Anjuman Khairul Islam's
POONA COLLEGE
OF ARTS, SCIENCE & COMMERCE
• Affiliated to Savitribai Phule Pune University: ID No PU/PN/ASC/023/1970
• UGC - 2(f) & 12 (B) Status • DST - FIST Funded College
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CRITERION -II	
KEY INDICATOR	2.6 - Student Performance and Learning Outcomes
METRIC NO.	2.6.1

Programme and course outcomes for all Programmes offered by the institution are stated

Copies of POs and COs of all Departments

2023-24

Table of Contents

Name of the Programme: B.A. English

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I & II				
F.Y.B.A.	1017	Compulsory English	**CO1**	The course will develop overall linguistic competence and communicative skills of the students
			CO2	They will get exposure to native cultural experiences and situations in order to develop humane values and social awareness.
			CO3	Students will become familiar with excellent pieces of prose and poetry in English realizing the beauty and communicative power of English.
F.Y.B.A.	1337	Optional English I	**CO1**	The students will get exposed to the basics of English literature and language.
			CO2	They will get acquainted with different types of literatures in English, the literary devices and terms so that they can understand the literary merit, beauty and creative use of language.
			CO3	The learners will be introduced to the basic units of language so that they become aware of the technical aspects and their practical usage.
			CO4	They will develop interest in pursuing detailed study and understanding of literature and language.
			CO5	Students will develop an integrated view of language and literature.
SEMESTER III & IV				
S.Y.B.A.	2017	Compulsory English	**CO1**	Students will develop competence and will be motivated for self-learning.
			CO2	Students will be exposed to a wide plethora of prose and poetry in English so that they develop an aesthetic sense and communicative power of English.
			CO3	Students will develop interest in reading literary works .
			CO4	Students will develop overall linguistic competence and communicative skills.
S.Y.B.A.	2337	General English II	**CO1**	Students will be exposed to the elements of short story as a literary genre.
			CO2	It will lead to getting acquainted with

				different types of short stories in English.
			CO3	Students will be exposed to the literary merit, beauty and creative use of language.
			CO4	Students will learn the synchrony between language and literature.
S.Y.B.A.	2338	Special English I	**CO1**	Students will comprehend Drama more effectively through mastery over the literary terminologies related to Drama (i.e. the terms used in Critical Analysis and Appreciation of Drama).
			CO2	The students will be motivated to make a detailed study of a few sample masterpieces of English Drama from different parts of the world.
			CO3	A keen interest will be developed in the students to appreciate and analyze drama independently.
			CO4	Students will be exposed to the aesthetics of Drama and acquire the skill to evaluate drama independently.
S.Y.B.A.	2339	Special English II	**CO1**	Students will get acquainted with the terminologies involved in criticism of poetry (i.e. the terms used in critical analysis and appreciation of poems).
			CO2	Students will obtain the skill to pursue a detailed study of a few sample masterpieces of English poetry.
			CO3	Students will be exposed to the aesthetics of poetry – to read, appreciate and critically evaluate the poetry independently.
SEMESTER V & VI				
T.Y.B.A.	3017	Compulsory English	**CO1**	Students will be exposed to a variety of literary pieces which will develop their interest in Literature
			CO2	Students will be exposed to different nuances of Prose as well as poetry
			CO3	Students will learn elements of Prose and Poetry
			CO4	Students will learn human values through the morals depicted in the literary pieces.
			CO5	Students will become competent users of English in real life situations.
			CO6	Students will be exposed to varied cultural experiences through literature.
			CO7	Students will develop communicative competence and interpersonal skills

				through training in soft skills.
			CO8	Students will get oriented to creativity in language in literature
T.Y.B.A.	3337	General English III	**CO1**	Students will experience how Indian English poetry expresses the ethos and culture of India.
			CO2	Students will be exposed to creative uses of language in Indian English Poetry.
			CO3	Students will be exposed to some of the best samples of Indian English Poetry
			CO4	Students will learn to penetrate into advanced areas of language study.
T.Y.B.A.	3338	Special English III	**CO1**	Students will get acquainted with the basics of novel as a literary form.
			CO2	Students will learn different types, elements or aspects of a novel as a genre.
			CO3	Students will get exposed to the historical development and nature of novel as a literary form.
			CO4	It will lead to attaining a literary sensibility and sense of cultural diversity in students.
			CO5	Human values will be imbibed in the students through the morality generated through literature.
			CO6	Students will get acquainted to some of the best novels in English.
			CO7	Students will develop interest in reading eventually leading to development of reading skills which is an integral part of language learning.
T.Y.B.A.	3339	Special English IV	**CO1**	Students will be exposed to the basics of literary criticism.
			CO2	Students will become aware of the nature and historical development of criticism.
			CO3	Students will become familiar with significant critical terms, approaches and schools of thought related to Criticism.
			CO4	Students will be stimulated to interpret literary works in the light of the critical approaches.
			CO5	Students will develop aptitude for critical analysis.

MA Part I Semester I & II (COURCE OUTCOME) NEP 2020

1. ENG1.1 & 2.1 PAPER 1

Background to English Literature

CO1) Introduce major movements in literature of the world.

CO2) Enhance & reinforce understanding of the texts.

CO3) Integrate knowledge of the diversity of cultures and people.

CO4) Connect the timeline of literary history.

CO5) Know the impact that literature has on cultural, historical, social, psychological and political change.

2. ENG1.2 & 2.2 PAPER 2

English Literature-1 (The Renaissance Period and the Neoclassical Period)

CO1) understand the major trends in the Renaissance period and the Neoclassical period.

CO2) appreciate and analyze the literary nuances in the prescribed works.

CO3) critically analyze the prescribed texts from different perspectives.

CO4) apply the knowledge of values, culture and human relations in everyday life.

CO5) explore the possibilities of research in English literature.

3. ENG1.3 &2.3 PAPER 3

Advanced Studies in English Language

CO 1 acquire the basic tools essential for a systematic study of language,

CO 2 learn advanced theories or concepts in linguistics,

CO 3 understand the phonological, morphological, lexical, and syntactic systems of the English language,

CO 4 know various varieties of English,

CO 5 understand the aspects of language planning, maintenance and language shift,

C0 6 acquire advanced concepts in Pragmatics,

CO 7 know the nature of Stylistics and its relation to/with literary criticism, and

CO8 conduct discourse and stylistic analysis of a text.

