and scale.
13	MSc II (Sem III) Functional Analysis	<ul style="list-style-type: none"> • Students will appreciate the role of completeness through the Baire category theorem and its consequences for operators on Banach spaces. • They will have a demonstrable knowledge of the properties of a Hilbert space, including orthogonal complements, orthonormal sets, complete orthonormal sets together with related identities and inequalities. • They will be familiar with the theory of linear operators on a Hilbert space, including adjoint operators, self-adjoint and unitary operators with their spectra. • They will know the L^2-theory of Fourier series and be aware of the classical theory of Fourier series and other orthogonal expansions. • Understanding meaning and relations between main terms of measure and integral theory as well of functional analysis, formulating and proving of statements. • Identification of a problem and, using functional relations between objects of algebra, mathematical analysis, probability theory, geometry, complex-variable functions and so one, as well applying various methods from such branches, solution this problem.
14	MSc II (Sem III) Graph Theory	<p>The students who succeeded in this course;</p> <ul style="list-style-type: none"> • Algorithms to find the components of a graph and the strongly connected components of a digraph. • Algorithms to construct breadth first search and depth first search spanning trees of a connected graph. • The algorithms of Prim and Kruskal to find a minimum weight spanning tree in a connected graph. • Morav'ek's algorithm to find a longest path spanning tree in an acyclic directed network. • The max flow/min cut algorithm for finding a maximum (s,t)-flow in a network. • Algorithms for finding a maximum matching and a maximum weight matching in a bipartite graph. • Algorithms for finding an Euler trail in a graph or digraph and for solving the Chinese Postman Problem.
15	MSc II (Sem III) Applied Mathematics (Linear Integral	<p>The students who succeeded in this course;</p> <ul style="list-style-type: none"> • Will be able to classify integral equations. • Will be able to apply functional analytic methods on operators and integral equations.

	Equations)	<ul style="list-style-type: none"> <input type="checkbox"/> Will be able to describe definitions and relations in the theory of integral equations. <input type="checkbox"/> Will be able to analyse the methods such as integral transforms, Green's function, the concept of resolvent, uniqueness theorems, Fredholm theory. <input type="checkbox"/> Will be able to apply the theory of integral equations to other disciplines like applied mathematics, science and engineering.
16	MSc II (Sem IV) Number Theory	<p>Upon successful completion of this course, students :</p> <ul style="list-style-type: none"> • Effectively express the concepts and results of Number Theory. • Construct mathematical proofs of statements and find counterexamples to false statements in Number Theory. • Collect and use numerical data to form conjectures about the integers. • Understand the logic and methods behind the major proofs in Number Theory. • Work effectively as part of a group to solve challenging problems in Number Theory
17	MSc II (Sem IV) Differential Geometry	<p>Upon successful completion of this course, students :</p> <ul style="list-style-type: none"> • Will have the knowledge and skills to explain the concepts and language of differential geometry and its role in modern mathematics • Can apply differential geometry techniques to specific research problems in mathematics or other fields • Will be able to compute quantities of geometric interest such as integral curves, geodesics, orientation . • Can understand the topic curvature which helps student for understanding the shape of curve and surfaces. • Can understand the concept of parallel transport of vectors.
18	MSc II (Sem IV) Fourier Analysis and Boundary Value Problems	<p>Upon successful completion of this course, students will be able :</p> <ul style="list-style-type: none"> • To understand the Fourier series representation of periodic functions. • To provide standard method for solving differential equations. • To demonstrate how differential equation can be useful in many types of problems likes heat equations ,wave equations. • To understand how the wave and diffusion partial differential equations can be used to model certain systems. • To determine appropriate simple boundary and initial conditions for such models.
19	MSc II (Sem IV) Lattice Theory	<p>Upon successful completion of this course, students will be able :</p> <ul style="list-style-type: none"> • Recognize lattices, complete ordered sets and their varieties, • Know the standard tools of lattice theory, • Know the main representation theorems of lattices,, • To make use all the above both inside the theory and applications.
20	MSc II (Sem IV) Applied Mathematics (Coding Theory)	<p>Upon successful completion of this course :</p> <ul style="list-style-type: none"> • Knowledge. The student has knowledge of properties of and algorithms for coding and decoding of linear block codes, cyclic codes and convolution codes. The student has an overview of arithmetic in finite

		<p>fields, linear algebra over finite fields, and rings of power series.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Skills. The student masters arithmetic in finite fields and linear algebra over finite fields. The student is able to apply various algorithms and techniques for coding and decoding. <input type="checkbox"/> Understand and explain the basic concepts of information theory, source coding, channel and channel capacity, channel coding and relation among them. <input type="checkbox"/> Describe the real life applications based on the fundamental theory. <input type="checkbox"/> Calculate entropy, channel capacity, bit error rate, code rate, steady- state probability and so on.
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Program Specific Outcomes

Microbiology is a branch of science that studies “Life” taking an example of microorganisms such as bacteria, protozoa, algae, fungi, bacteria, viruses, etc. These studies integrate cytology, physiology, ecology, genetics and molecular biology, evolution, taxonomy and systematics with a focus on microorganisms; in particular bacteria. The relevance and applications of these microorganisms to the surrounding environment including human life and Mother Nature becomes part of this branch. Since inception of this branch of science, Microbiology has remained a field of actively research and ever expanding in all possible directions; broadly categorized as pure and applied science. Different branches of Pure Microbiology based on taxonomy are Bacteriology, Mycology, Protozoology and Parasitology, Phycology and Virology; with considerable overlap between these specific branches over each other and also with other disciplines of life sciences, like Biochemistry, Botany, Zoology, Cell Biology, Biotechnology, Nanotechnology, Bioinformatics, etc. Areas in the applied Microbial Sciences can be identified as: Medical, Pharmaceutical, Industrial (Fermentation, Pollution Control), Air, Water, Food and Dairy, Agriculture (Plant Pathology and Soil Microbiology), Veterinary, Environmental (Ecology, Geomicrobiology); and the technological aspects of these areas.

Department of Microbiology offers BSc Microbiology and MSc Microbiology

Programme specific outcomes for BSc and MSc Microbiology are as follows

Sr. No.	Program	Program Objectives	Program Specific Objectives
1	BSc Microbiology	<p>PO 1: Knowledge of different aspects of Microbiology has become crucial and indispensable to everyone in the society. Study of microbes has become an integral part of education and human progress. Building a foundation and a sound knowledge-base of Microbiological principles among the future citizens of the country will lead to an educated, intellectual and scientifically advanced society.</p> <p>PO 2: Microbiological tools have been extensively used to study different life processes and are cutting edge technologies. There is a continual demand for microbiologists in the work force – education, industry and research. Career opportunities for the graduate students are available in manufacturing industry and research institutes at technical level.</p>	<p>FYBSc: Students will be given the basic information that includes- Introduction of microbiological world, Classification of microorganisms, Techniques of Microscopy, isolation, observation of morphology.</p> <p>SYBSc: Students will be given the necessary information about Medical Microbiology and Immunology, Physiology and genetics of microorganisms, and applied microbiology.</p> <p>TYBSc: Students will be dealt with broad applied areas of microbiology that are interactive with higher living forms. Five such areas are – medical microbiology, microbial</p>

			<p>physiology, microbial (prokaryotic and eukaryotic) genetics, immunology and immunopathology, fermentation technology. The sixth course will be Applied Microbiology that will include – Dairy Microbiology, Food Microbiology, Fermentation Technology, Agriculture Biotechnology, Fungal Biotechnology.</p> <p>Over all objectives are</p> <p>To enrich students' knowledge and train them in the pure microbial sciences</p> <p>To introduce the concepts of application and research in Microbiology.</p> <p>To inculcate sense of scientific responsibilities and social and environment awareness.</p> <p>To help students build-up a progressive and successful career.</p>
2	MSc Microbiology	<p>PO 1:Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.</p> <p>PO 2: Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.</p> <p>PO 3: Problem Solving Approach: Develop the ability to not only</p>	<p>Current thrust area and prospectives in Microbiology are</p> <p>Microbial taxonomy and diversity</p> <p>Human health, agriculture, Microbial technology, Eukaryotic cellular organization,</p> <p>Eukaryotic gene expression e.g. yeast genetics,</p> <p>Determinants of microbial pathogenicity,</p>

		<p>recognize problems but also seek solutions for them.</p> <p>PO 4: Research Aptitude: students should be well acquainted with research methodology which includes different skill developments in scientific writing, data handling and processing, development of research ideas and planning / designing of research projects. The skill sets thus evolved will help the students in academic and applied research.</p>	<p>Immunopathology, immunopharmacology and cancer biology Protein stability, conformation and folding, □ Over-expression of recombinant proteins Biocontrol Bioinformatics Molecular tools for characterization, identification of bacteria, Possible utilization of microbial population from extreme environments</p> <p>Objectives to be achieved: To enrich students' knowledge and train them in the pure microbial sciences To introduce the concepts of application and research in Microbiology To inculcate sense of scientific responsibilities and social and environment awareness To help students build-up a progressive and successful career</p>
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Courses offered and their learning outcomes.

Sr. No.	Course	Course Outcomes
FYBSc		
1	FYBSc Paper I: Introduction to Microbiology	CO 1: Students will be able to define Microbiology and Microorganisms. CO 2: They will be able to identify different types of microorganisms. CO 3: They will be able to describe the importance and applications of microbiology CO 4: They will be able to memorise and recite the names of microorganisms with genus and species.
2	FYBSc Paper II: Basic techniques in Microbiology	CO 1: Students will be able to define and state the principles various techniques in microbiology. CO 2: They will be able to describe individual technique in detail. CO 3: Students will be able to name and list the growth requirements of micro-organisms.
3	FYBSc Practicals	CO 1: Students will be trained to techniques in microbiology like staining, cultivation of microorganisms CO 2: They will be able to label the different parts of instruments like incubator, Microscope, Autoclave etc. They will be able to identify types of microorganisms with the help of microscope.
SYBSc		

1	MB211: Medical Microbiology and Immunology	<p>CO 1: Students will be able to summarise the important pathogen and their pathogenic action and also able to understand basic terminologies in medical pathology.</p> <p>CO 2: They will be able to defend the importance of Epidemiology.</p> <p>CO 3: They will be able to distinguish between the specific and non-specific immune response.</p> <p>CO 4: They will be able to enlist various parts of immune system and their role in immune mechanism</p> <p>CO 5: Students will be able to elaborate the role of antibodies in defence mechanism.</p>
2	MB 212: Industrial Microbiology and Soil physiology	<p>CO 1: Students will be able to restate the importance of microorganisms in Industry.</p> <p>CO 2: They will be able to give examples of industrially important micro-organisms and their applications.</p> <p>CO 3: They will be able to explain process of Fermentation.</p> <p>CO 4: They will be able to distinguish between the types of fermentations.</p> <p>CO 5: They will be able to illustrate and label different parts of fermenters.</p> <p>CO 6: They will be able to distinguish between different classes of enzymes and give examples of of each class.</p> <p>CO 7: Students will be able to illustrate and explains the metabolic pathways.</p> <p>CO 8: They will be able to paraphrase the term oxidative and substrate level phosphorylation.</p>
3	MB 221: Bacterial Genetics	<p>CO 1: Students will be able to summarise the development of genetics.</p> <p>CO 2: They will be able to paraphrase the concept of gene.</p> <p>CO 3: They will be able to interpret the central dogma of molecular biology</p> <p>CO 4: They will be able to explain the cellular processes like DNA replication, transcription and translation.</p> <p>CO 5: They will be able to inter relate the cause of adaptation, evolution and cancer with the change in genetic inheritance.</p>
4	MB 222: Air, water and soil Microbiology	<p>CO 1: Students will be able to explain both air and water microflora.</p> <p>CO 2: They will be able to distinguish between air water microflora.</p> <p>CO 3: They will be able to summarise different techniques to measure the air and water microflora and interpret the results.</p> <p>CO 4: They will be able to summarise the role of microorganisms in agriculture.</p>

		CO 5: They will be able to inter relate the microorganisms and elemental cycles in nature.
5	MB 213 and MB223: Practical course	CO 1: Practical for the second year students will be less defined i.e. kept more flexible, designed to evolve project themes on environment, agriculture and pollution aspects and acquiring laboratory related skills. Practical at this level will also include application of biostatistics principles and computers for data analysis and interpretation, and introduction to scientific writing and report preparation. These aspects can be practiced better while carrying out the mini-projects.
TYBSc		
1	MB 331 and 341: Medical Microbiology	CO 1: Students will be able to organize diseases with respect to system. CO 2: They will be able to categories disease causing organisms like bacterial, fungal, viral etc. CO 3: They will be able to match diseases and their causative agents CO 4: They will able to understand the role antibiotics in the irradiation of disease and resistance generate against them.
2	MB 332 and 342: Genetics and Molecular Biology	CO 1: Students will be able to extend their study from prokaryotic gene expression to eukaryotic gene expression. CO 2: They will be able to describe and interpret various techniques of gene mapping and able to solve problems based on it. CO 3: Students will be able to define recombinant DNA technology (RDT) and state their applications. Students will be able to explain the various steps in RDT.
3	MB 333 and 343: Enzymology and Metabolism	CO 1: Students will be able to extend their study in enzymology with respect to identification and purification of enzyme. CO 2: They will be able to describe and generalize the role of co enzyme in enzyme catalysis. CO 3: Students will be able to interrelate between anabolism and catabolism. CO 4: Students will be able to elaborate their study about bioenergetics.
4	MB 334 and 344: Immunology	CO 1: students will be able to define the term immunology. CO 2: They will be able to list out components of immune system and describe them in detail. CO 3: They will be able to distinguish between humoral and cell specific immunity and innate and adaptive immunity.
5	MB 335 and 345: Fermentation technology	CO 1: Students will be able to define fermentation. CO 2: They will be able to describe process of industrial fermentation.

		<p>CO 3: They will be able to understand the role of bioreactor in fermentation.</p> <p>Co 4: They will be able to explain industrial processes for various products by flow sheet diagram.</p>
6	MB 336 and 346: Applied Microbiology	<p>CO 1: Students will be able to define and analyse the role microorganisms in dairy, food, and environment.</p> <p>CO 2: They will be able to explain milk and food spoilage due to micro-organisms.</p> <p>CO 3: They will be able to describe and apply process of food preservation.</p>
7	MB 347: Applied Microbiology (Practical course I)	CO 1: Students will be trained with various techniques carried out in industries like fermentation, food and dairy.
8	MB 348: Biochemistry and molecular biology (Practical course II)	CO 1: Students will be trained in various biochemical techniques like chromatography, centrifugation, qualitative and quantitative analysis of biochemical biomolecules.
9	MB 349: Clinical Microbiology (Practical course III)	CO 1: Students will be trained with various techniques in clinical Microbiology like isolation and identification of pathogen by classical and serological methods.