4. ENG1.4 & 2.4 PAPER 4

Literary Criticism and Theory

CO1) remember the critical thinkers or philosophers and their seminal works

CO2) understand the significance of major critical theories

CO3) analyze the themes and structure of literary works

CO4) examine dominant ideologies in a literary work

CO5) evaluate a literary work using a theoretical framework

5. ENG 1.5 C (SEM 1) PAPER 5

Critical Reading

CO1. know the concept of Reading and different types of reading

CO 2: understand different theories of reading.

CO3. comprehend how to read the text in meaningful way

CO4. acquire different reading skills

CO5. understand shifts in reading with the advent of digital technology

5. ENG 2.5 C (SEM 2) PAPER 5

Academic Writing

CO1. get acquainted with the concepts of academic writing

CO2 write formal and academic proposals,

CO3 acquire skills to present their research findings in a clear and structured manner and

CO4 understand the shifts in writing practices with the advent of digital technology and the formation of digital literacy.

6. ENG 1.6 PAPER 6

Research Methodology

CO1. know the concept of Research

CO2. comprehend the significance of Research

CO3. analyze and identify the Research problem

CO4. understand different tools and techniques of Research

CO5. frame a Design for the Research

POSTGRADUATE PROGRAMME SPECIFIC OUTCOMES M.A.

Name of the Programme: M.A. English (NEP2020

PSO1	The rationale for studying Literature in English is that it primarily reinforces the guiding principles for education reform outlined in the UGC guidelines.
PSO2	The Literature component in English Curriculum will provide learners with learning experiences to appreciate and enjoy literature, encourage self-expression and creativity, enhance their critical and analytical skills, improve their competence in the use of English, develop their cultural understanding as well as positive values and attitudes conducive to lifelong learning, and prepare them for further study or work.
PSO3	Learners will be enabled to appreciate and enjoy a wide range of literary or creative texts and to appreciate other related cultural forms.
PSO4	The curriculum will help learners to develop a humanistic outlook of life.
PSO5	Through a close interaction with literary/creative works, which portray a range of human thoughts, emotions and experiences, learners will gain knowledge and an understanding of the nature of human existence and of the world.
PSO6	Through Indian Writing in English students will be exposed to the rich cultural heritage of Indian literary tradition as it adopts various literary forms and also addresses different issues.
PSO7	Applied Linguistics aims to focus on practical aspects of language so students will be enabled to understand the social dimensions of not only English but also their own languages
PSO8	American Literature will provide students a general introduction to the major texts that led to the evolution of American literature as an independent branch of literature in English.
PSO9	World Literature in English will offer students glimpses of the representations of cultural diversities and technical experiments that the authors try to project in the selected works.

SEMESTER III				
M.A. II	30601	Paper 3.1 Indian Writing in English	**CO1**	Students will be introduced to the various phases of the evolution in Indian Writing in English. (i. e. the major movements and figures of IWE).
			CO2	Students will be made aware of Indian cultural ethos and indigenous belief systems through the study of major literary works in the domain of Indian English literature.
			CO3	The course will acquaint students with the writings of different Indian writers and help them appreciate the variety and diversity of Indian Writing in English.
			CO4	Students will be exposed to the corpus of Indian Writing in English.
			CO5	Students will develop the ability to critically examine and restate their understanding of literary texts.
			CO6	Students will be exposed to the uniqueness of artistic and innovative use of the English language in IWE and develop literary and linguistic competence
M.A. II	30602	Paper 3.2 Applied Linguistics	**CO1**	Students will be introduced to the field of Applied Linguistics.

			CO2	It will help students understand how descriptive linguistics can be used practically to explain the behavioral and social use of language, especially with regard to language acquisition, second language acquisition/learning, language teaching methodology, etc.
			CO3	Students will understand the correlation between the evolution of linguistic theory and the corresponding developments in the field of language learning and teaching.
			CO4	It will enable students to understand the relationship between language learning theories, teaching methods, production of course materials and language testing.
			CO5	Students will be introduced to the relation between language and culture.
			CO6	Students will understand how linguistic concepts can be applied to the study of literature.
			CO7	It will familiarize students with the tools of language that may use in translation, textual analysis, etc.
M.A. II	30606	Paper 3.6 American Literature	**CO1**	Students will be introduced to the major texts that led to the evolution of American literature as an independent branch of literature in English.
			CO2	It will familiarize students with the issues and problems America has gone through and how they find expression in American literature.
			CO3	Students will gain a broad historical view of the entire period from the time of the early settlers, through the westward movement to the contemporary period.
			CO4	Students will be exposed to religious, socio-political, literary and cultural movements in America.
			CO5	Students will become aware of the major conflicts, struggles and movements that are closely connected with the experiences of a group of people struggling to establish their space within the nation.
			CO6	Students will be acquainted with the rich diversity of American writing.

			CO7	It will enable students to undertake research of a comparative nature to discover similarities between the socio-political, cultural and literary issues pertaining to America and India.
M.A. II	30608	Paper 3.8 World Literature in English	**CO1**	Students will be introduced to some of the important literary texts of the world.
			CO2	Students will gain insight into the socio-cultural aspects of the regions from where the texts are chosen.
			CO3	It will enable students to compare the authors of the world with Indian writers in English or the writers in their own languages.
			CO4	Students will be introduced to the various techniques employed by the authors and will learn how the techniques are adapted/adopted by Indian authors.
			CO5	It will help the students to delve into research in comparative literature.
SEMESTER IV				
M.A. II	40601	Paper 4.1 Indian Writing in English	**CO1**	Students will be introduced to the various phases of the evolution in Indian Writing in English. (i. e. the major movements and figures of IWE).
			CO2	Students will be made aware of Indian cultural ethos and indigenous belief systems through the study of major literary works in the domain of Indian English literature.
			CO3	The course will acquaint students with the writings of different Indian writers and help them appreciate the variety and diversity of Indian Writing in English.
			CO4	Students will be exposed to the corpus of Indian Writing in English.
			CO5	Students will develop the ability to critically examine and restate their understanding of literary texts.
			CO6	Students will be exposed to the uniqueness of artistic and innovative use of the English language in IWE and develop literary and linguistic competence
M.A. II	40602	Paper 4.2 Applied Linguistics	**CO1**	Students will be introduced to the field of Applied Linguistics.
			CO2	It will help students understand how

				descriptive linguistics can be used practically to explain the behavioral and social use of language, especially with regard to language acquisition, second language acquisition/learning, language teaching methodology, etc.
			CO3	Students will understand the correlation between the evolution of linguistic theory and the corresponding developments in the field of language learning and teaching.
			CO4	It will enable students to understand the relationship between language learning theories, teaching methods, production of course materials and language testing.
			CO5	Students will be introduced to the relation between language and culture.
			CO6	Students will understand how linguistic concepts can be applied to the study of literature.
			CO7	It will familiarize students with the tools of language that may use in translation, textual analysis, etc.
M.A. II	40606	Paper 4.6 American Literature	**CO1**	Students will be introduced to the major texts that led to the evolution of American literature as an independent branch of literature in English.
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				research of a comparative nature to discover similarities between the socio-political, cultural and literary issues pertaining to America and India.
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			CO2	Students will gain insight into the socio-cultural aspects of the regions from where the texts are chosen.
			CO3	It will enable students to compare the authors of the world with Indian writers in English or the writers in their own languages.
			CO4	Students will be introduced to the various techniques employed by the authors and will learn how the techniques are adapted/adopted by Indian authors.
			CO5	It will help the students to delve into research in comparative literature.

Name of the Programme: B.A. Economics

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
F.Y.B.A.	G1	Indian Economic Environment	**CO1**	To familiarize the students with the recent developments in the Indian Economic Environment.
			CO2	To provide deep knowledge of the Indian Economy with focus on contemporary issues like economic environment, industrial environment etc.
			CO3	To help the students to prepare for varied competitive examinations
SEMESTER II				
			CO1	To enable students to understand and comprehend the current service sector scenario, and other sectorial growth in the Indian context.
			CO2	To make the student aware of the developments such as MSMEs, Digital Economy, E-Banking, BPO & KPO, etc.
			CO3	To familiarize the students with the recent developments in the Indian Economy.
SEMESTER III				
S.Y.B.A.	G2	Financial System-I	**CO1**	To understand fundamentals of modern financial system.
			CO2	To understand the recent trends and developments in banking system.
			CO3	To understand the role of the Regional Rural Banks and Co-operative Banks..
			CO4	To provide the knowledge of Indian Money Market and Capital Market and Foreign Exchange market.
			CO5	To provide the students the intricacies of Indian financial system for better financial decision making.
S.Y.B.A.	DSE-IA	Micro Economics	**CO1**	To develop an understanding about subject matter of Economics.
			CO2	To impart knowledge of microeconomics.
			CO3	To clarify micro economic concepts and

				to analyse and interpret charts, graphs and figures
			CO4	To develop an understanding of basic theories of micro economics and their application.
			CO5	To help the students to prepare for varied competitive examinations.
S.Y.B.A.	DSE-2A	Macro Economics-I	**CO1**	To introduce students to the historical background of the emergence of macroeconomics.
			CO2	To familiarize students with the differences between microeconomics and macroeconomics.
			CO3	To familiarize students with various concepts of national income.
			CO4	To introduce the concept of classical and Keynesian theories of Output and Employment.
SEMESTER IV				
S.Y.B.A	G2	Financial System-II	**CO1**	To understand role of Reserve Bank of India in modern financial system.
			CO2	To provide the students the intricacies of Indian financial system for better financial decision making.
			CO3	To understand the role of International Financial Institutions like IMF, World Bank and Asian Development Bank and BRICS Bank.
			CO4	To provide the knowledge of various financial and non-financial institutions.
			CO5	To understand the recent trends and developments in banking system.
S.Y.B.A	DSE-1B	Micro Economics-II	**CO1**	To develop an understanding about subject matter of Economics.
			CO2	To impart knowledge of various cost and revenue concepts.
			CO3	To develop an understanding of basic of market structure and their application.
			CO5	To develop an understanding of theories of rent, wages and interest that will usually be applied to real-life situations.
			CO5	To help the students to develop an understanding of welfare economics.
S.Y.B.A	DSE-2B	Macro Economics-II	**CO1**	To introduce students to the concept of money.
			CO2	To familiarize students about the of

				inflation and measures to control inflation
			CO3	To introduce the relation between inflation and unemployment: Philips Curve
			CO4	To help the students to develop an understanding about the business cycle and its concepts
			CO5	To understand the macroeconomic policies for smooth functioning of economic system..
SEMESTER V				
T.Y.B.A.	G3	Indian Economic Development-I	**CO1**	The Study of Economic Development has gained importance because of stained interest of the developing countries in uplifting their economic conditions by restructuring their economics to acquire greater diversity, efficiency and equity,For this and other reasons, their have been many approaches to economic development.
			CO2	In recent times, besides hard core economic prescriptions to development, concern hitherto relegated to background, like education, health, sanitation and infrastructural development, have found place of pride in explaining the preference of various economies incorporated in this paper are devoted to the theories of economic development, approaches to economic development, social and institutional aspects of development, constraints on development process, macro economic policies, roll of foreign capital and economic planning etc. in developing countries.
T.Y.B.A.	S3	International Economics-I	**CO1**	This course provides the students a thorough understanding and deep knowledge about the basic principles that tend to govern the free flow of trade in goods and services at the global level.
			CO2	The contents of the Paper spread over various modules, lay stress both on theory and applied nature of the subject that have registered rapid changes during the last decade. • Besides this, the contents prepare the students to know the

				impact of free trade and tariffs on the different sectors of the economy as well as at the macro level.
			CO3	The students would also be well trained about the rationale of recent changes in the export import policies of India.
T.Y.B.A.	S4	Public Finance-I	**CO1**	The term 'Public Finance' has traditionally been applied to the package of those policies and operations which involve the use of tax and expenditure measures while budgetary policy is an important part to understand the basic problems of use of resources, distribution of Income, etc.
			CO2	There are vast array of fiscal institutions - tax systems, expenditure programs budgetary procedures, stabilization instruments, debt issues, levels of government, etc.
T.Y.B.A.	SEC-3A	Business Management-I	**CO1**	This paper is to train the students to use the techniques of statistical analysis, which are commonly applied to understand and analyze managerial problems.
			CO2	This paper emphasis on understanding the business decision with the help of statistical methods.
			CO3	The paper also deals with various schemes and programs implemented by the government.
			CO4	Leadership Skills- Ability to work in teams at the same time, ability to show leadership qualities
SEMESTER VI				
T.Y.B.A.	G3	Indian Economic Development-II	**CO1**	The Study of Economic Development has gained importance because of stained interest of the developing countries in uplifting their economic conditions by restructuring their economics to acquire greater diversity, efficiency and equity,For this and other reasons, their have been many approaches to economic development.
			CO2	In recent times, besides hard core economic prescriptions to development, concern hitherto relegated to background,