Course outcomes in MSc

No	Course	Learning outcomes
1	MSc I	<p>LO 1: Students will be able to describe classification scheme of microorganisms.</p> <p>LO2: They will be able to explain various methods of bacterial systematics like biochemical, molecular and bioinformatics.</p> <p>LO 3: Students will be able to apply statistical tools like central tendency, dispersion, correlation, regression and able to set up hypothesis for experiments and research.</p> <p>LO 4: Students will be able to use mathematical models to explain the laws of living system.</p> <p>LO 5: Students will be able to analyse the role of various biomolecules in living system, interaction of biomolecules in various processes.</p> <p>LO 6: Students are able to explain principles of various instruments used to understand living system.</p> <p>LO 7: They will be able to explain nature, structure, classification, detection methods and life cycle of viruses.</p>
2	MSc II	<p>LO 1: Students will able to analyse antigen antibody interactions and able to demonstrate various in vivo in vitro techniques of immunology.</p> <p>LO 2: They will be able to understand techniques of gene manipulation and able to design experiments based on it.</p> <p>LO 3: They will be able to explain various waste water treatment processes and analyze their role in environmental cleanup.</p>

		<p>LO 4: They will be able to hypothesize a problem and will be able to design experiment to test the hypothesis.</p> <p>LO 5: They will be able to explain nature, structure, classification, detection methods and life cycle of viruses.</p> <p>LO 6: They will be able to carry out a mini project.</p>
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Physics

Program Offered

Sr. No.	Program	Program Objectives	Program Specific Outcomes
1	B. Sc. Physics CBCS	<p>1) To foster scientific attitude, provide in-depth knowledge of scientific and technological concepts of Physics.</p> <p>2) To enrich knowledge through problem solving, minor/major projects, seminars, tutorials, review of research articles/papers, participation in scientific events, study visits, etc.</p> <p>3) To familiarize with recent scientific and technological developments.</p> <p>4) To create foundation for research and development in Physics.</p> <p>5) To help students to learn various experimental and computational tools thereby developing analytical abilities to address real world problems.</p> <p>6) To train students in skills related to research, education, industry, and market.</p> <p>7) To help students to build-up a progressive and successful career in Physics.</p>	<p>6. After completion of program, students will be able to have in-depth knowledge of basic concepts in Physics.</p> <p>7. Students will be able to apply the laws of Physics in real life situations to solve the problems.</p> <p>8. Students develop aptitude of doing research through undertaking small projects.</p> <p>9. Student will have set his foundation to pursue higher education in Physics.</p> <p>10. After completing the program student will have developed interdisciplinary approach and can pursue higher studies in subjects other than Physics</p> <p>11. Ability Enhancement</p>

Courses Offered: (Executed last year: F.Y.B. Sc. CBCS Physics)

Sr. No.	Course	Course Outcome
F. Y. B. Sc.		
Semester 1	1. Mechanics PHY-111 Credit 2	<ol style="list-style-type: none"> 1. Demonstrate an understanding of Newton's laws and applying them in calculations of the motion of simple systems. 2. Use the free body diagrams to analyse the forces on the object. 3. Understand the concepts of energy, work, power, the concepts of conservation of energy and be able to perform calculations using them. 4. Understand the concepts of elasticity and be able to perform calculations using them. 5. Understand the concepts of surface tension and viscosity and be able to perform calculations using them. 6. Use of Bernoulli's theorem in real life problems. 7. Demonstrate quantitative problem solving skills in all the topics covered.
	2. Physics Principles and Applications PHY-112 Credit 2	<p>On successful completion of this course students will be able to do the following:</p> <ol style="list-style-type: none"> 1. To understand the general structure of atom, spectrum of hydrogen atom. 2. To understand the atomic excitation and LASER principles. 3. To understand the bonding mechanism and its different types. 4. To demonstrate an understanding of electromagnetic waves and its spectrum. 5. Understand the types and sources of electromagnetic waves and applications. 6. To demonstrate quantitative problem solving skills in all the topics covered.
	3. Physics Laboratory-IA PHY-113 Credit 1.5	<ol style="list-style-type: none"> 1. Acquire technical and manipulative skills in using laboratory equipment, tools, and materials. 2. Demonstrate an ability to collect data through observation and/or experimentation and interpreting data. 3. Demonstrate an understanding of laboratory procedures including safety, and scientific methods. 4. Demonstrate a deeper understanding of abstract concepts and theories gained by experiencing and visualizing them as authentic phenomena. 5. Acquire the complementary skills of collaborative learning and teamwork in laboratory settings.

Semester 2	1. Heat and Thermodynamics PHY-121 Credit 2	<ol style="list-style-type: none"> 1. Describe the properties of and relationships between the thermodynamic properties of a pure substance. 2. Describe the ideal gas equation and its limitations. 3. Describe the real gas equation. 4. Apply the laws of thermodynamics to formulate the relations necessary to analyze a thermodynamic process. 5. Analyze the heat engines and calculate thermal efficiency. 6. Analyze the refrigerators, heat pumps and calculate coefficient of performance. 7. Understand property 'entropy' and derive some thermodynamical relations using entropy concept. 8. Understand the types of thermometers and their usage.
	2. Electromagnetic PHY-122 Credit 2	<p>On successful completion of this course students will be able to do the following:</p> <ol style="list-style-type: none"> 1) To understand the concept of the electric force, electric field and electric potential for stationary charges. 2) Able to calculate electrostatic field and potential of charge distributions using Coulomb's law and Gauss's law. 3) To understand the dielectric phenomenon and effect of electric field on dielectric. 4) To Study magnetic field for steady currents using Biot-Savart and Ampere's Circuital laws. 5) To study magnetic materials and its properties. 6) Demonstrate quantitative problem solving skills in all the topics covered.
	3. Physics Laboratory-IB PHY-123 Credit 1.5	<ol style="list-style-type: none"> 1. Acquire technical and manipulative skills in using laboratory equipment, tools, and materials. 2. Demonstrate an ability to collect data through observation and/or experimentation and interpreting data. 3. Demonstrate an understanding of laboratory procedures including safety, and scientific methods. 4. Demonstrate a deeper understanding of abstract concepts and theories gained by experiencing and visualizing them as authentic phenomena. 5. Acquire the complementary skills of collaborative learning and teamwork in laboratory settings.

S. Y. B. Sc.

	Mathematical Methods in Physics I	<p>After the completion of this course students will be able to</p> <ol style="list-style-type: none"> 1. Understand the complex algebra useful in physics courses 2. Understand the concept of partial differentiation. 3. Understand the role of partial differential equations in physics 4. Understand vector algebra useful in mathematics and physics 5. Understand the singular points of differential equation.
	Electronics I	<p>Students gain theoretical concepts of the electronic circuit design, instrumentations, and practical work along with hands-on experiences of the practical work.</p>

	Oscillations, Waves and Sound	<ol style="list-style-type: none"> 1. Solve the equations of motion for simple harmonic, damped, and forced oscillators. 2. Understand the physics and mathematics of oscillations. 3. Formulate these equations and understand their physical content in a variety of applications, 4. Describe oscillatory motion with graphs and equations, and use these descriptions to solve problems of oscillatory motion. 5. Explain oscillation in terms of energy exchange, giving various examples. 6. Solve problems relating to undamped, damped and force oscillators and superposition of oscillations. 7. Understand the mathematical description of travelling and standing waves. 8. Recognise the one-dimensional classical wave equation and solutions to it. 9. Calculate the phase velocity of a travelling wave. 10. Explain the Doppler effect, and predict in qualitative terms the frequency change that will occur for a stationary and a moving observer. 11. Define the decibel scale qualitatively, and give examples of sounds at various levels. 12. Explain in qualitative terms how frequency, amplitude, and wave shape affect. 13. The pitch, intensity, and quality of tones produced by musical instruments.
	Optics	Students understands different theoretical concepts of optics such as interference, polarization, diffraction etc. and are able to analyze the examples based on these concepts.
	Practical	Whatever the students learned in their theory courses such as, electronics, waves, oscillations and sound and optics. They need to verify these concept. This course will help to student to verify the concept from theory.
T. Y. B.Sc.		
	Mathematical Methods in Physics II	<p>There are following four modules in this course:</p> <ol style="list-style-type: none"> 1. Curvilinear Co-ordinates 2. The Special Theory of Relativity 3. Differential equations 4. Special functions <p>This course acts as a foundation for other courses taught in Physics. Under this course the basic and advanced mathematical background required for other courses such as; classical mechanics, quantum mechanics, statistical physics, electrodynamics etc. are taught to the students. After successfully completing this course students get thorough knowledge of basics of curvilinear co-ordinate system, differential equations, special functions and special theory of relativity.</p>

	Classical Electrodynamics	<p>After completion of course students should</p> <ol style="list-style-type: none"> 1. Be able to use method of images in electrostatics to solve the boundary value problems. 2. Should have understood the basic laws in magneto statics like Biot-Savart's law, Ampere's law etc. 3. have understood the concept of magnetic vector potential. 4. Have understood Maxwell's laws of electrodynamics. 5. Be able to solve Maxwell's equations in free space and write equation of plane e-m waves.
	Solid State Physics	<p>After completion of course students should</p> <ol style="list-style-type: none"> 1. Have deep understanding of various types of crystal structures and should have understood the concept of reciprocal lattice. 2. Have clear idea of various characterization techniques like x-ray diffraction, UV-visible spectroscopy, SEM, TGA etc. 3. Have understood the free electron model, band formation and origin of band gap. 4. Be able to understand the theory of magnetism and phenomena like superconductivity.
	Quantum Mechanics	<p>Quantum Mechanics course is a foundation course. In this course, student will learn the historical aspects of development of quantum mechanics, understand and explain the differences between classical and quantum mechanics, understand the idea of wave function and the uncertainty relations, solve Schrodinger equation for simple potentials. Also, students will gain a basic understanding of the formalism and 'language' of quantum mechanics especially commutation brackets, various quantum mechanical operators.</p>
	Classical Mechanics	<p>The course aims to develop an understanding of Lagrangian and Hamiltonian formulation which allow for simplified treatments of many complex problems in classical mechanics and provides the foundation for the modern understanding of dynamics.</p> <p>At the end of the course, students will have thorough knowledge and problem solving skills related to the Classical mechanics T.Y. B.Sc. Syllabus topics.</p> <p>Internal class test I</p> <p>Home Assignment (Book Problem solving)</p> <p>Internal class test II</p>
	Thermodynamics and Statistical Physics	<ol style="list-style-type: none"> 1. Upon completion of this course, students clearly understand basic principles, be able to see relationships between ideas, and be able to use principles and ideas to calculate properties of simple statistical systems students will learn assumptions of kinetic theory of gases, transport phenomenon. 2. Thermodynamical Functions and Maxwell Relations, Elementary concepts of Statistics such as probability, distribution functions, Gaussian Probability distribution etc. Statistical distribution of system of particles, Different statistical ensembles: micro canonical, canonical and calculation of mean values in canonical ensembles, Maxwell-Boltzmann's, Bose Einstein , Fermi Dirac Statistics, comparison of the distribution. Problem solving on respective points.

	Atomic and Molecular Physics	<p>The structure of matter, in the form of atoms and molecules, is a fundamental subject in physics. The study of atoms and molecules has played a major role in the development of physics and in the development of our understanding of the structures of matter as it is encountered in everyday life. On successful completion of this course students will be able to understand about- Development of Atomic structures starts from Rutherford's atomic model up to Vector atomic model. Concept of atomic absorption and emission spectra, spectra associated with hydrogen atom</p> <p>Pauli Exclusion Principle, Spectral notation for quantum states. The concepts of space quantization, Spectra of sodium atom</p> <p>LS and jj coupling schemes associated with two valence electron system. The splitting of atomic energy levels and associated spectral lines when atoms are placed in external magnetic and electric field: Zeeman Effect, Stark Effect.</p> <p>The idea about x-ray spectroscopy, molecular spectroscopy. Details about the Raman Effect and Applications.</p>
	Nuclear Physics	<p>The students will have an understanding of the structure of the nucleus, radioactive decay, nuclear reactions and the interaction of nuclear radiation with matter. The students will have an understanding of quantum behavior of atoms in external electric and magnetic fields.</p> <p>At the end of the course, students will have thorough knowledge basic nuclear forces ; composition of nucleus etc and problem solving skills related to the Nuclear Physics T.Y. B.Sc. Syllabus topics</p> <p>Internal class test I</p> <p>Home Assignment (Book Problem solving)</p> <p>Internal class test II</p>
	Computational Physics	<p>Computational Physics course is a foundation course. In this course, student will learn basic concepts of algorithms and flowcharts, programming in C language, errors in computations and various numerical analysis methods such as, obtaining roots of a function, finding integration. Also, students will get practice of programming through small programs like sorting array, graphics, finding factorial, using functions and pointers etc.</p>
	Electronics/Advanced Electronics	<ol style="list-style-type: none"> 1. Able to design various circuits which can be used professionally. 2. Able to understand AC, DC current/voltages concept for safety measurements. 3. Able to design various types of power supply, which can be used professionally. 4. Able to design communication systems.
	Elements of Materials Science	<ol style="list-style-type: none"> 1. Student will know the various properties of materials which are using day to day life. 2. They easily identify the concept of Physics used and extend their knowledge towards.

	Physics of Nanomaterials	<ol style="list-style-type: none"> 1. The main objectives of course are to introduce the basic physics behind size and effect of nano-materials and to understand the working principle of equipments used in nanostructures. In this course, students will gain knowledge of introduction to nanomaterials and their properties and growth techniques. It also discusses tools like UV, XRD, SEM and TEM to characterize the nanomaterials and applications of nanomaterials. 2. There are following modules in this course: <ol style="list-style-type: none"> 1. Introduction to nanomaterials 2. Methods of Synthesis of nanomaterials 3. Characterization Techniques 4. Properties of nanomaterials 5. Special Nanomaterials 6. Applications <p>After successfully completing this course students get thorough knowledge of background of nanomaterials, their synthesis methods, characterization techniques, properties and applications.</p>
	Practical course- I	To increase the understanding depth of theoretical concept like properties of matter, quantum mechanics, nuclear physics, statistical mechanics, electrodynamics etc.

M.Sc. Physics

Program Offered

No.	Program	Program Objectives	Program Specific Outcomes
2.	M. Sc. Physics	<ol style="list-style-type: none"> 1. To foster scientific attitude, provide in-depth knowledge of scientific and technological concepts of Physics. 2. To enrich knowledge through problem solving, minor/major projects, seminars, tutorials, review of research articles/papers, participation in scientific events, study visits, etc. 3. To familiarize with recent scientific and technological developments. 4. To create foundation for research and development in Physics. 5. To help students to learn various experimental and computational tools thereby developing analytical abilities to address real world problems. 6. To train students in skills related to research, education, industry and market. 7. To help students to build-up a progressive and successful career in Physics. 	<ol style="list-style-type: none"> 5. Student will have in depth knowledge of the subject. 6. Students will have acquired necessary communication skills to teach Physics in Colleges. 7. Students will have acquired necessary skills for working in research institutes. 8. Students will have acquired necessary skills and expertise to work in industry related to materials processing and quality control

Courses Offered

Sr. No.	Course	Course Outcome
M. Sc.-I		
Semester 1	1. Mathematical Methods in Physics PHCT-111 Credit 4	<p>There are following four modules in this course:</p> <ol style="list-style-type: none"> 1. Linear spaces and operators 2. Matrix algebra 3. Special Functions 4. Fourier Series and Integral Transforms <p>This is a foundation course required for studying other advanced courses in physics. In this course we taught basic and advanced mathematical background required for understanding and utilizing the mathematics for other theory courses taught. After successfully completing this course students get thorough knowledge of linear spaces, matrix algebra, special functions, fourier series and integral transforms.</p>
	2. Classical Mechanics PHCT-112 Credit-4	<p>The concept and theories of classical physics enable students to classify and describe in more or less detail an extensive field of physical phenomena. It contributes to our knowledge of working of nature and the universe. That is why a detailed exposition of classical mechanics to every student, opting for physics, is so vitally important for clear understanding of recent intricate theories of modern physics, for they are built on well – developed and conceptualized foundation of classical mechanics.</p> <p>The course aims to develop an understanding of Lagrangian and Hamiltonian formulation which allow for simplified treatments of many complex problems in classical mechanics and provides the foundation for the modern understanding of dynamics.</p> <p>Learning Outcomes:</p> <ol style="list-style-type: none"> 1. The students will be able to apply the Variational Principles to real physical problems. 2. The students will be able to model mechanical systems, both in inertial and rotating frames, using Lagrange and Hamilton equations. <p>At the end of the course, students will have thorough knowledge and problem solving skills related to the Classical mechanics.</p>
	3. Quantum Mechanics PHCT-113 Credit-4	<p>In this course will learn basic as well as advanced concepts of quantum mechanics. In basics concepts, apart from revision of basic concepts, students will also learn about Representation of states and dynamical variables, observables, selfadjoint operators, eigen functions and eigen values, degeneracy, Dirac delta function, Completeness and closure property, Physical interpretation of eigen values, eigen functions and expansion coefficients, eigen values and eigen functions of momentum operator. In advanced concepts, students will learn about Hilbert space, Dirac notations, operator method for solving SHO problem, theory of angular momentum and approximations methods such as Time-independent Perturbation theory, Time-dependent Perturbation theory, Fermi's golden rule, WKB approximation and Variational method and their applications</p>

Semester 2	4. Electronics PHOT-114 Credit-4	Student can easily identify electronic devices used in home appliance. Hence, can develop their thinking level with appliances. In digital electronics, they easily how understand data conversion takes place.
	5. Physics Laboratory – I (Electronics) PHCP-115 Credit-4	<ol style="list-style-type: none"> 1. To learn to design and build various electronics experiments such as oscillators, waveform generator, V to F converter, etc. 2. To develop ability to find faults in the electronic circuits. 3. To learn handling various electronic instruments and components such as CRO, power supply, multimeter, IC 741. 4. To understand precision rectifier and filter circuits. 5. To correlate experimental results with the theory.
	1 Electro dynamics PHCT-121 Credit-4	<p>To evaluate fields and forces in Electrodynamics and Magneto dynamics using basic scientific method. To provide concepts of relativistic electrodynamics and its applications in branches of Physical Sciences.</p> <p>Learning Outcomes:</p> <ol style="list-style-type: none"> 1. Understanding of Basics laws of Electromagnetism. 2. To explain and solve advanced problems based on classical electrodynamics using Maxwell's equation. 3. The students will be able to analyze s radiation systems in which the electric dipole, magnetic dipole or electric quadruple dominate. 4. The students will have an understanding of the covariant formulation of electrodynamics and the concept of retarded time for charges undergoing acceleration. <p>At the end of the course, students will have thorough knowledge and problem solving skills related to the Electrodynamics.</p>
	2. Solid State Physics PHCT-122 Credit-4	<ol style="list-style-type: none"> 1. Students will be able to analyze detailed over view of X ray diffraction and crystal structure identification of material. 2. Use the basic knowledge of band theory in complex analysis of bands and density of stated used generally in density functional theory. 3. Pursue research in area of condensed matter Physics and Materials science. Also in area of superconductivity and magnetism to design high temperature superconductor and to prepare magnetic data storage materials for application purpose. 4. Basics of magnetism gives descent amount of information to students so that without doing any experiment they can predict the type of magnetic material depending upon the electron distribution in material. 5. Introduction to dielectric material is useful and will be useful for the application of various material in the ceramic and capacitor industry.

3.Statistical Mechanics PHCT-123 Credit-4	<ol style="list-style-type: none"> 1. After completing the course students should have understanding of specification of state of the system for various physical systems of interest. 2. Should have understood the basic probability calculations and types of ensembles. 3. Should have deep understanding of the statistical description of physical systems and should be able apply techniques learned in statistics to the mechanics. 4. Understanding of microcanonical, canonical and grand canonical ensembles. 5. Understanding of equipartition theorem and applying it to study mean kinetic energy, Brownian motion, harmonic oscillator, etc. 6. Should be able to write partition function of physical systems. 7. Should be able to write quantum distribution functions and apply them to quantum systems. 8. Understanding of ideal Bose systems. 9. Understanding of ideal Fermi systems.
4. Atoms and Molecules PHOT-124 Credit-4	<p>In this course students will learn about atomic spectra, bonding mechanism in molecules, molecular spectra, various spectroscopic techniques Microwave Spectroscopy, infrared spectroscopy, Raman spectroscopy, microwave absorption by H₂O, FTIR spectroscopy and analysis of HCl spectrum, Structure determination using IR and Raman spectroscopy (diamond), Applications. Resonance spectroscopy (ESR and NMR). Students will understand principles of ESR and NMR, and construction of ESR and NMR spectrometers, and their applications.</p>
6. Physics Laboratory - II PHCP-125 Credit-4	<ol style="list-style-type: none"> 1. Be able to perform experiments like Frank-Hertz experiment and should be able to analyze the data. 2. Be able to perform experiment to determine skin depth of a conductor and compare the observed value with the theoretical value and find the sources of error. 3. Be able to operate GM tube to study characteristics of radio activity. 4. Be able to determine the Lande's g factor by using Electron spin resonance experiment. 5. Be able to get the iodine spectrum and study it. 6. Be able to get steady interference pattern using etalon and determine the spacing between to plates of etalon. 7. Should be able to understand the basics of determination of resistivity of a thin film by using four probe method. 8. To be able to perform Black Body Radiation experiment.

M. Sc. –II

	Statistical Mechanics in Physics	<ol style="list-style-type: none"> 1. After completing the course students should have understanding of specification of state of the system for various physical systems of interest. 2. Should have understood the basic probability calculations and types of ensembles. 3. Should have deep understanding of the statistical description of physical systems and should be able apply techniques learned in statistics to the mechanics. 4. Should be able to write partition function of physical systems. 5. Should be able to write quantum distribution functions and apply them to quantum systems.
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	Physics of Semicon	<p>Student should be able :</p> <p>To understands the basic concepts of semiconductor, PN junction, Transistors and Hetero-junction.</p> <p>To solve numerical based on the concepts of semiconductors.</p>
	Departmental Course I –Physics of thin films	<ul style="list-style-type: none"> • To introduce the students to basics area of research. • Introduction to different types of experimental thin films deposition technique. • To understand the basic properties of thin film like how the electrical, optical and mechanical properties of thin film changes with film thickness. • To promote the students to seek research as career. • To prepare thin film structure by using various methods
	Departmental Course II – Instrumentation-I	<p>After completing the course students should have</p> <ol style="list-style-type: none"> 1. gained sufficient knowledge of design and working of varies measuring Instruments 2. understood functional description of measuring instruments 3. acquired necessary skills for designing new measuring instruments 4. understood the functioning of various electrical transducers 5. Understood the data acquisition systems 6. Required skills for designing a sensor based application.
	Special Lab I	<p>After completing Thin Film part of this course students should be able to</p> <ol style="list-style-type: none"> 1. To acquire scientific skills in using laboratory equipment and other laboratory materials. 2. To demonstrate an ability to collect data through observation and experimentation and interpreting data. 3. To demonstrate laboratory procedures for safety from chemicals and scientific instruments handling. 4. To understand abstract concepts and theories gained by experiment and visualizing them. 5. To develop collaborative and mutual teamwork practice amongst students. 6. Application of content of course for industry <p>After completing Instrumentation part of this course students should be able to</p> <ol style="list-style-type: none"> 1. Design an instrumentation amplifier and design its gain 2. Understand the working of digital to analogue converter using R-2R ladder network and using IC 3. Design a Linear Variable differential Transducer 4. Understand the working of strain gauge 5. Understand the working of thermocouple amplifier circuit.

	Physics Lab III	The objective of this course is to enable students to use numerical methods in solving problems in Physics and any other areas. Students will be able to generate Legendre polynomials and Bessel functions of the first kind. They will understand the concept of Monte Carlo Simulation, Euler method, Gauss elimination method, interpolation and graphics programming using C language. Also, they will learn about applications of these methods to some physics problems such as charging and discharging of capacitor, circuit analysis, motion of charged particle.
	Nuclear Physics	Student should be able to : To understand the basic concepts of Nuclear physics such as properties of semiconductor, Nuclear detectors, accelerators, Nuclear reactors, and elementary particles. To solve numerical based on the concepts of Nuclear physics.
	Material Science	<ol style="list-style-type: none"> 1. At the end of course Students should have gained deep understanding of the various properties of materials. 2. Students should be able to analyze the mechanism of formation of defects in the materials and estimate the densities of defects in the materials. 3. Students should be able to understand the mechanism of diffusion and the applications of diffusion. 4. Should be able to find the Gibbs' free energy of mixing of solutions. 5. Should be able to draw and analyze phase diagrams of various systems of physical interest.
	Departmental Course III Physics of Nano materials	<p>There are following four modules in this course:</p> <ol style="list-style-type: none"> 1. Quantum size effects 2. Physical and Chemical Methods for Synthesis of Nanomaterials 3. Special Nanomaterials 4. Properties and Applications of Nanomaterials <p>This course introduces the students the emerging and exciting technology of the century i.e. Nanotechnology. This course acts as a bridge for the students who want to continue research in the field of Nanotechnology. Students get thorough knowledge of basics and few advanced concepts in the field of nanotechnology after successfully completing this course.</p>
	Departmental Course	In automation era, every appliance is semi or fully automated. By studying such syllabus they better understand, automation process, components, troubleshooting

	Special Lab II	At the end of the course, students will have thorough knowledge and problem solving skills related to the following topics: List of Experiments: 1. Synthesis of metallic nanoparticles by wet chemical method 2. Synthesis of metal oxide nanoparticles by electrochemical method 3. Preparation of porous silicon using electrochemical etching method 4. Study of optical absorption of nanoparticles (UV-visible spectroscopy) and determination of particle size 5. Determination of particle size of nanoparticles from X-ray diffraction 6. Study of photoluminescence of nanoparticles 7. Synthesis of metal oxide nanoparticles by Hydro-thermal method.
	Physics Lab IV: Project	1. Project students learn applications of concept of physics, development and setting of experimental set ups. 2. It also creates research aptitude amongst the students for further studies. 3. Project study gives introduction to research work usually carried out in research degrees like M.Phil and Ph.D. 4. Some project which are applied can be used and find application in day to day life.

Political Science
Department of Political Science

1. Departmental Profile

The Department of Political Science has been working since the inception of the College in the year 1947 Political Science. The post graduate course was started in 1959. The Department has made remarkable progress in arranging the guest lecturers and group discussions. The Department takes individual interest, care and concern in promoting the studies of the students. It encourages the students to actively participate in the teaching learning, research and evaluation activities. It also maintains cordial relation with the students and staff members. Department has been striving hard to improve the education standard of its students and their results in the examination. Department is getting good results.

The following persons have played important role in the shaping and developing the Department of Political Science in the capacity of Head of the Department Dr. Kantilal Bhagat, Dr. R. C. Shaikh, Prof. K. P. Jadhav, Dr. B. A. Kamble and presently Dr. S. J. Kavade.

In present Dr. S. B. Wadekar, Prof. V.V. Nabde, Ms. P. C. Ghodke, Ms. A. V. Torpe, Mr. B. D. Kasote are working in the department.

The Department of Political Science seek to provide students with a learning experience that will equip them to face the challenges of an increasingly complex job market and prepare them to become active and engaged citizens at the local, national and international levels. The political science program provides students with a broad-based political education that is grounded in the field's theoretical traditions. This includes a strong background in the fundamental branches of our discipline: American politics, comparative politics, international politics, political theory and public administration. Political science students acquire practical experience and develop connections in the community through a variety of legal internships.

2. Programme Outcomes

Sr. No.	Program	Program Objectives	Program Specific Objectives
1	Bachelor of Art (BA)	<p>PO1 Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.</p> <p>PO2. Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.</p> <p>PO3.Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.</p> <p>PO4.Ethics: Recognize different value systems including your own,</p>	<p>FYBA (Sem. I & II) G-I Introduction to Indian Constitution i. It focuses in detail of salient features of Indian Constitution. ii. The students will acquaint with the basic framework of the government. iii. It simultaneously studies in detail the political structure both Constitutional and Administrative. iv. To familiarize students with the working of the Constitution of India.</p> <p>SYBA G-2 Political Theory & Concepts i. It introduces the concepts, ideas and theories in political theory. ii. It seeks to explain the evolution and usage of these concepts, ideas and theories with reference to individual thinkers both historically and analytically. iii. The different ideological standpoints with regard to various concepts and theories are to be critically explained with the purpose of highlighting the differences in their perspectives and in order to understand their continuity and change. iv. Furthermore there is a need to emphasize the continuing relevance of these concepts today and explain how an idea and theory of yesteryears gains prominence in contemporary political theory.</p> <p>SYBA S-1 Western Political Thoughts i. It studies the classical tradition in political theory from Plato to Marx with the view to understand how the great</p>

		<p>understand the moral dimensions of your decisions, and accept responsibility for them.</p> <p>PO5.Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes</p>	<p>Masters explained and analyzed political events and problems of their time and prescribed solutions.</p> <p>ii. The texts are to be interpreted both in the historical and philosophical perspectives to understand the universality of the enterprise of political theorizing.</p> <p>iii. The limitations of the classical tradition, namely its neglect of women's concerns and issues and the non-European world are critically examined.</p> <p>iv. The legacy of the thinkers is explained with the view to establish the continuity and change within the Western political tradition.</p> <p>SYBA S-2 Political Sociology</p> <p>i. The purpose of this course is to explain the non -institutional political processes and thereby to sensitize the students on informal processes of politics.</p> <p>ii. To provide a deeper understanding of the concepts and approaches related to political sociology.</p> <p>iii. To explain the social context of politics to the students</p> <p>TYBA G-3 local Self Government in Maharashtra</p> <p>i. To introduce the students to the structure of Local Self Government of Maharashtra.</p> <p>ii. To make students aware of the various Local Self Institutions, their functions, compositions and importance.</p> <p>iii. To identity the role of Local Government and Local Leadership in development.</p> <p>TYBA S-3 Public Administration</p> <p>i. It is an introductory course in Public Administration.</p> <p>ii. The essence of Public Administration lies in its effectiveness in translating the governing philosophy into programmes, policies and activities and making it a part of community living.</p> <p>iii. It covers personnel public administration in its historical context thereby proceeding to highlight several</p>
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			<p>of its categories, which have developed administrative salience and capabilities to deal with the process of change.</p> <p>iv. The recent developments and particularly the emergence of New Public Administrations are incorporated within the larger paradigm of democratic legitimacy.</p> <p>v. The importance of legislative and judicial control over administration is also highlighted</p> <p>TYBA S-4 International Politics</p> <p>i. It deals with concepts and dimensions of international relations and makes an analysis of different theories highlighting the major debates and differences within the different theoretical paradigms.</p> <p>ii. The dominant theories of power and the question of equity and justice, the different aspects of balance of power leading to the present situation of a unipolar world are included.</p> <p>iii. It highlights various aspects of conflict and conflict resolution, collective security and in the specificity of the long period of the post Second World War phase of the Cold War, of Détente and Deterrence leading to theories of rough parity in armaments.</p>
2	Master of Art (MA)	<p>PO1 Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.</p> <p>PO2. Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make</p>	<p>MA- I (Semester-I)</p> <p>PO-C1: Traditions of Political Thought</p> <p>i. This Course is meant to serve as a window on the major traditions of thought that have shaped political discourse in different parts of the world over the last three millennia.</p> <p>ii. It stresses the great diversity of social contexts and philosophical visions that have informed the ideas of key political thinkers across epochs.</p> <p>iii. The chief objective is to project the history of political thought as a series of critical, interconnected and open-ended conversations about the ends and means of the good life.</p> <p>PO- C2 Administrative Theory</p>