				like education, health, sanitation and infrastructural development, have found place of pride in explaining the preference of various economies incorporated in this paper are devoted to the theories of economic development, approaches to economic development, social and institutional aspects of development, constraints on development process, macro economic policies, roll of foreign capital and economic planning etc. in developing countries.
T.Y.B.A.	S3	International Economics-II	**CO1**	This course provides the students a thorough understanding and deep knowledge about the basic principles that tend to govern the free flow of trade in goods and services at the global level.
			CO2	The contents of the Paper spread over various modules, lay stress both on theory and applied nature of the subject that have registered rapid changes during the last decade.
			CO3	Besides this, the contents prepare the students to know the impact of free trade and tariffs on the different sectors of the economy as well as at the macro level.
			CO4	The students would also be well trained about the rationale of recent changes in the export import policies of India.
T.Y.B.A.	S4	Public Finance-II	**CO1**	The term 'Public Finance' has traditionally been applied to the package of those policies and operations which involve the use of tax and expenditure measures while budgetary policy is an important part to understand the basic problems of use of resources, distribution of Income, etc.
			CO2	There are vast array of fiscal institutions - tax systems, expenditure programs budgetary procedures, stabilization instruments, debt issues, levels of government, etc.
T.Y.B.A.	SEC-3A	Business Management-II	**CO1**	This paper is to train the students to use the techniques of statistical analysis, which are commonly applied to understand and analyze managerial problems.

			CO2	Students come to know about report writing and presentation skills.
			CO3	The paper also deals with simple tools and techniques, which will help a student in data collection, presentation, analysis and drawing inferences about various statistical hypotheses.

Name of the Programme: M.A. Economics

PROGRAMME OUTCOMES

PO - 1. Knowledge of Economic Theories: Graduates of an M.A. in Economics will possess a strong understanding of economic theories, including microeconomics, macroeconomics, econometrics, and other specialized areas of economics.

PO - 2. Analytical Skills: Graduates will be able to apply economic concepts and theories to analyse real-world economic issues, such as market behaviour, policy implications, and economic trends. They should also be able to critically evaluate economic research and data using statistical and econometric techniques.

PO - 3. Research and Writing Skills: Graduates will have developed advanced research and writing skills, including the ability to conduct independent research, analyse economic data, and communicate their findings effectively through written reports, policy briefs, and other forms of economic writing.

PO - 4. Policy Analysis: Graduates will be able to assess the impact of economic policies on various stakeholders and evaluate their effectiveness in achieving desired outcomes. They should also be able to propose evidence-based policy recommendations to address economic challenges and promote economic growth.

PO - 5. Quantitative Skills: Graduates will develop a strong foundation in quantitative methods, including statistical and econometric techniques, and be able to apply these skills to analyse economic data and conduct empirical research.

PO - 6. Communication Skills: Graduates will be able to communicate complex economic concepts and findings to different audiences, including policymakers, business leaders, and the general public, in a clear and concise manner.

PO - 7. Critical Thinking: Graduates will develop critical thinking skills and be able to analyse economic problems from multiple perspectives, consider trade-offs, and propose innovative solutions based on economic principles and evidence.

PO - 8. Professional Ethics: Graduates will understand and adhere to the professional ethics and standards of the economics, including academic integrity, objectivity, and confidentiality in research and policy analysis.

PO - 9. Professional Development: MA Economics programs often include professional development components, such as internships or seminars, to prepare students for careers in economics.

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
M.A. - I	ECO 501 MJ	Micro Economic Analysis - I	CO 1	Understand the basic principles of micro economics or price theory.
			CO 2	Apply the micro economic concepts in various contexts.
			CO 3	Understand the basic theories in microeconomics such as demand theory, production theory, market structures etc.
			CO 4	Discuss the modern developments in micro economics such as Modern Demand theories, Production theories, social welfare theories, etc.
M.A. - I	ECO 502 MJ	Public Finance - I	CO 1	To develop an ability to understand the changing role of the government and the fiscal functions of the modern governments.
			CO 2	To discuss and deliberate on the concepts and theories in public economies like public policy, principles of taxation, theories of public expenditure, etc.
			CO 3	To improve the level of understanding of various policies in public economics like fiscal policy, taxation policy, public expenditure policy etc.
			CO 4	To know the structure of public expenditure its theories and social cost-benefit analysis.

M.A. - I	ECO 503 MJ	International Economics - I	CO 1	Understand the theoretical concept in international trade.
			CO 2	Analyze international economics with reference to terms of trade, trade policy, trade agreements etc.
			CO 3	Discuss Free Trade & Controlled trade, tariff & non-tariff barriers & its effect.
			CO 4	Explain the role of WTO and changing scenario of International Trade.
M.A. - I	ECO 504 MJP	Modern Banking	CO 1	Understand the fundamentals of modern banking.
			CO 2	Explore the various functions and departments within a bank.
			CO 3	Develop an understanding of different banking products and services.
			CO 4	Acquire practical knowledge of banking operations, including account opening, cash handling, payment processing, and reconciliation
			CO 5	Understand the role of technology in modern banking, including digital banking platforms, financial Technology innovations, and cyber security measures.

			CO 6	Develop critical thinking and problem-solving skills through case studies and real-world scenarios relevant to modern banking.
M.A. - I	ECO 510 MJ	Indian Economic Policy	CO 1	The syllabi equips the students to comprehend and critically appraise current Indian Economic Issues and Identify the concepts and the issues and policies in Economic development.
			CO 2	Demonstrate the various Issues and policies of Infrastructural, Social and Industrial sector of the economy
			CO 3	Exemplify various issues of Agriculture LPG, Infrastructure, Financial and Monetary institutions, Foreign Trade and Fiscal Policy pertaining to India's economic development.
			CO 4	Propose a way in which past policies could have been more effectively applied and examine the consequences.
			CO 5	Appraise the contemporary developments in the Indian as well as International economy.
M.A. - I	ECO 511 MJ	Agricultural Economics	CO 1	To understand the basic concepts of agricultural economics

			CO 2	To develop an understanding of agricultural economics in the theoretical as well as practical context.
			CO 3	To discuss and debate the various issues and challenges faced by agrarianeconomiesw.r.t. Policy, production, productivity, efficiency, employment, etc
M.A. - I	ECO 530 RM	Research Methodology [RM]	CO 1	Understand some basic concepts of research and its methodologies.
			CO 2	Identify appropriate research topics.
			CO 3	Select and define appropriate research problem and parameters.
			CO 4	Organize and conduct research (advanced project) in a more appropriate manner.
			CO 5	Write a research report and thesis.
			CO 6	Write a research proposal
SEMESTER II				
M.A. - I	ECO 551 MJ	Micro Economic Analysis - II	CO 1	Understand the basic principles of micro economics or price theory.
			CO 2	Apply micro economic concepts in various contexts.
			CO 3	Understand the basic Market structure in microeconomics.
			CO 4	Analyse the equilibrium of firm and industry in short and long run in various markets
			CO 5	Discuss the modern developments in micro economics such as Kinky Demand Curve, Game Theory etc.

M.A. - I	ECO 552 MJ	Public Finance - II	CO 1	To develop an understanding of various policies in public economics like fiscal, Policy, public debt policy, fiscal finances, etc.
			CO 2	To help the students to understand the normative public policies and compare it with the policies framed and followed in India.
			CO 3	To impart information to the students about the reforms like taxation reforms in India
			CO 4	To develop an understanding of various aspects of Indian public finance
			CO 5	To understand the concept of public debt and the principle of debt management and repayment
			CO 6	To know the detail about central and states sources of Tax and Non-tax Revenue and the concept of Finance Commission, NITI Aayog, Gender Budget, GST
M.A. - I	ECO 553 MJ	International Economics-II	CO 1	Understand the theoretical concepts of Balance of Payments, exchange rate policies, capital flows, etc
			CO 2	Analyse & Interpret various aspects of Foreign Exchange.
			CO 3	Interpret recent developments and changes in international banking, international banking agreements, International Capital Flows etc.
			CO 4	Explain the role of international economic organization.
			CO 5	Discuss various concepts associated with International Banking.
M.A. - I	ECO 554 MJP	Tools of Economics Analyses	CO 1	Understand and apply key economic concepts and principles to real-world economic scenarios.
			CO 2	Acquire proficiency in collecting, cleaning, and handling economic data for analysis.

			CO 3	Develop data analysis and econometric skills to estimate economic relationships and draw meaningful conclusions.
			CO 4	Apply economic analysis to real-world economic problems and policy challenges.
			CO 5	Analyze market behavior, consumer choices, production, and cost structures using economic models.
			CO 6	Present economic analysis and findings effectively through written reports and presentations.
			CO 7	Enhance critical thinking and problem-solving abilities related to economic issues.
M.A. - I	ECO 560 MJ	Labour Economics	CO 1	This Course will give exposure to the students for theoretical as well as empirical issues relating to the labour market with special reference to India.
			CO 2	This Course covers traditional and contemporary topics in labour economics and aims to encourage the development of independent research interests.
			CO 3	Students will able to understand Issues pertaining to the labour market, wage theories, employment policies trade unions and collective bargaining in the globalized economy have become vitally important for developing countries.
			CO 4	Students will able to understand the labour force is in the unorganized sector and the organized sector is witnessing “Jobless” growth.
			CO 5	Students will develop an understanding of labour as social relations of production that will enable them to locate it in that perspective rather than locating labour simply as a factor of production.

M.A. - I	ECO 581 OJT	On Job Training (Internship)	CO 1	On-the-job training (OJT) is a practical approach to acquiring new competencies and skills needed for a job in a real, or close to real, working environment.
			CO 2	It helps students get direct experience in using tools, software, techniques, or equipment used in a live environment
			CO 3	It will train students to acquire a specific skill set
			CO 4	Students acquire academic knowledge and develop specific skills before graduation. OJT helps them to strengthen these skills and facilitates their career growth.
			CO 5	Besides teaching students how to apply their knowledge and skills, OJT introduces them to the company's core values, mission, and vision.
			CO 6	This will help a student to have hands - on experience of the important aspects of the Special Subject chosen by him / her.

SEMESTER III				
M.A. II	EC-3001	Macro Economics - I	**CO1**	Macroeconomics or aggregative economics analyses and establishes the functional relationship between the large aggregates. The aggregate analysis has assumed such a great significance in recent times that a prior understanding of macroeconomic theoretical structure is considered essential for the proper comprehension of the different issues and policies.
			CO2	Macroeconomics is not only a scientific method of analysis; but also a body of empirical economic knowledge. The paper entitled ―Macro Economic Analysis‖ equips the students at the postgraduate level to understand systemic facts and latest theoretical developments for empirical analysis.
M.A. II	EC-3002	Growth and Development – I	**CO1**	Growth and Development is one of the most important areas of economic exploration in the last 50-60 years. Although relatively recent in origin this subject occupies a significant position in economic theory and practice.
			CO2	India being a developing country, this

				subject becomes extremely relevant for both teachers and students. The syllabus of Semester III includes the evolution of growth models as well as important concepts such as poverty, inequality and population dynamics in the context of developing countries.
M.A. II	EC-3003	Modern Banking	**CO1**	The course intends to make students aware about the changing scenario of the modern banking role, structure, performance and the current problems faced by the banking sector in India and also in the world.
			CO2	It also tries to throw light on the future prospects and role of modern banking sector at the global level.
			CO3	Students are supposed to study the current affairs and events happening in the money market and capital market at the national and international level.
M.A. II	EC- 3004	Demography	**CO1**	The main objective of this paper is to make the students aware of the importance of population in economic development and the various theories that explain the growth of population in a country.
			CO2	The paper also enlightens the students on the quantitative and the qualitative aspects and characteristics of the population through various demographic techniques. In recent times, gender characteristics of the population have acquired importance and these have also been included in the framework of study.
			CO3	Migration and urbanization are the characteristics of structural change taking place in a society. Their study is essential to understand the dynamics of this change. The paper exposes the students to sources of population and related characteristics and also to the rationale, need and evolution of population policy.
SEMESTER IV				
M.A. II	EC-4001	Macro-Economics II	**CO1**	Macroeconomics or aggregative economics analyses and establishes the

				functional relationship between the large aggregates.
			CO2	The aggregate analysis has assumed such a great significance in recent times that a prior understanding of macroeconomic theoretical structure is considered essential for the proper comprehension of the different issues and policies.
			CO3	Macroeconomics now is not only a scientific method of analysis; but also a body of empirical economic knowledge.
			CO4	The paper entitled ―Macro Economics equips the students at the postgraduate level to understand systemic facts and latest theoretical developments for empirical analysis.
M.A. II	EC-4002	Growth and Development –II	**CO1**	Growth and Development is one of the most important areas of economic exploration in the last 50-60 years. Although relatively recent in origin this subject occupies a significant position in economic theory and practice. India being a developing country, this subject becomes extremely relevant for both teachers and students.
			CO2	The syllabus of Semester IV includes the practical aspects of the process of growth and development – including the role of agriculture and industry, external trade and resource mobilization and the role of the state and the markets.
M.A. II	EC-4003	Research Methodology	**CO1**	Students who complete their postgraduation in economics are mentally equipped to pursue research in the same discipline. It is generally accepted that the research is nothing but the extension and application of knowledge in a certain specialized field.
			CO2	Therefore regular and external students who do their post-graduation will be given an opportunity to get exposed to a few elements of social science research.