		<p>meaning of the world by connecting people, ideas, books, media and technology.</p> <p>PO3.Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.</p> <p>PO4.Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.</p> <p>PO5.Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.</p> <p>PO6.Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.</p> <p>PO7.Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes</p>	<p>i. It seeks to help students understand important concepts, approaches and theories of public administration.</p> <p>ii. The course aims to equip students with understanding of the latest developments in the field of Public Administration.</p> <p>iii. The course will be useful for students who seek to understand and analyze broad transformations in the study of public administration in the course of changes in socio-economic and political life.</p> <p>PO- C3 Political Institutions in India</p> <p>i. It introduces the student to the leading institutions of the Indian political system and to the changing nature of these institutions.</p> <p>ii. Apart from explaining the structure and functions of the main institutions the course will try to acquaint students with the idea of institutional balance of power as discussed in the Indian constitution and as developed during the functioning of Indian democracy over the past six decades.</p> <p>PO- O4 Party System in India</p> <p>i. It introduces students to the nature of party system in India and to the functioning of main political parties operating in the system.</p> <p>ii. The course will also acquaint students with analytical perspectives on party politics in India</p> <p>MA- I (Semester-II)</p> <p>PO – C4 Comparative Political Analysis</p> <p>i. To understand the trajectory of the sub-discipline.</p> <p>ii.To understand the significance of the comparative methodology</p> <p>iii. To understand the dynamics of domestic politics across the countries.</p> <p>PO-C5 : Theory of International Politics</p> <p>i. It introduces the students to the evolution and important theories. Students need a brief history of</p>
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		<p>international politics to understand why we study the subject and how current scholarship is informed by what preceded it.</p> <p>ii. Theories provide interpretative frameworks for understanding what is happening in the world and the levels of analysis. Competing theories are presented.</p> <p>PO- C6 Public Policy</p> <p>i. It provides students an understanding of the basic concepts, theories and process of public policy.</p> <p>ii. The course also seeks to help students understand policy processes and actors involved in it by studying specific policies.</p> <p>iii. It attempts to help students understand and analyze policy making in practical context.</p> <p>PO-05- Politics and the Media</p> <p>i.This course is designed to help the students to think about the relationship between the news media and politics.</p> <p>ii.The Students will know about the impact of report on viewers and ultimately on the political system.</p> <p>iii.This course help to understand the role of media in political processes.</p> <p>iv.The course is intended to advance students understanding of the role of media and communication in political process.</p> <p>MA Part II Semester III</p> <p>PO-C7: Political Thinking in Modern India</p> <p>i. introduces the student to the key ideas of political thinking in modern India as it shaped in the colonial context.</p> <p>ii. The course is woven around ideas/ issues and not around individual thinkers. Students will be encouraged to understand and decipher the diverse and often contesting ways in which ideas of nationalism, democracy and social</p>
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		<p>transformation were discussed by leading Indian thinkers.</p> <p>PO-C8: Political Sociology</p> <p>i. introduce the overall scope of the sub-discipline of political sociology.</p> <p>ii. The focus of the course will be on the political sociology of power. The emphasis is on the nature of power in modern societies—more in the form of organizations and social formations than as individual power.</p> <p>iii. Students are also expected to understand different forms of justifications of power and the role of ideology in this regard. State will be studied as a repository of power in society while class and patriarchy are two instances of how the nature of power is shaped by social factors.</p> <p>PO-C 9: Theory of International Relations</p> <p>i. It introduces the students to the evolution and important theories. Students need a brief history of international politics to understand why we study the subject and how current scholarship is informed by what preceded it.</p> <p>ii. Theories provide interpretative frameworks for understanding what is happening in the world and the levels of analysis. Competing theories are presented.</p> <p>PO-O 10: Indian Administration</p> <p>I. The objective of this course is to provide students with broad understanding of key dimensions of Indian Administration functioning at different levels.</p> <p>ii. The objective of the course is to help students to understand and analyze the administrative reforms introduced recently to make administration people-centric and to what extent that goal has been realized.</p> <p>M. A. Part II Semester IV</p>
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			<p>functioning of main political parties operating in the system.</p> <p>ii. The course will also acquaint students with analytical perspectives on party politics in India</p>
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3. Courses offered-

Sr. No.	Course	Course Outcomes
1	FYBA G-I Introduction to Indian Constitution (Semester I &II)	<p>i. It focuses in detail of salient features of Indian Constitution.</p> <p>ii. The students will acquaint with the basic framework of the government.</p> <p>iii. It simultaneously studies in detail the political structure both Constitutional and Administrative.</p> <p>iv. To familiarize students with the working of the Constitution of India.</p>
2.	SYBA G – 2 Political Theory & Concepts	<p>i. It introduces the concepts, ideas and theories in political theory.</p> <p>ii. It seeks to explain the evolution and usage of these concepts, ideas and theories with reference to individual thinkers both historically and analytically.</p> <p>iii. The different ideological standpoints with regard to various concepts and theories are to be critically explained with the purpose of highlighting the differences in their perspectives and in order to understand their continuity and change.</p> <p>iv. Furthermore there is a need to emphasize the continuing relevance of these concepts today and explain how an idea and theory of yesteryears gains prominence in contemporary political theory.</p>
	SYBA S-1 Western Political Thoughts	<p>i. It studies the classical tradition in political theory from Plato to Marx with</p>

		<p>the view to understand how the great Masters explained and analyzed political events and problems of their time and prescribed solutions.</p> <p>ii. The texts are to be interpreted both in the historical and philosophical perspectives to understand the universality of the enterprise of political theorizing.</p> <p>iii. The limitations of the classical tradition, namely its neglect of women's concerns and issues and the non-European world are critically examined.</p> <p>iv. The legacy of the thinkers is explained with the view to establish the continuity and change within the Western political tradition.</p>
	SYBA S-2 Political Sociology	<p>i. The purpose of this course is to explain the non-institutional political processes and thereby to sensitize the students on informal processes of politics.</p> <p>ii. To provide a deeper understanding of the concepts and approaches related to political sociology.</p> <p>iii. To explain the social context of politics to the students</p>
3.	TYBA G-3 local Self Government in Maharashtra	<p>i. To introduce the students to the structure of Local Self Government of Maharashtra.</p> <p>ii. To make students aware of the various Local Self Institutions, their functions, compositions and importance.</p> <p>iii. To identify the role of Local Government and Local Leadership in development.</p>
	S-3 Public Administration	<p>i. It is an introductory course in Public Administration.</p> <p>ii. The essence of Public Administration lies in its effectiveness in translating the governing philosophy into programmes, policies and activities and making it a part of community living.</p> <p>iii. It covers personnel public administration in its historical context thereby proceeding to highlight several of its categories, which have developed administrative salience and capabilities to deal with the process of change.</p>

		<p>iv. The recent developments and particularly the emergence of New Public Administrations are incorporated within the larger paradigm of democratic legitimacy.</p> <p>v. The importance of legislative and judicial control over administration is also highlighted.</p>
	S-4 International Politics	<p>i. It deals with concepts and dimensions of international relations and makes an analysis of different theories highlighting the major debates and differences within the different theoretical paradigms.</p> <p>ii. The dominant theories of power and the question of equity and justice, the different aspects of balance of power leading to the present situation of a unipolar world are included.</p> <p>iii. It highlights various aspects of conflict and conflict resolution, collective security and in the specificity of the long period of the post Second World War phase of the Cold War, of Détente and Deterrence leading to theories of rough parity in armaments.</p>
4.	MA- I (Semester-I) PO- C1 Traditions of Political Thoughts	<p>PO-C10: Traditions of Political Thought</p> <p>i. This Course is meant to serve as a window on the major traditions of thought that have shaped political discourse in different parts of the world over the last three millennia.</p> <p>ii. It stresses the great diversity of social contexts and philosophical visions that have informed the ideas of key political thinkers across epochs.</p> <p>iii. The chief objective is to project the history of political thought as a series of critical, interconnected and open-ended conversations about the ends and means of the good life</p>
	PO- C2 Administrative Theory	<p>i. It seeks to help students understand important concepts, approaches and theories of public administration.</p> <p>ii. The course aims to equip students with understanding of the latest developments in the field of Public Administration.</p> <p>iii. The course will be useful for students who seek to understand and analyze</p>

		broad transformations in the study of public administration in the course of changes in socio-economic and political life.
	PO- C3 Political Institutions in India	<p>i. It introduces the student to the leading institutions of the Indian political system and to the changing nature of these institutions.</p> <p>ii. Apart from explaining the structure and functions of the main institutions the course will try to acquaint students with the idea of institutional balance of power as discussed in the Indian constitution and as developed during the functioning of Indian democracy over the past six decades.</p>
	PO- O4 Party System in India	<p>i. It introduces students to the nature of party system in India and to the functioning of main political parties operating in the system.</p> <p>ii. The course will also acquaint students with analytical perspectives on party politics in India.</p>
5.	MA- I (Semester-II) PO- C4 Comparative Political Analysis	<p>i. To understand the trajectory of the sub-discipline.</p> <p>ii. To understand the significance of the comparative methodology</p> <p>iii. To understand the dynamics of domestic politics across the countries.</p> <p>It provides students an understanding of the basic concepts, theories and process of public policy.</p> <p>ii. The course also seeks to help students understand policy processes and actors involved in it by studying specific policies.</p> <p>iii. It attempts to help students understand and analyze policy making in practical context.</p>
	PO- C5 Theory of International Politics	<p>i. This course applies the theories and used to illustrate how each level of analysis the international system, the state, and the individual- to help in organizing and conceptualizing the issues.</p> <p>ii. The major issues of the twenty first century- security, economics and transnational issues are presented and analyzed.</p>

	PO – C6 Public Policy	<p>It provides students an understanding of the basic concepts, theories and process of public policy.</p> <p>ii. The course also seeks to help students understand policy processes and actors involved in it by studying specific policies.</p> <p>iii. It attempts to help students understand and analyze policy making in practical context.</p>
	PO- O5 Politics and The Media	<p>i.This course is designed to help the students to think about the relationship between the news media and politics.</p> <p>ii.The Students will know about the impact of report on viewers and ultimately on the political system.</p> <p>iii.This course help to understand the role of media in political processes.</p> <p>iv.The course is intended to advance students understanding of the role of media and communication in political process.</p>
6.	MA Part II Semester III PO-C7: Political Thinking in Modern India	<p>i. introduces the student to the key ideas of political thinking in modern India as it shaped in the colonial context.</p> <p>ii. The course is woven around ideas/ issues and not around individual thinkers. Students will be encouraged to understand and decipher the diverse and often contesting ways in which ideas of nationalism, democracy and social transformation were discussed by leading Indian thinkers.</p>
	PO-C8: Political Sociology	<p>i. introduce the overall scope of the sub-discipline of political sociology.</p> <p>ii. The focus of the course will be on the political sociology of power. The emphasis is on the nature of power in modern societies—more in the form of organizations and social formations than as individual power.</p> <p>iii. Students are also expected to understand different forms of justifications of power and the role of ideology in this regard. State will be studied as a repository of power in society while class and patriarchy are two</p>

		instances of how the nature of power is shaped by social factors.
	PO-C 9: Theory of International Relations	<p>i. It introduces the students to the evolution and important theories. Students need a brief history of international politics to understand why we study the subject and how current scholarship is informed by what preceded it.</p> <p>ii. Theories provide interpretative frameworks for understanding what is happening in the world and the levels of analysis. Competing theories are presented.</p>
	PO-O 10: Indian Administration	<p>I. The objective of this course is to provide students with broad understanding of key dimensions of Indian Administration functioning at different levels.</p> <p>ii. The objective of the course is to help students to understand and analyze the administrative reforms introduced recently to make administration people-centric and to what extent that goal has been realized.</p>
7.	M. A. Part II Semester IV PO-C10: Traditions of Political Thought	<p>i. This Course is meant to serve as a window on the major traditions of thought that have shaped political discourse in different parts of the world over the last three millennia.</p> <p>ii. It stresses the great diversity of social contexts and philosophical visions that have informed the ideas of key political thinkers across epochs.</p> <p>iii. The chief objective is to project the history of political thought as a series of critical, interconnected and open-ended conversations about the ends and means of the good life.</p>
	PO-C11: Political Process in India	<p>i. It will introduce to the student the key issues and details of the political process in post independence India.</p> <p>ii. It will also try to develop among students a perspective to understand and analyse Indian politics.</p> <p>iii. The aim is to help students understand the expansive meaning of political process as it shapes in the arena of electoral and party politics, in the form of</p>

		mass mobilizations and as politics of interests.
	PO-C12: Political Participation	<p>i. It is a continuation of the study of power. Political action is seen as integrally related to search for and justifications of power.</p> <p>ii. Political socialization is the process that shapes the durable set of attitudes and beliefs which affect nature and extent of participation. Public opinion also shapes political activity.</p> <p>iii. The course expects that students will go beyond the study of routine participation and understand the relevance of collective action in the form of social movements and/or collective violence.</p>
	PO-O14: Party System in India	<p>i. It introduces students to the nature of party system in India and to the functioning of main political parties operating in the system.</p> <p>ii. The course will also acquaint students with analytical perspectives on party politics in India.</p>

Psychology

Course offered at under graduate and Post graduate 2019-20

Sr. No.		Program Objectives	Program Outcomes Specific
1	F Y B A Semi I General Psychology	1.To provide in basic and development fundamentals knowledge of Psychology .	Knowledge Base in Psychology: Majors will demonstrate fundamental knowledge and comprehension of the major concepts, theoretical perspectives historical trends, and empirical findings in psychology.
	FYBA Semi.II Social Psychology	1. Acquaint Students with basic concepts, theories and applications of Social psychology 2. Familiarize students with group behaviour 3. Underline the importance of Close Relationships and Pro- social behaviour	a) Understand the basics of social psychology. b) Understand the nature of self, concept of attitude and prejudice of the individual. c) Assess the interactional processes, love and aggression in our day today life. . c) Understand group dynamics and individual in the social world.

2	S Y B A G 1 Social Psychology	<p>1. Acquaint Students with basic concepts, theories and applications of Social psychology</p> <p>2. Familiarize students with group behaviour</p> <p>3. Underline the importance of Close Relationships and Pro- social behaviour</p>	<p>Social Psychology is the study of social interaction and social influence. As such, it remains one of the most comprehensive and personally relevant areas within the field of psychology.</p> <p>The topics covered will be representative of the current subject matter within this discipline. A detailed examination of current research findings and application programs related to the topic under study will be made through text readings, original research articles, class lectures, and films. Fundamental assumptions and concepts underlying various theories about social phenomenon will be critically assessed on the basis of experimental evidence. Furthermore, as a general education course, this class attempts to provide opportunities to acquire certain skills which are useful not only in the context of investigating, understanding, and influencing human behavior but which are generalizable to other aspects of life. In addition to and expanding upon what is stated above, it is important to note that this course has four key objectives. The first is to expand your knowledge about social psychology and human behavior. To accomplish this goal, the course will emphasize (1) acquisition of knowledge that goes beyond mere memorization of facts and moves students to an understanding of and ability to use certain fundamental concepts and principles</p>
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			<p>involved in human behavior, (2) an awareness of the major problems and issues in the discipline of social psychology, and (3) the capacity to interpret research findings.</p>
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3	S Y B A S I Abnormal Psychology	<p>1. To acquaint students with the recent classification of abnormality.</p> <p>2. To help students to acquire the knowledge about the causes, symptoms and treatments of various types of psychological disorders.</p>	<p>1. Theoretical Perspectives: Defining Abnormal Behavior</p> <p>2. Research Methods in Abnormal Psychology</p> <p>3. Nervous System, Endocrine System, and Abnormal Behavior</p> <p>4. Clinical Assessment, Interpretation and Diagnosis of Abnormal Behavior</p> <p>5. Classification of Abnormal Behavior (Diagnostic and Statistical Manual of Mental Disorders)</p> <p>6. Personality Disorders</p> <p>7. Anxiety Disorders</p> <p>8. Somatoform, Factitious, and Dissociative Disorders</p> <p>9. Sexual and Gender Disorders</p> <p>10. Mood Disorders</p> <p>11. Schizophrenia</p> <p>12. Delirium and Dementia</p> <p>13. Substance-Related Disorders</p> <p>14. Eating Disorders</p> <p>15. Sleep Disorders</p> <p>16. Impulse Control Disorders</p> <p>17. Treatment of Abnormal Behavior. Biological and psychological therapies.</p>
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4	S Y B A S2 Developmental Psychology	1. To acquaint the students with the basic concepts of human development processes. 2. To help the students to understand influences of various factors on development.	<ol style="list-style-type: none"> 1. Demonstrate an understanding of the biological, psychological, social and cultural influences of lifespan human development; 2. Demonstrate an understanding of how gender, ethnicity, class, historical period, and social location relate to the life course experience; 3. Critically evaluate research relevant to human development as well as popular notions of human nature; 4. Use the primary literature of the field to prepare a clear, organized summary of a topic; 5. Understand and work effectively with a diversity of individuals and communities; 6. Apply theory and research to contemporary problems and real-world situation; 7. Design and implement research, analyze data appropriately, and judge the significance of findings.
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5	T Y B A G3 Applied Psychology	1- The emergence of Industrial and Organizational Psychology 2- The work done in Industrial and Organizational Psychology 3- The significance of training, performance appraisal, leadership models 4- The importance of Engineering Psychology 5. Help students to understand the relationship between theoretical and applied aspects of Psychology 6. Acquaint students with various applications of Psychology 7. Familiarize students with problems and solutions in various applied fields 8. Apprise students of the role of Psychologists in various applied fields.	<p>To produce graduates with effective interpersonal skills who can work in a variety of practical settings.</p> <p>To enable students to obtain the knowledge and skills necessary for immediate employment and/or graduate study in psychology and related areas.</p> <p>To provide opportunities for students who wish to apply psychology training to employment in business and human service related organizations or to prepare for graduate programs in related areas.</p> <p>Students will demonstrate an understanding of and be able to use major research methodologies in psychology, including design, data analysis, and interpretation</p> <p>Students will demonstrate knowledge and understanding of relevant ethical issues including a general understanding of the APA Code of Ethics.</p> <p>Students will demonstrate basic counseling.</p>
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6	TYBAS3 Scientific Research and Experimental Psychology(Theory)	<ol style="list-style-type: none"> 1. To acquaint the students with the basic concepts of experimental psychology and research methodology, 2. To develop the spirit of scientific inquiry in the students, 3. To help them generate ideas for research, as well as develop hypotheses and operational definitions for variables. 4. To help students understand the basic steps in scientific research, 5. To equip the students with the basic information and knowledge about test-administration and scoring, and interpretation of the obtained results, 6. To enable the students to undertake an independent small-scale research project. 	<p>Understand and apply basic research methods, including research design, data analysis, and interpretation.</p> <p>Experimental psychology training programs are designed to help you develop strong ... to improve the learning process for all students (healthy, ill and delayed and disabled). You can perform research studies and publish your results in scientific and research</p>
7	TYBAS4 Scientific Research and Experimental Psychology(Practical)	<ol style="list-style-type: none"> 1. To familiarize the students with the use of elementary statistical techniques, 2. To give practical experience to the students in administering and scoring psychological tests and interpreting the scores, 3. To acquaint the students with the basic procedure and design of psychology experiments, 4. To encourage and guide the students to undertake a small-scale research project. 5. To encourage students to learn practical application through study tour and visit. 	<p>Experimental psychology training programs are designed to help you develop strong ... to improve the learning process for all students (healthy, ill and delayed and disabled). You can perform research studies and publish your results in scientific and research.</p>