			CO3	Elementary knowledge of research methodology shall consolidate and deepen their understanding of various branches of Economics.
M.A. II	EC-4005	Economics of Environment	**CO1**	Environment is a part and parcel of living things in general and human beings in particular. Hence for their wellbeing and environmental balance its preservation and protection is of vital importance.
			CO2	Environmental degradation can very badly affect all living things coupled with human beings in particular. Environment can have economic aspects, which are neglected in the studies in main stream economics and its branches.
			CO3	This necessitates studying Economics of Environment as an Elective paper at post graduate level.
			CO4	The prime objective of this paper is to well equip the students regarding economic aspects of Environment and development.

Name of the Programme: B.A. Hindi

Name of the Class	Course Code	Course Title		Course Outcomes
SEMESTER-I				
F.Y.B. A.	11091 A	Vaikalpik Hindi Prashnptra-IA	**CO1**	छात्रों को हिंदी काव्य साहित्य का परिचय देना
			CO2	हिंदी कहानी साहित्य से अवगत कराना
			CO3	हिंदी भाषा द्वारा संवाद कौशल विकसित करना
			CO4	मौलिक लेखन की ओर रुझान बढ़ाना
			CO5	विज्ञापन लेखन कौशल विकसित करना
			CO6	अनुवाद संबंधी जानकारी देना
			CO7	हिंदी कम्पुटिंग का परिचय देना
SEMESTER-II				
F.Y.B. A.	11091 B	Vaikalpik Hindi Prashnptra-IB-G-1	**CO1**	छात्रों को हिंदी काव्य साहित्य का परिचय देना
			CO2	हिंदी कहानी साहित्य से अवगत कराना
			CO3	निबंध लेखन कौशल को विकसित करना
			CO4	छात्रों को विज्ञापन लेखन से अवगत कराना
SEMESTER-III				
S.Y.B. A. G2	230931A	Adhunik Kavya Kahani Tatha Vyavaharik Hindi G-2	**CO1**	छात्रों को काव्य साहित्य से परिचित कराना
			CO2	हिंदी कहानी साहित्य से अवगत कराना
			CO3	छात्रों को हिंदी कारक व्यवस्था समझाना
			CO4	शब्द युग्म का अर्थ लिखकर प्रत्यक्ष वाक्य में प्रयोग समझाना
			CO5	संक्षेपन लेखन का प्रत्यक्ष बोध कराना
			CO6	सर्जनात्मक्ता का विकास कराना
S.Y.B.A. S-1	230911A	Kavya Shastra(Samanya), Spl - 1	**CO1**	भारतीय काव्यशास्त्र का परिचय देना
			CO2	काव्य परिभाषा तत्व आदि अवगत कराना
			CO3	काव्य के तत्व, शब्द शक्तियों का परीचय देना
			CO4	रस का स्वरूप समझाना
			CO5	भारतीय काव्य शास्त्र में रुचि पैदा करना तथा आलोचनात्मक दृष्टि विकसित करना
S.Y.B.A. S-2	23091-2A	Madhyayugin Kavya KahaTatha Upanyas Sahitya, Spl - 2	**CO1**	कबीर के साहित्य का परिचय देना
			CO2	मीराबाई के काव्य से अवगत कराना
			CO3	भारतीय उपन्यास की अवधारणा समझाना
			CO4	उपन्यास कृति का मूल्यांकन कला विकसित करना
			CO5	साहित्य कृतियों में प्रस्तुत जीवन मूल्यों को आत्मविस्तृत करना
S.Y.B.A. SEC	23096	अनुवाद स्वरूप	**CO1**	अनुवाद कौशल से छात्रों को अवगत कराना
			CO2	अनुवाद का स्वरूप समझाना

		एवं व्यवहार	**CO3**	अनुवाद क्षेत्र से परिचय कराना
			CO4	हिंदी से मराठी में प्रत्यक्ष अनुवाद कराना
			CO5	अँग्रेजी से हिंदी-मराठी में अनुवाद कौशल का विकास करना
S.Y.B. A. MIL	23012	MIL (हिंदी भाषा शिक्षण)	**CO1**	छात्रों में हिंदी भाषा श्रवण कौशल विकसित करना
			CO2	छात्रों में हिंदी भाषा संवाद कौशल विकसित करना
			CO3	छात्रों में हिंदी भाषा वाचन कौशल विकसित करना
			CO4	छात्रों में हिंदी भाषा लेखन कौशल विकसित करना
			CO5	हिंदी भाषा विधि तथा भाषा व्यवहार से अवगत करना
			CO6	लघुकथा सृजन कौशल विकसित करना
SEMESTER-IV				
SYBA G-2	24093	Adhunik Hindi Vyangya Sahitya Tatha Vyavaharik Hindi, G-2	**CO1**	छात्रों को व्यंग्य पाठ से परिचित कराना
			CO2	छात्रों को कहानी व्यंग्य पाठ का बोध कराना
			CO3	साक्षात्कार कला से अवगत कराना
			CO4	भाषा का मोबाइल तंत्र समझाना
			CO5	पल्लवन कला से अवगत कराना
SYBA S-1	24091-1B	Sahitya Ke Bhed, Spl - 1	**CO1**	छात्रों को साहित्य के भेद से अवगत कराना
			CO2	छात्रों को पद्य भेद से अवगत कराना
			CO3	महाकाव्य, खंडकाव्य और मुक्तक काव्य का परिचय कराना
			CO4	नाटक का स्वरूप समझाना
			CO5	छात्रों में नाट्य अभिनय की रुचि विकसित करना
SYBA S-2	24093-2B	Madhyayugin Kavya Tatha Natak Sahitya, Spl - 2	**CO1**	रहीम के काव्य का बोध कराना
			CO2	बिहारी के काव्य अभिव्यंजना समझना
			CO3	हिंदी नाटक और रंगमंच से अवगत कराना
			CO4	छात्रों में अभिनय गुण विकसित करना
			CO5	नाट्यालोचन से अवगत कराना
S.Y.B.A. SEC	24096	माध्यम लेखन	**CO1**	छात्रों को माध्यम लेखन से परिचित कराना
			CO2	सृजनात्मक लेखन कौशल विकसित करना
			CO3	माध्यम लेखन से अवगत कराना
			CO4	श्राव्य दृश्य माध्यमों की भाषा से अवगत कराना
S.Y.B. A. MIL	24012	MIL (हिंदी भाषा शिक्षण)	**CO1**	छात्रों में वाक्य के भेद से अवगत करना
			CO2	छात्रों में विशेष प्रकार के वाक्यों से परिचित कराना
			CO3	छात्रों में हिंदी भाषा श्रवण कौशल विकसित करना
			CO4	छात्रों में हिंदी भाषा संवाद कौशल विकसित करना
			CO5	छात्रों में हिंदी भाषा वाचन कौशल विकसित करना
			CO6	छात्रों में हिंदी भाषा लेखन कौशल विकसित करना
			CO7	हिंदी भाषा विधि तथा भाषा व्यवहार से अवगत करना
			CO8	हिंदी काव्य-गीत सृजन कौशल विकसित करना

SEMESTER-V				
T.Y.B.A. G 3	CC-1 E	Kathetar Gadya, G-3	**CO1**	छात्रों को संस्मरण साहित्य से अवगत कराना
			CO2	छात्रों को रेखाचित्र साहित्य से अवगत कराना
			CO3	छात्रों को मूल्यांकन दृष्टि का विकास करना
			CO4	सभा इतिवृत्त लेखन कौशल वृद्धि का विकास करना
			CO5	वार्ता लेखन कौशल दृष्टि विकास करना
T.Y.B.A. S 3	DSE 1 C	Hindi Sahitya ka Eithas-3	**CO1**	हिंदी साहित्य इतिहास लेखन का परिचय देना
			CO2	हिंदी साहित्य इतिहास के कालविभाजन तथा नामकरण का परिचय देना
			CO3	आदिकालीन, भक्तिकालीन, रीतिकालीन प्रमुख साहित्य प्रवृत्तियों, रचनाकारों और रचनाओं से परिचित कराना
T.Y.B.A. S 4	DSE 2 C	Bhasha Vidyan Samayana Parichay, Spl-4	**CO1**	भाषा विज्ञान के स्वरूप का परिचय देना
			CO2	छात्रों को भाषा विज्ञान की व्याप्ति समझना
			CO3	भाषा विज्ञान के अध्ययन की दिशाओं का परिचय देना
			CO4	भाषा विज्ञान के अनुप्रयोगात्मक पक्ष को समझाना
			CO5	साहित्य अध्ययन में भाषा विज्ञान की उपयोगिता समझाना
T.Y.B.A. SEC	SEC 2C	पटकथा लेखन	**CO1**	छात्रों को पटकथा लेखन, अर्थ, परिभाषा से अवगत कराना
			CO2	छात्रों को कथा, पटकथा और संवाद से परिचित कराना
			CO3	छात्रों को ड्राफ्ट बनाने से परिचित कराना
SEMESTER-VI				
T.Y.B.A. G-3	CC1F	Gazal Vidha Aur Patrachar, G-3	**CO1**	छात्रों को गजल साहित्य से अवगत कराना
			CO2	छात्रों को गजलकार के व्यक्तित्व से अवगत कराना
			CO3	छात्रों में मूल्यांकन की दृष्टि का विकास करना
			CO4	छात्रों को सरकारी पत्रलेखन से अवगत कराना
T.Y.B.A. S -3	DSE 1 D	Hindi Sahitya Ka Ithis-(Aadhunik Kal)-S3	**CO1**	आधुनिक काल की पृष्टभूमि से छात्रो को अवगत कराना
			CO2	भारतेन्दु युगीन, द्विवेदी युग के काव्य की विशेषताओं से छात्रों को अवगत कराना
			CO3	आधुनिक काल के रचनाओं और रचनाकारों से परिचित कराना
			CO4	हिंदी गद्य के उद्भव और विकास से छात्रों को अवगत कराना
	DSE 2 D	Hindi Bhasha ka	**CO1**	भाषा विज्ञान के स्वरूप का परिचय देना

T.Y.B.A. S -4		Vikas, Spl-4	**CO2**	छात्रों को भाषा विज्ञान की व्याप्ति समझाना
			CO3	भाषा विज्ञान के अध्ययन की दिशाओं का परिचय देना
			CO4	भाषा विज्ञान के अनुप्रयोगात्मक पक्ष को समझाना
			CO5	साहित्य अध्ययन में भाषा विज्ञान की उपयोगिता समझाना
T.Y.B.A. SEC	SEC 2D	साहित्य और फिल्मान्तर	**CO1**	छात्रों को सिनेमा के स्वरूप से परिचित कराना
			CO2	छात्रों को हिंदी साहित्य और सिनेमा के अन्तः संबंध से परिचित कराना
			CO3	छात्रों को हिंदी उपन्यासों पर आधारित फिल्मों से अवगत कराना

Name of the Programme: B.A. Politics

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
F.Y.B. A.	11161 A	Introduction to Indian Constitution, G-1	**CO1**	To understand political processes and the actual functioning of the political system in India.
			CO2	To acquaint with the important features of the Indian Constitution and basic framework of Indian Government
			CO3	To create awareness about Citizens rights and duties incorporated in Indian Constitution.
			CO4	To grasp & understand the changes and the new trends in Indian Politics, important issues in contemporary Indian Politics.
			CO5	To make awareness about the problems and challenges in Indian politics
SEMESTER II				
F.Y.B. A.	11162 B	Introduction to Indian Constitution, G-1	**CO1**	To understand political processes and the actual functioning of the political system in India.
			CO2	To acquaint with the important features of the Indian Constitution and basic framework of Indian Government
			CO3	To create awareness about Citizens rights and duties incorporated in Indian Constitution.
			CO4	To grasp & understand the changes and the new trends in Indian Politics, important issues in contemporary Indian Politics.
			CO5	To make awareness about the problems and challenges in Indian politics
SEMESTER III				
S.Y.B. A.	23163	An Introduction to Political Science, G-2	**CO1**	To understand the basic concepts of Political Theory
			CO2	To know the evolution and usage of these concepts, ideas and theories with reference to individual thinkers both historically and analytically.