8	M.A I Semester I Cognitive Psychology	<ol style="list-style-type: none"> 1. To understand the origin of cognitive psychology 2. To explore the knowledge of cognitive psychology 3. To make students aware with the recent trends in cognitive psychology 4. To help students in relating subject matter of cognitive psychology to daily life. 5. To understand the advances in cognitive psychology 6. To study the application of cognitive psychology in different fields 	<p>The student has knowledge of how human cognition works from attention, sensation, perception, action, language processes, problem solving and thinking to learning and memory.</p> <p>The student has knowledge of the key methods used in modern cognitive psychology research.</p> <p>Skills:</p> <p>The student can analyze and discuss scientific issues within the subject area. The student can express themselves by writing in a way that is appropriate to communicate the essential content of the relevant discipline.</p> <p>General competence:</p> <p>The student has developed a scientific attitude comprising the ability of reflection and logic reasoning.</p> <p>The student has developed an ability of critical thinking including respect for scientific data and ethical values.</p>
9	M A I Research Methodology Semester I	<p>To inform students about the basics of scientific research in applied psychology.</p> <p>To make them learn the statistical rigours in designing research and processing data.</p> <p>To learn about the philosophical foundations, goals and scope of qualitative methodology. To develop an understanding about the relationship between paradigms of science and methods of qualitative inquiry. To understand basic procedures of using qualitative methodology. To learn about scientific rigour in the use of qualitative methodology. To make them learn the statistical rigours in multivariate analysis.</p>	<ol style="list-style-type: none"> 1. Describe key concepts, principles, and overarching themes in psychology. 2. Develop a working knowledge of psychology's content domains 3. Describe applications of psychology 4. Use scientific reasoning to interpret psychological phenomena 5. Demonstrate psychology information literacy 6. Engage in innovative and

			<p>integrative thinking and problem solving</p> <p>7. Interpret, design, and conduct basic</p>
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			psychological research
10	M A I Psychometrics: The Science Of Psycholo gical Assessme nt Semester I	To create critical understanding of measurement issues and techniques in psychological inquiry. To enable students to develop skills and competencies in test construction and standardization. To understand the various biases in psychological testing and assessment. To understand how psychological tests are used for the purpose of assessment, guidance and enhancing the effectiveness of teaching-learning process. To understand the use and interpretation of various psychological tests used in educational field. To understand the use of psychological tests are used for better health, adjustment and related counselling. To understand the use of psychological tests in clinical and organizational settings	To create critical understanding of measurement issues and techniques in psychological inquiry. To enable students to develop skills and competencies in test construction and standardization. To understand the various biases in psychological testing and assessment.
11	M A I Testing Practical Semester I	<ol style="list-style-type: none"> 1. The administration of the standardized psychological tests, rapport establishment, interpretation of scores and report writing. 2. The criteria's of evaluating psychological tests 3. Certain counseling skills on the basis of psychological results 4. The various areas of experimentation in psychology 5. Skills required in conducting experiments in psychology 6. Applications of experimental design and report writing style 	Understand and apply basic research methods, including research design, data analysis, and interpretation.

1 2	M.A I Semester II Cognitive Psychology	<p>7. To understand the origin of cognitive psychology</p> <p>8. To explore the knowledge of cognitive psychology</p> <p>9. To make students aware with the recent trends in cognitive psychology</p> <p>10. To help students in relating subject matter of cognitive psychology to daily life.</p> <p>11. To understand the advances in cognitive psychology</p> <p>12. To study the application of cognitive psychology in different fields</p>	<p>The student has knowledge of how human cognition works from attention, sensation, perception, action, language processes, problem solving and thinking to learning and memory. The student has knowledge of the key methods used in modern cognitive psychology research. Skills: The student can analyze and discuss scientific issues within the subject area. The student can express themselves by writing in a way that is appropriate to communicate the essential content of the relevant discipline. General competence:</p> <p>The student has developed a scientific attitude comprising the ability of reflection and logic reasoning.</p> <p>The student has developed an ability of critical thinking including respect for scientific data and ethical values.</p>
1 3	M A I Research Methodology Semester II	<p>To inform students about the basics of scientific research in applied psychology.</p> <p>To make them learn the statistical rigours in designing research and processing data.</p> <p>To learn about the philosophical foundations, goals and scope of qualitative methodology. To develop an understanding about the relationship between paradigms of science and methods of qualitative inquiry. To understand basic procedures of using qualitative methodology. To learn about scientific rigour in the use of qualitative methodology. To make them learn the statistical rigours in multivariate analysis.</p>	<p>Describe key concepts, principles, and overarching themes in psychology.</p> <p>Develop a working knowledge of psychology's content domains</p> <p>Describe applications of psychology, Use scientific reasoning to interpret psychological phenomena,</p> <p>Demonstrate psychology information literacy, Engage in innovative and integrative thinking and problem solving</p> <p>Interpret, design, and conduct basic</p>

1 4	M A I Psychometrics: The Science Of Psycholo gical Assessme nt Semester II	To create critical understanding of measurement issues and techniques in psychological inquiry. To enable students to develop skills and competencies in test construction and standardization. To understand the various biases in psychological testing and assessment. To understand how psychological tests are used for the purpose of assessment, guidance and enhancing the effectiveness of teaching-learning process. To understand the use and interpretation of various psychological tests used in educational field. To understand the use of psychological tests are used for better health, adjustment and related counselling. To understand the use of psychological tests in clinical and organizational settings	To create critical understanding of measurement issues and techniques in psychological inquiry. To enable students to develop skills and competencies in test construction and standardization. To understand the various biases in psychological testing and assessment.
1 5	M A I Experimental Practical Semester II	7. The administration of the standardized psychological tests, rapport establishment, interpretation of scores and report writing. 8. The criteria's of evaluating psychological tests 9. Certain counseling skills on the basis of psychological results 10. The various areas of experimentation in psychology 11. Skills required in conducting experiments in psychology 12. Applications of experimental design and report writing style	Understand and apply basic research methods, including research design, data analysis, and interpretation.

1 6	M A II Personality and Motivation and Emotion	<p>1. To provide the students with a comprehensive, rigorous and systematic treatment of centrally important theories of personality.</p> <p>2. To allow the students to observe and interpret individual differences in behaviour in the light of sound theoretical systems of personality.</p> <p>3. To acquaint the students with the applications of personality theories in different walks of life.</p> <p>4. To provide comprehensive overview of the major theories of motivation and emotion</p> <p>5. To create awareness about the role of biological factors in motivation and emotion.</p> <p>6. To emphasize the importance of positive and negative emotions in human life.</p>	Understanding personality and implement of personality traits, types and theories of Personality.
1 7	Psychopathology	<p>1. Latest DSM-5 classification system of Mental Disorders</p> <p>2. Various paradigms of Psychopathology</p> <p>3. The symptoms and prognosis of different Mental Disorders</p>	which includes examination, assessment, interpretation, physical diagnosis, planning and execution of treatment and advice to any person for the purpose of preventing, correcting, alleviating and limiting dysfunction, acute and chronic bodily malfunction including life saving measures via chest physiotherapy in the intensive care unit, curing physical disorders or disability, promoting physical fitness, facilitating healing and pain relief and treatment of physical and psychological disorders through modulating psychological and physical response using physical agents,

1 8	Psycho diagnostics procedure and Techniques Psychotherapies	<ol style="list-style-type: none"> 1. Various Psycho diagnostics, procedure & techniques 2. Different Psycho diagnostic tools to be used & skills to be acquired 3. Various Psychotherapies and its basic procedure 4. Effectiveness of specific psychotherapy in solution of particular problem 5. Different psychotherapeutic skills. 	<ol style="list-style-type: none"> 1. Enhance personal and social interactions by using the knowledge of the history and major theories of abnormal behavior. 2. Better understand one's own and others' behavior by applying the knowledge of assessment, diagnosis, classification systems and DSM categories. 3. Become a more effective consumer of and advocate for mental health care services through an understanding of the various approaches to the diagnosis and treatment of psychological disorders.
1 9	Project Semester I	To develop the basic concept of research	<ol style="list-style-type: none"> 1. Written assignments designed to integrate course material into personal experience, such as case studies, reflection paper etc... 2. Attendance at, or participation in lectures, workshops, or other community or campus events related to the field of abnormal psychology. 3. Exams consisting of objective and/or essay questions that require integration, application, and critical examination of course concepts.

20	Practicum Semester II	To develop and understand the diagnosis and pathology of abnormal client	<p>Students will receive a high quality education in the diverse discipline of Psychology, and learn the skills in communication and critical thinking expected of an individual with graduate-level scientific training. American Psychological Association curriculum standards and guidelines are closely followed, along with professional licensing and relevant (e.g., LCAS and BCBA) specializations and certifications. Graduates must complete and defend an empirical thesis.</p> <p>Students are exposed to high-level applied, active learning experiences in psychology involving research and clinical practice. This exposure is established through internships, practicum placements, research practicum, thesis and oral defense, as</p>
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			<p>well as expected participation in scientific meetings and publication.</p> <p>: Graduates are prepared to assume careers in clinical psychology and/or to pursue doctoral training in psychology or related professions/academic disciplines. Data are collected each year as part of program annual report submitted to the Graduate School. Surveys are sent to recent graduates to track their progress in their career goals.</p>
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Course Outcomes
Department of Sociology

Programs offered

Sr. No.	Program	Program Objectives	Program Specific Objectives
1	BA Sociology	PO1.Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.	PSO1.Sociology is a significant area to study and observe the various ethical, moral, and cultural standards and the significant role played by social institutions in regulating the various patterns of individuals in every society.
2	MA Sociology	PO1. It can help get noticed in the job market. In other words, it is likely to enhance career options. 2. It Offers plenty of opportunities to engage with the subject from multiple angles. 3. It can develop advanced analytical skills	PSO1. It can provide training in advanced approaches to social theory and a wide range of quantitative and qualitative research methods. 2. It can develop the capacity to apply contending theories and a variety of methods to empirical research problems. 3. It provides sociological training that is both valuable in its own right and may serve as a stepping stone to subsequent doctoral research.

Courses offered

Undergraduate

Sr. No.	Course	Course Outcomes
1	FYBA General 1- Introduction to sociology (Sem - 1) Social Institutions and Change (Sem- II)	CO1. 1. To introduce Sociology to the students as a major social science. 2.To introduce basic sociological concepts. To get acquainted with the sociological knowledge and social phenomena.

2	SYBA General 2- Population and Society	1.To introduce the significance of population studies and explain theories and basic concepts. 2.To understand the impact of population on various institutions of society. 3. To understand the importance of population studies for policy and development
3	SYBA Special 1- Foundations of Sociological Thought	1.To introduce the students to the works of classical sociologists that shaped the discipline. 2. To expose the students to the processes that shaped the discipline of sociology in India. 3. To familiarize the students to major perspectives and works of some Indian sociologists.
4	SYBA Special 2- Indian Society: Issues and Problems	CO1. 1. To familiarize the students to different social issues and problems. 2. To acquaint the students to the changing nature of social problems in India. 3. To enable students to analyze social issues and problems using different sociological Perspectives.
5	TYBA General 3- Crime and Society	1. To acquaint the students with recent trends in criminology, changing profile of crime and criminals. 2. To prepare the students for professional roles of correctional agents in agencies of criminal justice administration.
6	TYBA Special 3- Social Research Methods1	1.To impart basic research skills. 2. To introduce the students to different procedures in conducting social research. 3. To acquaint the students to different types of research and issues in research. 4. To familiarize the students with Sociological approaches to research
7	TYBA Special 4- Contemporary Indian Society	1. To appreciate the plurality of India, its composite culture and its resilience. 2. To acquaint the students to the issues of contemporary India. 3. To expose the students to the crisis and challenges of contemporary India.

Postgraduate

Sr. No.	Course	Course Outcomes
1.	M.A.I.Sem. I Classical Sociological Tradition	1.To understand the linkage between the social changes that had far-reaching effects on the economic and social systems and the emergence of discipline of Sociology in west and reception of western social thought and link with Indian thought.

		2. To understand the theoretical foundations of Sociology on which edifice of modern sociological theories are erected & to develop critical thinking, analytical ability to interpret the social scenario around them.
2.	Sociology of India	CO1.1.To acquaint the students to the continuities and contradictions in Indian society. 2. To analyze the role of colonialism, democracy, nation building and globalization in shaping contemporary, society in India.
3.	Application of Sociological research methods	1.To introduce the methods in quantitative and qualitative research 2. To enhance the ability of the students to apply the research methods to practical issues 3. To enhance their ability of analysis and presentation of data
4.	Agrarian Society and change in India	1.To introduce students to different approaches to the study of Agrarian Social structure. 2. To understand the contemporary agrarian society and issues in relevant context.
	Sem. II	
5.	Introduction to Sociological Theories	1.To develop the understanding of major sociological perspectives. 2. To develop the analytical abilities of the students. 3. To develop research orientation of the students with the understanding of major theoretical perspectives
6	Methodology of Social Research	1.To introduce students to the philosophical foundations of social research. 2. To acquaint students with the quantitative and qualitative strategies of research.
7.	Sociology of Education	1.To get acquainted with the approaches and contributions in sociology of education 2. To get acquainted with the alternative educational programmers in India
8	Globalization and Labour in India	1. To understand the changing nature of work, labour and work organizations 2. To understand impact of globalization on India's primary, secondary and tertiary sector 3. To understand important concepts and processes in relation to labour studies
	M.A.II.Sem. III	
09	Application of Research Skills	1.To introduce the methods in quantitative and qualitative research 2. To enhance the ability of the students to apply the research methods to practical issues 3. To enhance their ability of analysis and presentation of data
10.	Sociology of Development	1.Concepts related to Development: Introduction to 'development' (origin of term 'underdevelopment', evolution of concept of

		development, evolution of terms such as South, III World, Developing countries), Social Change, Economic Growth, Poverty (Wolfgang Sachs), HDI, MDGs, GDI-GEM-WID-WAD-GAD, Human Development, Social Development, Sustainable Development
11.	Sociology of Gender	1.To introduce the basic concepts of gender and gender inequality 2. To analyze the gendered nature of major social institutions 3. To understand the challenges to gender inequality
12.	Sociology of Disaster and Disaster Management	1.To create awareness regarding disaster and disaster management. 2. To understand the historical development of India's disaster management policy
	M.A.II.SEM.IV	
13	Sociology of globalization	1. To understand the historical process and theoretical perspectives of globalization. 2. To develop a critical understanding of the emerging new processes & consequences in Context of world and India.
14	Contemporary Social Theories / (dissertation)	1.To introduce the students to the contemporary trends in social theory 2. To compare and contrast various theoretical viewpoints
15	Human Rights and Social Justice	1.This course has been specifically designed to address the needs and interests of the students in emerging aspects of applied knowledge in Human Rights and Social Justice. 2. The course will make them capable to link their Sociological knowledge with latest arenas of study of Globalization, Liberal Capitalism and inequalities, contradictions, Imbalances and injustice thereof. 3. To Demonstrate knowledge about alternatives for these contradictions
16	Sociology of Crime	1. Demonstrate knowledge about theoretical perspectives on crime. 2. To make the students acquainted with alternative schemes, policies related with crime 3. To sensitize the students about causes, social dimensions, consequences and measures to control forms of crime

Department of Statistics
Program Outcome
Program: B.Sc. Statistics
(Academic Year 2019-20)

1. Problem Solving Approach :

Students are supposed to do project work in the final year of graduation. There is tremendous scope to develop problem solving ability of the students as they have to identify one real life problems where different Statistical tools and techniques are used.

2. Communications Skills :

While doing these projects, students have to collect real life data from the field. Where they have interaction with different sections of the society which helps in building their communication skills as they have to interact with different type of people like educated, uneducated, labour class , farmers , Government officials ,Professionals like Doctors and Army personnel's etc.

3. Team Work :

These projects have to be carried out in group of four or five students so that develops the skill of working in a team which in turn develop their unity and integrity. During the completion of the project the students who are introvert, start making interaction with their fellow students.

4. Practical Approach :

These projects helps them identify the real problems and apply the appropriate methods that they learn in three years of graduation program.

Program Specific Outcomes :

PSO1 :

Formulation of the real life problem in terms of Statistical Hypothesis, Setting up of suitable null hypothesis and alternative hypothesis. Use of appropriate test to arrive at a valid decision with a fixed probability of committing a error.

PSO2 :

Programming skills are developed in a course "C-Programming ".The programming skills are used for analysis of Statistical data by using Statistical softwares such as R-software

PSO3 :

Designing an experiment for comparison of different types treatments

Example 1 : In agricultural field experiments comparison of different manures ,type of seeds ,irrigation methods etc.

Example 2 :In Clinical trials comparison of different drugs on different group of subjects hailing from different geographical areas .

PSO 4:

To study the relationship between set of independent variables affecting a response variable .Testing significance of each of the independent variables affecting response variable.

PSO 5:

Sample

Surveys : Designing the problem ,Identification of the relevant population ,Determining the sample size with predetermined accuracy ,Use of appropriate sampling method for the selection of sample ,Collection of data and Analysis of the data

PSO6 :

Determination of premium amount for fixed assured sum of benefit for a given duration for different types of insurance policies.

Course Outcome
Department of Statistics
Program : B.Sc. Statistics

Sr. No	Program Objective	Program Specific Objectives
1	<p>PO 1 : Problem Solving Approach</p> <p>Students are supposed to do project work in the final year of graduation. There is tremendous scope to develop problem solving ability of the students as they have to identify one real life problems where different Statistical tools and techniques are used</p>	<p>PSO1 :</p> <p>Formulation of the real life problem in terms of Statistical Hypothesis, Setting up of suitable null hypothesis and alternative hypothesis. Use of appropriate test to arrive at a valid decision with a fixed probability of committing a error.</p>
2	<p>PO 2 Communications Skills :</p> <p>While doing these projects, students have to collect real life data from the field. Where they have interaction with different sections of the society which helps in building their communication skills as they have to interact with different type of people like educated, uneducated, labour class , farmers , Government officials ,Professionals like Doctors and Army personnel's etc.</p>	<p>PSO2 :</p> <p>Programming skills are developed in a course "C- Programming " .The programming skills are used for analysis of Statistical data by using Statistical softwares such as R- software</p>
3	<p>PO 3: Team Work</p> <p>These projects have to be carried out in group of four or five students so that develops the skill of working in a team which in turn develop their unity and integrity. During the completion of the project the students who are introvert, start making interaction with their fellow students.</p>	<p>PSO3 :</p> <p>Designing an experiment for comparison of different types treatments</p> <p>Example 1 : In agricultural field experiments comparison of different manures ,type of seeds ,irrigation methods etc.</p> <p>Example 2 :In Clinical trials comparison of different drugs on different group of subjects hailing from different geographical areas</p>

Sr. No	Program Objective	Program Specific Objectives
4.	PO4 Practical Approach : These projects helps them identify the real problems and apply the appropriate methods that they learn in three years of graduation program.	PSO 4: To study the relationship between set of independent variables affecting a response variable .Testing significance of each of the independent variables affecting response variable.
5.		PSO 5: Sample Surveys : Designing the problem ,Identification of the relevant population ,Determining the sample size with predetermined accuracy ,Use of appropriate sampling method for the selection of sample ,Collection of data and Analysis of the data
6.		PSO6 : Determination of premium amount for fixed assured sum of benefit for a given duration for different types of insurance policies

Courses offered

Classes	Course Course	Outcomes
F.Y. B.S c.	FYBSc Descriptive Statistics -I	Introduction to the analysis of basic Statistical tools of the data such as averages, measures of variations, symmetry , peakedness of the data
	FYBSc Probability Theory and distributions -I	Bivariate data , Karl Pearson's coefficient of correlation ,Spearman's rank correlation , fitting of regression line , non-linear curve fitting ,Theory of index numbers
	FYBSc Descriptive Statistics -II	Introduction to Probability , Discrete probability distributions such as Binomial ,Uniform ,Hypergeometric etc.
	FYBSc Probability Theory and distributions -II	Discrete distributions with countably infinite sample space ,Poisson , Geometric etc. Bivariate probability distributions ,conditional probability distributions and their mathematical expectation. Independence of random variables
S.Y. B.S c.	SYBSc Discrete probability distribution ,R Software and multiple regression	Introduction to time series data ,truncated distributions ,Multiple regression ,Index Numbers , Demography and RSoftware
	SYBSc: Continuous Probability distribution	Introduction to continuous probability distributions such as Uniform, Normal ,Exponential ,Gamma ,Chi-Square ,tDistribution ,F-distribution , Testing of Hypothesis procedure etc
T.Y. B.S c	T.Y.B.Sc Distribution Theory	Introduction to continuous distributions such as Beta ,Weibull ,Cauchy ,Lognormal ,Laplace and Bivariate Normal etc
	T.Y.B.Sc Estimation	Introduction to basics of Statistical inference , Estimation of Parameters by method of moments , method of maximum likelihood . Uniformly minimum variance unbiased estimator ,construction of confidence interval
	T.Y.B.Sc Design of Experiments	Basic principles of designing experiments, randomization, replication,local control. Completely randomized design ,randomized block design, latin square design , post-hoc analysis , factorial design, Analysis of covariance for CRD and RBD
	T.Y.B.Sc.: Sampling Theory	Simple random sampling with replacement /without replacement, Stratified random sampling, proportion allocation ,Neyman allocation, optimum allocation, systematic random sampling, Estimation of population mean , standard error of the estimator ,estimation of standard error . Comparison of estimators of the population mean for these methods . Population with linear trend ,Design of sample surveys

	T.Y.B.Sc.: Programming	C	Introduction to the Basics of C Programming , programs for calculation of arithmetic mean, median ,mode ,Karl Pearson's coefficient of correlation, Karl Pearson coefficient of skewness, Bowleys coefficient of skewness ,fitting of simple linear regression equation
T.Y. B.S c	T.Y.B.Sc.: Regression Analysis		Introduction to simple linear regression analysis, Estimation of parameters by method of least square / maximum likelihood , testing significance of the parameters of the model by t-test ,F-test, confidence interval ,model adequacy checking using R-software. Interpretation of the plots produced by R. Multiple linear regression model, estimation of parameters by least square principle, test of significance of the parameters , construction of the confidence interval , ANOVA table , R -square , Model selection / building methods,forward selection ,backward elimination ,stepwise regression, polynomial regression model ,weighted least square Simple logistic regression model, Estiation of parameters , Interpretation of parameters ,Model deviance. Multiple logistic regression model
	TYBSc Actuarial Statistics		Introduction to the basic terms in actuarial science ,different types of insurances , Estimation of premium for different types of insurances.
	T.Y.B.Sc. : Testing of hypothesis		Most powerful test ,uniformly most powerful tests, likelihood ratio test, sequential probability ration tests, non- parametric tests,Sign test ,Wilcoxon- signed rank test , Mann-Whitney test, Empirical distribution function,Kolmogorov smirnov tests, Run test for testing randomness,
	T.Y.B.Sc Statistical Quality Control	:	Introduction to seven tools , Construction of control chart for variable data ,attribute data , control chart for number of defetcts ,Process capability analysis. Online Process control methods ,offline Process control methods, Single Sampling Plans,double sampling plans ,operating characteristic curves.
	TYBSc Operations Research	:	Introduction to Linear Programming Problem , Transportation Problem , Assignment Problem , Critical Path Methods ,Project Evaluation and Review Technique etc
	T Y B Sc: Survival Analysis I		Introduction to methods of survival analysis data
	TYBSc : R- Software and Programming		Introduction to R-software and Programming for Statistical Analysis of the data.
	TYBSc: Project Work		Identification of real life problem, Collection of Data ,Statistical Analysis of the collected data and Interpretation of the output

Ahmednagar College, Ahmednagar

Department of Zoology

Courses offered at Undergraduate Level (B.Sc. Zoology)

Sr. No.	Program	Program Objectives	Program Specific Outcomes
1.	<p>B.Sc. Zoology</p> <p>Inspire the students for pursuing higher studies in Zoology and for becoming an entrepreneur and also enable students to get employed in the Biological research Institutes, Industries, Educational Institutes and in the various concerning departments of State and Central Government based on subject Zoology.</p>	<ul style="list-style-type: none">- To provide detailed knowledge about the subject and understand its applicability at practical level.- To make students sensitized towards global issues related to Zoology and science in general.- To update students regarding scientific achievements.- To encourage their learning by engaging them with interactive sessions, orals, home assignments, etc.- In addition they are even exposed to study tour, field visit, industrial visit, historic places, museum, zoological park, etc, which further enhances their understanding of the subject.	<ol style="list-style-type: none">1. After completion of the program, students will be a better understanding of the subject.2. Most of the courses taught helps the student to become self-reliant, by starting their own small scale business.3. Students curiosity is nurtured and encouraged them to pursue the subject for PG and PhD.4. After completion of the program, student will have good understanding of his subject and knowledge about other subjects, as the course has interdisciplinary approach. The student will excel in his and any field, he chooses.

Sr. No.	Course	Course outcome
F.Y.B.Sc.		
1.	Animal Diversity- I	<p>1. The student will be able to classify animals following Linnean system of classification, and he will understand the importance of binomial nomenclature and five kingdom system.</p> <p>2. Introduction about Kingdom Animalia and how it is divided further.</p> <p>3. The student will understand the classification of animals into different phyla based on external morphometric characters. E.g. Phylum- Protozoa is divided into many classes based on presence of cilia, flagella, etc. With examples of some useful and harmful protozoans.</p> <p>4. Understand the concept of Metazoa and its origin.</p> <p>5. To study aquatic pore bearing animals, its classification with examples and understand the functioning of canal system.</p> <p>6. To study aquatic cylindrical shaped animal belonging to order Cnidaria and understand its classification with examples.</p> <p>7. To study the parasitic flatworms, its mode of feeding, habit, habitat, diseases caused and its classifications with examples.</p>
2.	Animal Ecology	<p>1. To understand the concept of Ecology and some terms such as biosphere, ecosystem, community, population, etc.</p> <p>2. To study Ecosystem and understand its types, function, structure and composition. Food chain its type, and the flow of energy through it.</p> <p>3. To study the population and its characteristics like density, mortality, etc with respect to animal population.</p> <p>4. In a given community identify the richness, diversity and abundance of a species with examples. Also understand edge effect, ecotone, etc with example.</p> <p>5. To study how animals interact with each other, the competition and association between them with examples.</p>
3.	Animal Diversity- II	<p>1. To study characters and classification of parasites belonging to phylum Aschelminthes. Also understand the mode of infection, damage caused, preventive measure taken against these parasites.</p> <p>2. To study the worms belonging to phylum Annelida, it is classified into many classes including Hirudinea, example Leech.</p> <p>3. To study one of the largest group of animals i.e. phylum Arthropoda, its characteristic, classification in different classes, with examples. Economic importance of Arthropoda which include useful and harmful insects.</p> <p>4. Study of soft bodied animal covered in shell i.e. phylum Mollusca, its characteristics, classification in different classes with examples. Also study economic importance of mollusca.</p>

		5. Study of animals with spine like projections on skin i.e. phylum Echinodermata, its characteristic, classification upto class level with examples. Type study of Sea Star.
4.	Cell Biology	1. To introduce students the basic concepts of Cell biology, understand the difference between prokaryotic and eukaryotic cell. 2. To study different techniques used in cell biology to study cells in details such as microscopy, stains and dyes, micrometry, etc. 3. To study plasma membrane of animal cell, its structure, component, transport across the membrane and different types of junctions. 4. To study nucleus of cell, its structure, composition, chromatin structure and function of nucleus with the help of electromicrograph. 5. To study endomembrane system, its structure, location and function with respect to endoplasmic reticulum, golgi complex, lysosomes and vacuoles. 6. To study mitochondria its ultrastructure, function and importance 7. To study cell division, how it works and its importance. Understand types of cell division and their significance.
5.	Practical	1. To understand the diversity of animals around us and importance of each animals in entire ecosystem. 2. To understand the basis of classification of animals into different phyla and classes and how these characteristics can be studied in animal specimens. 3. To acquire a basic knowledge about ecosystem, its functioning, its types, threats and control measures to preserve our ecosystem 3. To study the basic unit of life, cell and understand the basic difference between plant and animal cell. 4. To obtain technical knowledge to operate microscope and observe cells under it using different stains and dyes, measure the dimensions of cell using knowledge of micrometry.

S.Y.B.Sc.

6.	Animal Diversity- III	1. To understand phylum chordata, its origin, ancestors, characters, and study of classes like Pisces, Amphibia, Reptilia, Aves and Mammalia with examples 2. To understand phylum Protochordata, its characters, and study of two subphylum hemichordata and cephalochordata, with examples. 3. To understand subphylum Vertebrata, its general characters, and study of infraphylum agnatha and gnathostomata with examples. 4. To introduce students to class pisces, its characteristics, and its two class Chondrichthyes and Osteichthyes. Study of types of fins and scales of fishes with examples. 5. Introduce students to class amphibia, its characteristic, and its order Apoda, Urodela and Anura with examples. Study of parental care in fishes 6. Type study of Scoliodon, understanding its food, feeding, habit, habitat, etc and study of different systems like digestive, circulatory, nervous system, etc.
7.	Applied Zoology- I	1. Introduction to Sericulture. Study of its life cycle, types of silk, stages of rearing, equipment required, product, diseases and its control, etc. 2. Introduction to agricultural pest, their identification, nature of damage, host plant, control measures, etc with different examples. Non-insect pest like rats, snails, etc. Type of pest control and understand IPM. Study of different plant protection appliances.

8.	Animal Diversity- IV	<p>1. Introduction to class reptilia with example of Chelone and Calotes. Difference between poisonus and non-poisonus snakes, snake venom, symptoms of bite, treatment with example of Cobra, Rat snake, etc. Desert adaptations of reptiles.</p> <p>2. Introduction to class Aves with examples of Sparrow and Parrot. Flight adaptation in birds. Types of beaks and feet and migration in birds.</p> <p>3. Introduction to mammals with examples of Rat and Rabbit. Egg laying mammals with examples. Aquatic, flight adaptations and cursorial and fossorial adaptations with examples.</p> <p>4. Type study of Rat- classification, habit and habitat. external characters. System study - digestive, respiratory, reproductive, blood vascular and nervous system. Study of sense organs – eye & ear.</p>
9.	Applied Zoology- II	<p>1. Introduction to Apiculture- classificaiton, habit, habitat and types of bees. Study of life cycle, colony, division of labour. Bee behaviour and communication. Beekeeping equipments. Bee behaviour and communication. Managing colony. Bee products and bee diseases.</p> <p>2. Introduction to fisheries- freshwater, marine and brackish water fisheries. Habit, habitat and culturing with example of Rohu, Catla and Mrigal. Harvesting of Harpodon, Mackerel and Pearl oyster. Crafts and Gears with examples of Catamaran, Machwa, Gill net, Dol net, etc. Fish byproducts- fish meal, fish flour, fish liver oil, etc. Fish preservation- chilling, freezing, etc.</p>
10.	Animal Diversity III, IV Practical	<p>1. Study of Protochordata, Aves, Reptiles, Mammals and field visit to pond.</p> <p>2. Study of Sericulture its products, agriculture pest and their control and field visit to Sericulture farm.</p> <p>3. Study of Reptiles, beak and feet modification, type study of rat and field visit to Zoo/ Wildlife park/ Sanctuary.</p> <p>4. Study of Apiculture, beekeeping, equipment, bee products and bee enemies.</p> <p>5. Study of Fisheries, types, setting of aquarium, crafts and gears used and field visit to Apiculture institude/ Fish farm/ Aquarium.</p>
T.Y.B.Sc.		
11.	Animal Systematics & Diversity - V	<p>The student will gain knowledge & understanding about following concepts:</p> <p>1. Type study of Pila globosa- external characters, classification, anatomial study, snense organs.</p> <p>2. Study of Protozoa, Porifera, Colenterata, and Hemichordata.</p> <p>3. Type study of Calotes versicolor- characters, classification, anatomy.</p> <p>4. Comparative anatomy of skin, heart and brain in 5 classes.</p> <p>5. Study of pisces, reptiles and dentition in mammals.</p>
12.	Mammalian Histology	<p>The student will gain knowledge & understanding about following concepts:</p> <p>1. Introduction to histology.</p> <p>2. Tissues and their types.</p> <p>3. Histological study of different organs.</p> <p>4. Study of endocrine glands.</p>
13.	Biological Chemistry	<p>The student will gain knowledge & understanding about following concepts:</p> <p>1. Introduction to basic biochemistry- bonds, ph, properties of water.</p> <p>2. Carbohydrates- types and disseases associated with it.</p> <p>3. Proteins- types, classification, enzyme reactions and clinical significance.</p> <p>4. Lipids- classification and clinical significance.</p>

14.	Environmental Biology and Toxicology	The student will gain knowledge & understanding about following concepts: 1. Introduction to environmental biology. 2. Ecosystem and its types, food chain, food web and food pyramid. 3. Environmental pollution- types, impact and solution. 4. Bioindicators and environmental challenges. 5. Renewable and non-renewable sources. 6. Wildlife conservation and endangered species. 7. Toxicology- types, pesticides, etc.
15.	Parasitology	The student will gain knowledge & understanding about following concepts: 1. Introduction, types, association types. 2. Types of parasites, hosts. 3. Type study of Plasmodium, Entamoeba, Head louse, tick, etc. 4. Control of parasites and endemic diseases.
16.	Cell Biology	The student will gain knowledge & understanding about following concepts: 1. Introduction- cell and its types. 2. Cell organelles like mitochondria, nucleus, etc, structure and function. 3. Cell cycle and cell division 4. Cell ageing, cell death and cancer.
17.	Biological Techniques	The student will gain knowledge & understanding about following concepts: 1. Introduction to solutions, concentration, separation techniques. 2. RBC, WBC and platelet count, tools like microscope, micrometer, etc. 3. Microtechnique- tissue collection, fixation, dehydration, etc. 4. Types of microtomes and knives. 5. Types of stains, staining methods and histochemical staining.
18.	Mammalian Physiology & Endocrinology	The student will gain knowledge & understanding about following concepts: 1. Introduction to physiology and endocrinology 2. Physiological activities- nutrition, circulation, respiration, etc. 3. Hormones involved in reproduction. 4. Clinical significance of endocrinology.
19.	Genetics and Molecular Biology	The student will gain knowledge & understanding about following concepts: 1. Linkages, gene mutations and types, population genetics. 2. Molecular biology- transcription, translation, operon 3. Recombinant DNA technology and its application
20.	Organic Evolution	The student will gain knowledge & understanding about following concepts: 1. Origin of life, theories of evolution. 2. Isolation, speciation and its types, geological time scale. 3. Evolution of man and zoogeographic realms.
21.	General Embryology	The student will gain knowledge & understanding about following concepts: 1. Introduction, theories and concepts of development. 2. Gametogenesis- study of egg and sperm, fertilization and its types. 3. Embryonic development- cleavage, blastula, gastrula, etc. 4. Chick developmental stages.
22.	Medical Entomology	The student will gain knowledge & understanding about following concepts: 1. Entomology types, morphology and anatomy of insects. 2. Social insects, household insects- cockroach, house cricket, etc. 3. Disease causing insects- mosquito, house fly, etc.

23.	Practical I	The student will be able to perform practical based on knowledge of theory: 1. Study of Pila, Calotes, comparative physiology and fish types. 2. Types of tissue, section of organs and blood cells. 3. Block making, sectioning, WBC count, spectroscopy and chromatography 4. Haemin crystal preparation, blood glucose, bleeding time and disorders.
24.	Practical II	The student will be able to perform practical based on knowledge of theory: 1. Working of pH, carbohydrate estimation, isolation of caesin. 2. Freshwater properties, zooplankton, dissolved O ₂ and CO ₂ 3. Polytene chromosome, DNA estimation, and DNA paper model. 4. Types of fossil, animal adaptation, evolution of man, zoogeographic realm
25.	Practical III	The student will be able to perform practical based on knowledge of theory: 1. Life cycle of parasites, study of vectors, rectal parasite. 2. Mitochondria by Janus Green B, mitosis & meiosis, 3. Types of eggs, chick embryology, preparation of chick embryo. 4. Household insects, social insects, temporary preparation of mouthparts.

Ahmednagar College, Ahmednagar.
Department of Physics
Courses offered at Post Graduate Level
M.Sc. Zoology

Sr. No.	Program	Program Objectives	Program Specific Outcomes
1.	M.Sc. Zoology	1. To develop interest amongst the students regarding the subject. 2. To develop a basic understanding of subject which can be applicable other subjects so that the student can excel. 3. The study of zoology includes basic sciences, as well as recent development in the field of sciences. 4. To develop a student who is not only good in his subject knowledge, but should also be caring and concerned towards environmental issues. 5. One of the few courses also include introduction to animals- types, rearing, commercial profitability, etc. This knowledge is applicable and can make student's self reliant.	1. The students pursuing this course would have to develop in depth understanding various aspects of the subject. 2. The working principles, design guidelines and experimental skills associated with different fields of Zoology such as Genetics and Cell Biology, Biochemistry, Molecular Biology, Biostatistics, Bacterial and Phage technology, Biodiversity, Entomology, Physiology, Developmental Biology, Endocrinology, Biochemical Techniques, Animal tissue culture, etc. 3. The student will have necessary skill set and be competent enough to work in the field of teaching, research or industry.

Courses offered

Sr. No.	Course	Course Outcome
M.Sc. 1 Semester- I		
1.	Biochemistry and Biological Techniques	After successfully completing this course, students will be able to: 1. Define basic terms in biochemistry and biochemical techniques. 2. Explain applications of various biochemical techniques. 3. Explain the structure and functions of various biomolecules. 4. Explain the importance of tools & techniques in biology. 5. Illustrate importance of pH, buffer and water in living systems. 6. Illustrate principle, working and applications of basic techniques. 7. Draw structures of various carbohydrates & amino acids. 8. Classify enzymes with examples.
		Biochemical Techniques: 1. Explain importance and applications of techniques. 2. Explain principle and applications of chromatographic techniques. 3. Explain principle, working and applications of electrophoresis. 4. Describe light, electromagnetic spectrum and its application in absorption spectroscopy. 5. Illustrate importance of radioactive compounds and radioactivity. 6. Demonstrate the principle and working of Warburg's apparatus. 7. Demonstrate the principle, working, applications of centrifugation. 8. Justify the applications of radioactivity compounds in biology. 9. Compare the various separation techniques.
2.	Cell Biology and Developmental Biology	Cell Biology: 1. Label the various cell parts 2. Sketch and label various types of cells and cell organelles. 3. Explain carbon as backbone of biomolecules. 4. Explain the ultrastructure and functions of various cell organelles. 5. Explain the concepts of cell signalling. 6. Illustrate the chemistry and organization of cytoskeleton. 7. Illustrate the types, development and causes of tumor. 8. Diagrammatically represent the cell cycle phases and its regulation.
		Developmental Biology: 1. Define the terms in developmental biology 2. Explain significance of model organism for developmental studies. 3. Explain types of eggs, concept of fertilization and cleavage pattern. 4. Explain concept of mesoderm induction and pattern formation. 5. Describe neural competence and induction. 6. Explain the concept of growth and differentiation.

		<p>7. Illustrate postembryonic development.</p> <p>8. Compare and contrast spermatogenesis and oogenesis.</p>
3.	Genetics and English in Scientific Communication	<p>Genetics:</p> <ol style="list-style-type: none"> 1. Define the basic terminologies in genetics. 2. Identify genetic disorders based on Karyotypes and traits. 3. Explain the concept of Mendelian genetics, gene, gene regulation and multiple alleles. 4. Discuss Linkage and crossing with their types and significance. 5. Explain the principles of Population genetics. 6. Illustrate the modified Mendelian laws of inheritance. 7. Justify the inheritance of qualitative and quantitative traits. 8. Solve the problems based on gene frequency.
		<p>English in Scientific Communication:</p> <ol style="list-style-type: none"> 1. Write the outline of a scientific paper. 2. Write title, abstract, discussion & citations of given scientific article. 3. Prepare a scientific presentation using PowerPoint. 4. Explain language as a tool for effective scientific communication. 5. Use the formal elements of specific types of scientific writing. 6. Critically analyze data from research; incorporate it into writing clearly and logically; and attribute the source with citation. 7. Practice the unique qualities of professional rhetoric and writing style, such as sentence conciseness, clarity, accuracy, honesty, etc. 8. Justify importance of plagiarism check and Proof-read given article.
4.	Freshwater Zoology	<ol style="list-style-type: none"> 1: Enlist the diagnostic features of shrimps. 2: Explain the types of aquatic habitats. 3: Discuss the aquatic adaptations of common freshwater forms. 4: Explain the adaptations in freshwater Turtles and Crocodiles 5: Illustrate the physicochemical properties of water. 6: Demonstrate the effect of pollutants on freshwater bodies 7: Justify the presence of zooplanktons and aquatics forms in freshwater bodies.
5.	Practical Freshwater Zoology	<p>After successfully completing this course, students will be able to:</p> <ol style="list-style-type: none"> 1: Identify commercially important freshwater fish. 2: Identify the aquatic adaptations in common freshwater forms. 3: Prepare the culture of Paramecium and Daphnia. 4: Estimate the hardness and chloride content in water samples. 5: Analyze the Zooplanktons from local freshwater bodies. 6: Evaluate the bio-indicators of pollution in freshwater.
6.	Basic Zoology Lab-1	<p>After successfully completing this course, students will be able to:</p> <ol style="list-style-type: none"> 1: Identify stages of chick embryo, cell structures and cell division 2: Identify the grammatical mistakes from the given paragraph and common errors in written and spoken presentations. 3: Write scientific project and research article along with proof reading. 4: Working of different microscopes, colorimetric, spectrophotometric methods, cell fractionation and ligature in Drosophila larvae, 5: Determine the gene distance and order, genotype and phenotype ratios and allelic frequencies from the given data.

		<p>6: Estimate sugar and protein by suitable biochemical method, and isolate protein from biological source.</p> <p>7: Prepare acid and base solutions of desired strength, buffers, bacterial Culture, chick embryo culture and Drosophila culture.</p> <p>8: Prepare temporary slide of cells to demonstrate cell morphology and cell division, giant chromosome and pedigree analysis chart.</p> <p>9: Calculate % retention and % elution of amino acids on given ion exchanger.</p>
M.Sc. 1 Semester- II		
7.	Molecular Biology and Bioinformatics	<p>After successfully completing this course, students will be able to:</p> <p>1: Explain DNA structure & types, topology, Physical properties; chromatin structure and organization.</p> <p>2: Discuss genome organization, DNA and Protein sequencing with their application in evolutionary studies.</p> <p>3: Explain the mobile DNA elements.</p> <p>4: Explain mechanism of DNA damage and repair.</p> <p>5: Illustrate the process of DNA replication, transcription, translation and their regulations.</p> <p>6: Illustrate the database tools with their significance.</p> <p>7: Schematically represent the processes of central dogma.</p> <p>8: Justify the post translational and post transcriptional modifications.</p>
8.	Endocrinology and Parasitology	<p>After successfully completing this course, students will be able to:</p> <p>Endocrinology:</p> <p>1: Discuss the roles of Pituitary gland and pineal body.</p> <p>2: Explain hormonal regulation of biomolecules & mineral metabolism.</p> <p>3: Describe the role of osmoregulatory and gastrointestinal hormones.</p> <p>4: Explain the role of hormones in moulting, change in body colour of crustaceans; yolk synthesis in amphibians; insect development.</p> <p>5: Explain the hormonal regulation of metabolism.</p> <p>6: Illustrate mechanism of hormone action & role of hormone receptors.</p> <p>7: Justify hormones as coordination molecules.</p> <p>8: Justify the significance of biological clocks and rhythms.</p>
		<p>Parasitology:</p> <p>1: Define the terminologies of parasitology.</p> <p>2: Explain the concepts of animal association with examples.</p> <p>3: Describe the role of parasites in public health and hygiene.</p> <p>4: Explain the morphology and life cycle of common parasites.</p> <p>5: Explain pathogenicity and control measures of common parasites.</p> <p>6: Illustrate the process of parasitic infections to human.</p> <p>7: Justify importance of control strategies against parasitic infections.</p> <p>8: Justify the significance of vectors and disease transmission.</p>
9.	Comparative Animal Physiology and Environmental Biology	<p>After successfully completing this course, students will be able to:</p> <p>Comparative Animal Physiology:</p> <p>1: Explain physiology of digestion, respiration, muscle contraction and excretion.</p> <p>2: Describe mechanism of thermoregulation in cold & warm blooded.</p> <p>3: Explain the mechanism of chemical communication in vertebrates.</p> <p>4: Comment on the structure and functions of various sense organs.</p>

		<p>5: Illustrate the concept of osmotic regulation in various animals.</p> <p>6: Compare physiology of regulatory mechanisms in various groups of animals.</p> <p>7: Justify survival strategies of organism in varied climatic conditions.</p> <p>8: Justify the evolution of various life processes in living forms.</p>
		<p>Environmental Biology:</p> <p>1: List the endangered, endemic and extinct animal species of India.</p> <p>2: Identify various types of natural resources, human impact on these resources, and common resource management practices.</p> <p>3: Explain the structure and impact of biogeochemical cycles, ecosystems and energy transformation across trophic levels.</p> <p>4: Describe concepts in population ecology and their significance.</p> <p>5: Discuss environmental hazards and risks and socio-economic implications.</p> <p>6: Illustrate the impact of climate and anthropogenic factors on biodiversity with reference to India.</p> <p>7: Illustrate the wildlife management practices and their significance.</p> <p>8: Analyze the impact of lifestyle on the environment and animal life.</p>
10.	Metabolic Pathways	<p>1: Define basic terminologies of metabolic pathways.</p> <p>2: Explain the laws of thermodynamics, concept of free energy and ATP as currency molecule.</p> <p>3: Describe the Concepts and regulation of metabolism.</p> <p>4: Discuss the oxidation of fatty acids and its significance.</p> <p>5: Illustrate the electron transport chain and oxidative phosphorylation.</p> <p>6: Illustrate the reactions, energetics and regulation of glycolysis, glycogen biosynthesis, TCA cycle, Purine and Pyrimidine metabolism</p> <p>7: Write the general reactions of various metabolic pathways.</p> <p>8: Justify the role of enzymes in metabolism</p>
11.	Practicals in Metabolic Pathways	<p>After successfully completing this course, students will be able to:</p> <p>1: Identify the common diseases caused due to errors in metabolism.</p> <p>2: Explain the principle of Colorimetry and Spectrophotometry.</p> <p>3: Use the basic equipment in biochemistry lab.</p> <p>4: Illustrate the enzyme activity from suitable material.</p> <p>5: Demonstrate effect of various physical and chemical factors on enzyme activity.</p> <p>6: Demonstrate the absorption studies of biomolecules.</p> <p>7: Estimate concentration of cholesterol, uric acid, amino acids and starch.</p> <p>8: Separate biomolecules by chromatographic methods.</p>

12.	Basic Zoology Lab-2	<p>After successfully completing this course, students will be able to:</p> <ol style="list-style-type: none"> 1: Identify the various parasites and parasitic stages of common parasites, nitrogenous wasteproducts of animals, feshwater planktons and slides of endocrine glands. 2: Explain the principle and significance of gonadectomy, thyroectomyand pancreactomy. 3: Demonstrate the role of eye stalk and insulin in sugar level in crab. 4: Demonstrate the retro cerebral complex in cockroach. 5: Demonstrate the RBCs of common vertebrates and effect of various osmolarities. 6: Demonstrate the effect of body size, oxygen consumption and Insulin on aquatic animal. 7: Determine bleeding, clotting time, heartbeat of crab, species richness in selected area, physico- chemical properties of soil and water. 8:Perform Sterilization of lab equipment, prepare microbial culture, Isolate Bacterial, liver DNA and RNA, quantify and resolve them using electrophoretic procedures, analyse protein sample by PAGE and SDS PAGE and construct phylogenetic tree using tools inbioinformatics.
M.Sc. 2 Semester- III		
13.	Animal Physiology- I	<p>After successfully completing this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Explain the membrane physiology and its dynamics. 2. Explain the concept of nutrition and digestion. 3. Explain the structure, contraction and types of contraction of muscle. 4. Illustrate bioluminescence and animal electricity with examples 5. Correlate the organisms Internal and external environments with homeostasis and biological Clocks. 6. Diagrammatically represent the mechanism of respiration, gas exchange and transport of O₂ and CO₂
14.	Entomology- I	<p>After successfully completing this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Define entomology and Insects and understand origin and evolution of insects and its relation to other arthropods. 2. Classification of insects up to family with characters and examples. 3. Explain structure, chemical composition and functions of Integument 4. Explain structure, modifications of insect segment and appendages. 5. Explain Comparative anatomical and histological structure. 6. Explain location structure, functions of endocrine & exocrine glands. 7. Explain location & structure of Light, and sound producing organs.
15.	Genetics- I	<p>After successfully completing this course, students will be able to:</p> <ol style="list-style-type: none"> 1: Define the basic terminologies in Genetics 2: Elaborate the advantages of model organisms used in genetic studies 3: Apply molecular methodologies in genetic analysis 4: Estimate gene frequencies
16.	Fundamentals of Systematics and Economic Zoology	<p>After successfully completing this course, students will be able to:</p> <p>Fundamentals of Systematics:</p> <ol style="list-style-type: none"> 1: Explain principles, methods of classification and diversity in kingdom Animalia. 2: Explain the importance of taxonomic keys and taxonomic characters.

		3: Explain the principles of zoological classification and nomenclature 4: Discuss various taxonomic procedures and molecular phylogenetics & phylogeography. 5: Illustrate the methodologies used in systematics.
		Economic Zoology: 1: Illustrate the lac culture, apiculture, prawn culture, vermiculture, Poultry, dairy industry and Piggery. 2: Explain the role of insects of economic importance. 3: Explain parasitic roundworms of animal and plants. 4: Signify the role of parasitic and soil protozoan in human welfare. 5: Justify the use of animals in pharmaceutical research. 6: Explain coral reef and its significance.
17.	Research Methodology and Insect Physiology and Biochemistry	After successfully completing this course, students will be able to: Research Methodology: 1: Demonstrate knowledge of (reading, evaluating, and developing) 2: Perform literature reviews using print and online databases. 3: Define research problem, parameters to prepare a project proposal. 4: Identify, explain, compare and prepare key elements of research report. 5: Compare and contrast quantitative and qualitative research paradigms 6: Use sampling methods, measurement scales and instruments, and appropriate uses of each. 7: Justify the rationale for research ethics,
		Insect Physiology and Biochemistry: 1: Explain the structure, Chemistry of integument and sclerotization. 2: Describe the process of digestion and metabolism 3: Explain the characteristics of haemolymph and types of haemocytes. 4: illustrate the structure, physiology and biochemistry of flight muscle. 5: Demonstrate process of excretion, detoxification and water balance 6: Justify the role of insect hormones in physiological processes.
18.	Immunology	After successfully completing this course, students will be able to: 1: List the primary and secondary immune organs. 2: Explain concepts of immunity, self-nonsel immune response, autoimmune disease. 3: Explain theories of antibody synthesis and generation of antibody diversity. 4: Explain principle and application of common techniques used. 5: Illustrate the events and dynamics of inflammation 6: Compare the MHC molecules and diseases associated with HLA. 7: Differentiate between active and passive immunization 8: Compare the three pathways of complement fixation pathway.
19.	Practical Paper- 3 Immunology	After successfully completing this course, students will be able to: 1: Identify the pattern of identity of antigen- antibody reaction. 2: Identify the microscopic structure of the lymphoid organs. 3: Demonstrate immunoelectrophoresis technique. 4: Demonstrate the double diffusion techniques. 5: Detect the human blood groups by antigen -antibody reactions

		6: Prepare the human blood smear to identify various blood cells.
20.	Special Lab- 1	<p>After successfully completing this course, students will be able to:</p> <p>Module-I: Animal Physiology-I</p> <p>1: Demonstrate effect of body size and salinity on oxygen consumption.</p> <p>2: Demonstrate effect of starvation on liver and muscle glycogen.</p> <p>3: Demonstrate effect of exercise on breathing, pulse rate and blood lactate level.</p> <p>4: Demonstrate effect of pH, temperature and inhibitors on salivary amylase.</p> <p>5: Map the taste buds on human tongue</p>
		<p>Module-II: Fundamentals of Systematics and Economic Zoology</p> <p>1: Identify museum specimen/pictures of minor phyla, Invertebrates, Protochordates and Vertebrates.</p> <p>2: Identify animals with the help of taxonomic keys.</p> <p>3: Collect and preserve animal samples using common methods.</p> <p>4: Write scientific report of field/ institutional visit.</p> <p>5: Compare the methods of collection and curation of insects.</p> <p>6: Identify the poultry breeds.</p> <p>7: Identify edible freshwater fish from nearby area.</p> <p>8: Demonstrate the apiculture equipment.</p> <p>9: Demonstrate the methods of prawn culture.</p> <p>10: Compare various fishing tools, crafts and gears.</p>
		<p>Module-III: Research Methodology and Insect Physiology and Biochemistry</p> <p>1: Use MS excel in presentation and analysis of data using common statistical tests.</p> <p>2: Suggest a suitable title for a research article.</p> <p>3: Write the abstract, key words, result, discussion, conclusion and citations of references.</p> <p>4: Write a research project to seek funding.</p> <p>5: Conduct a scientific survey.</p> <p>6: Perform protein purification experiment.</p> <p>7: Demonstrate the heart and haemocytes of cockroach.</p> <p>8: Demonstrate the effect of starvation on glycogen in insects.</p> <p>9: Demonstrate the effect of temperature on water loss in cockroach.</p> <p>10: Detect amino acids in insect haemolymph by chromatography.</p> <p>11: Determine the oxygen consumption in dragon fly nymph</p> <p>12: Perform the assay of amylase activity in midgut of insect</p>
M.Sc.- 2. Semester: IV		
21.	Animal Physiology- II	<p>After successfully completing this course, students will be able to:</p> <p>1: Explain composition of blood, types of blood cells and clotting.</p> <p>2: Illustrate the anatomy and physiology of heart and cardiac cycle</p> <p>3: Describe excretory system, nitrogenous wastes and renal regulation</p>

		<p>4: Illustrate osmoregulatory mechanism in Invertebrates and Vertebrates</p> <p>5: Discuss the neuronal physiology and various potentials.</p> <p>6: Justify location and structure of eye, ear & taste buds to its functions.</p> <p>7: Justify energy utilization in physiological and metabolic activities.</p>
22.	Entomology- II	<p>After successfully completing this course, students will be able to:</p> <p>1: Explain Gametogenesis, Fertilization and oviposition.</p> <p>2: Explain embryonic developmental stages such as Cleavage, Blastoderm and Germ band formation; Gastrulation, Blastokinesis, etc.</p> <p>3: Explain post-embryonic developmental stages such as Nymph, Naiad, larva, Pupa and Metamorphosis.</p> <p>4: Explain specialized reproductive mechanisms.</p> <p>5: Explain Hadorn's experiments with imaginal disc, Regeneration and Aging.</p> <p>6: Occurrence, Initiation, Preparations for diapauses and its Controls.</p>
23.	Genetics- II	<p>After successfully completing this course, students will be able to:</p> <p>1. To solve numeric problems based on Mendelian genetics</p> <p>2. Stud of human genetics- pedigree construction, dominant and recessive traits, sex-linked inheritance.</p> <p>3. Explain monogenic diseases, disorders of carbohydrate, lipid, etc.</p> <p>4. Explain diseases related to blood.</p> <p>5. Understanding epigenetics concepts and application.</p> <p>6. To learn different mapping methods.</p> <p>7. Explain oncogenes and tumour suppressor gene</p> <p>8. Explain behavioural genetics with examples.</p> <p>9. Explain circadian rhythm and diseases associated with it.</p> <p>10. Drosophila segmentation genes.</p>
24.	Mammalian Reproductive Physiology and Aquaculture	<p>After successfully completing this course, students will be able to:</p> <p>Mammalian Reproductive Physiology:</p> <p>1: Explain male & female reproductive systems and characters.</p> <p>2: Explain the sexual cycles with examples</p> <p>3: Illustrate the reproductive dysfunctions.</p> <p>4: Diagrammatically represent the hormonal regulation of reproductive processes like pregnancy, lactation and parturition.</p> <p>5: Prepare the flow chart to demonstrate the hormonal coordination of reproductive Processes</p> <p>6: Justify the artificial control of reproduction.</p>
		<p>Aquaculture:</p> <p>1: Identify the fish diseases and the causative organisms</p> <p>2: Mention various composite fish culture with significance of each.</p> <p>3: Describe methods of freshwater prawn culture and its management.</p> <p>4: Explain the methods of pearl culture and pearl harvesting.</p> <p>5: Illustrate the preparation and management of fish culture ponds.</p> <p>6: Demonstrate methods of packaging, transport of fish and brood fish.</p> <p>7: Illustrate techniques of fish harvesting, preservation & processing.</p> <p>8: Compare the techniques used in fishery development.</p>

25.	Histology and Histochemistry	<p>After successfully completing this course, students will be able to:</p> <ol style="list-style-type: none"> 1: Explain the fundamental tissues in details. 2: Describe the process of histological preparations. 3: Illustrate the tools used in histological preparations. 4: Use of stains, dyes used in histochemical detection of biomolecules. 5: Justify the importance of Immunohistochemistry. 6: Draw the structures of various tissues and label them.
26	Pest Control	<p>After successfully completing this course, students will be able to:</p> <ol style="list-style-type: none"> 1: Explain the Pest, nature of damage caused by pests and pest control. 2: Explain medical, veterinary, Household and stored grain pests. 3: Explain methods of pest control including Biological control. 4: Explain the Integrated pest management (IPM) 5: Explain the Non- insect pest and their control: Rat, Bandicoots, Crabs, Snails, Slugs, Birds and Squirrels. 5: Explain the principle and working of pesticide appliances.
27.	Practical Paper- IV	<p>Animal Physiology- II</p> <ol style="list-style-type: none"> 1: Determine the bleeding and clotting time of human blood. 2: Demonstrate the invertebrate heart. 3: Calculate the heartbeats of Daphnia/Drosophila larva. 4: Determine serum urea & protein and glucose in human blood and urine. 5: Effects of physical and chemical factors on frog heart and muscle. <p>Entomology- II</p> <ol style="list-style-type: none"> 1: Identify histological structure of male & female reproductive system. 2: Identify the eggs of different insects. 3: Identify the different embryonic stages of insects. 4: Identify the different post-embryonic stages of insects. 5: demonstrate various body organs, systems and appendages of housefly and butterfly.
		<p>Histology and Histochemistry:</p> <ol style="list-style-type: none"> 1: Identify the various tissues with the help of permanent slides. 2: Demonstrate the effect of fixatives on tissues. 3: Detect the biomolecules with histochemical staining methods. 4: Sketch and label the microscopic details of tissues. 5: Prepare the permanent histological slides.
		<p>Pest Control:</p> <ol style="list-style-type: none"> 1: Identify beneficial and harmful insects. 2: Identify pest of agricultural, veterinary and public health importance. 3: Effects of contact insecticides & fumigants on behavior of insect. 4: Determine the LD50 5: Behavior of insects to repellants and attractants. 6: Know the principle and working of pesticide appliances. 7: Identify and know the role of biological controlling agents. 8: Know the non-insect pests.
28.	Pollution Biology	<p>After successfully completing this course, students will be able to:</p> <ol style="list-style-type: none"> 1: Explain the organization of biosphere. 2: Explain in details the types of pollution. 3: Describe the pollution monitoring strategies. 4: Illustrate the bioassay methods.

		<p>5: Elucidate the methods to study the impact of pollutants.</p> <p>6: Justify the importance of biomedical waste management.</p>
29.	Apiculture	<p>After successfully completing this course, students will be able to:</p> <p>1: Explain the basic concepts of apiculture like systematics, colony organization, polymorphism, morphology and foraging.</p> <p>2: Explain the tools and management of apiary.</p> <p>3: Explain the importance of institutions pertinent to apiculture.</p> <p>4: Discuss the setup of beekeeping business.</p> <p>5: Illustrate the bee keeping as occupation.</p> <p>6: Justify the presence of bees to increase the agriculture productivity.</p>
30.	Practical Paper- V	<p>After successfully completing this course, students will be able to:</p> <p>Mammalian Reproductive Physiology:</p> <p>1: Identify the histological slides of reproductive organ/tissues.</p> <p>2: Explain the various types of placenta in mammals.</p> <p>3: Comment on merits and demerits of contraceptive devices/methods.</p> <p>4: Illustrate the technique of gonadectomy.</p> <p>5: Perform vaginal smear to identify phases of oestrous cycle.</p> <p>6: Male, female anatomical features of reproductive system.</p>
		<p>Aquaculture:</p> <p>1: Identify Indian oysters.</p> <p>2: Identify the common freshwater fish used in culture farming.</p> <p>3: Demonstrate the processing and storing methods for fish and prawn.</p> <p>4: Test the freshness of fish/prawn by histological methods.</p> <p>5: Test the freshness of fish/prawn by biochemical methods.</p> <p>6: Prepare the culture of Daphnia and rotifers.</p> <p>7: Estimate the productivity of water bodies.</p>
		<p>Pollution Biology:</p> <p>1: Identify the bioindicators from given water sample.</p> <p>2: Write a report on eutrophication of water body.</p> <p>3: Determine the LC50 value for the given compound</p> <p>4: Determine the biomass of given sample.</p> <p>5: Analyze pH and salinity of given sample.</p> <p>6: Estimate calcium and magnesium, sulphate from polluted water.</p>
		<p>Apiculture:</p> <p>1: Identify the honey bees</p> <p>2: explain the bee morphology and behaviour</p> <p>3: Illustrate the bee enemies</p> <p>4: Justify the rearing techniques and bee management</p>