			CO3	To understand the basic concepts, Value and ideologies in Political Science
S.Y.B. A.	23161	Western Political Thought, Spl - 1	**CO1**	To understand the major phases in the evolution of western political tradition – enlighten tradition, Liberal tradition, and Marxist tradition and contemporary tradition.
			CO2	To provide in-depth knowledge about 15th Centuries thoughts and modern thoughts
S.Y.B. A.	23162	Political Journalism, Spl - 2	**CO1**	To acquaint students with the complex relationship between communication, media and politics
			CO2	To introduce the basic concepts and approaches among the students related to modern political analysis and to equip the students with methods of political analysis etc.
			CO3	To acquaint students with the critical appraisal of practices of political image management, campaigns, propaganda and censorship.
SEMESTER IV				
S.Y.B. A.	24163	1.An Introduction to Political Science, G-2	**CO1**	To acquaint the students with the contemporary debates across the ideologies
			CO2	To make students knowledgeable regarding various theories of Political Science
S.Y.B. A.	24161	Western Political Thought, Spl - 1	**CO1**	It provides a foundation to students of Political Science in familiarizing themselves to the Thought & Theory of Western Philosophy
			CO2	It particularly focuses on the evolution of idea and institution of State in the West. It covers ancient, medieval and early modern thinkers
S.Y.B. A.	24162	Political Journalism, Spl - 2	**CO1**	Analyze and report the problems in political science by understanding the political situation of the country.
			CO2	TO acquaint students with Indian Context of political journalism.
			CO3	Use different techniques to gather information in Journalism and report effectively.
SEMESTER V				

T.Y.B.A.	CC-1 E	Modern Political Analysis, G-3	**CO1**	To understand the Modern Political Analysis of power.
			CO2	To understand the basic concepts and to understand different forms of justifications of power and the role of ideologies in this regard.
T.Y.B.A.	DSE 1 C	Public Administration, Spl-3	**CO1**	To understand the discipline, Important Concept of Public Administration
			CO2	To sensitize the students on the changing concerns of Public Administration
T.Y.B.A.	DSE 2 C	International Relations, Spl-4	**CO1**	To identify and conceptualize the Major issues in the International Relations.
			CO2	To identify the major national/international actors engaged in dealing with these issues at various levels in international Relations.
			CO3	To understand to the Nature and emerging trends of India's Foreign Poli
SEMESTER VI				
T.Y.B.A.	VI CC-2E	Modern Political Analysis, G-3	**CO1**	To equip students with the contemporary debates across the ideologies
			CO2	To understand the basic concepts and to understand different forms of justifications of power and the role of ideologies in this regard.
T.Y.B.A.	DSE 1 D	Public Administration, Spl-3	**CO1**	To acquaint with concept of governance and its increasing significance in the era of globalization
			CO2	To make awareness about the administrative system of the nation.
			CO3	To discuss & evaluate various issues related to the institutional behaviour of Indian Administration
			CO4	To understand mechanism for the solution of problems in Indian Administration
T.Y.B.A.	DSE 2 D	International Relations, Spl-4	**CO1**	To acquaint students with the domestic and international security

				concerns
			CO2	To, understand of the relations of India with neighboring countries and major powers in the world
			CO3	The purpose of this course is to familiarize the students with some of the broad themes in the study of International Relations. It introduces the students to the evolutionary history of International Relations as a distinct discipline and provides them with the theoretical and conceptual dimensions of the subject.

Name of the Programme: B.A. Statistics

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
F.Y.B.A.	ST- 13871	Descriptive Statistics I	CO1	The student will be acquainted the scope and importance of role of basic statistics in the current scenario and shape his life as per his interest in the respective field.
			CO2	The student will be able to identify data types represent by graphical and diagrammatically also compute various measures of central tendency, dispersion, skewness and kurtosis
			CO3	The student will be able to analyse data pertaining to attributes and to interpret the results
			CO4	The student will be able to compute different summary statistics with their interpretation and process categorically.
	ST- 13271	Discrete Probability and Probability Distributions	CO1	The learners will be able to understand the basics of Probability, and the implement the concept of conditional probability and its related to Bayes' Theorem for computation of probability.
			CO2	The student will be able to understand concept of Univariate Probability distributions and apply to compute mathematical Expectation in real life situations.
			CO3	The Learner will compute the coefficients of Skewness and Kurtosis based on moments for discrete random variable.
			CO4	The student will learn the concept of some standard discrete probability univariate distributions and compute the probabilities as per the real life situations by choosing the particular distribution.
SEMESTER II				
F.Y.B.A.	ST- 13872	Descriptive Statistics II	CO1	The student will know the concept of correlation, its types and measures.
			CO2	The student understands the fitting of proper

				regression lines and will be able to fit appropriate equation to the given/collected data.
			CO3	The learner understands the concept of curve fitting to fit linear , quadratic and exponential curves to the bivariate data to investigate relation between two variables.
			CO4	The learner understands the concept of Index numbers and construction of index numbers by using various methods.
	ST- 13272	Discrete Probability Distributions	CO1	The learner will understand some Standard Discrete Probability Distributions such as Poisson and Geometric distributions and their application in real life situations.
			CO2	The learner understands basic concepts of Bivariate Probability Distributions.
			CO3	The student will learn to compute Mathematical Expectation based on Bivariate Random variable also theorems on expectations.
			CO4	The learner will be aware of some basic definitions such as conditional mean, variance, Covariance and Correlation.
SEMESTER III				
S.Y.B.A.	ST-23843	Sampling Techniques	CO1	The student will be acquainted the scope and importance of different sampling methods.
			CO2	The student will be able to determine sample size for attribute and variable.
			CO3	The student will be able to understand the basis of stratification and its uses.
			CO4	The student will be able to study various types of sampling methods and compare the results for better performance in real life situations.
	ST-23243	Discrete Probability Distributions And Time Series	CO1	The student will be acquainted the scope and importance univariate discrete distributions such as Negative Binomial Distribution and multinomial distribution and their properties.

			CO2	The student will be able to understand the concept of truncated distributions and its applications in real life situations.
			CO3	The student will be able to analyse data pertaining to time series by applying various methods.
			CO4	The student will be able to fit autoregressive models (AR).
	ST-23853	Continuous Probability Distributions	CO1	The learners will be able to understand the basics of Univar ate and Bivariate continuous distributions and applied in our real life situations.
			CO2	The student will be able to learn some Standard Univariate Continuous Distributions and distinguish it as per the data sets for analyse purpose for further interpretations.
			CO3	The Learner will compute the probabilities by using different continuous distributions such as Uniform, Normal and Exponential.
	ST-23863	Practicals	CO1	Students will be able to fit Negative Binomial and Normal Distribution to different types of data , manually as well as using EXCEL.
			CO2	Student will be able to grasp the knowledge of various applications of Multinomial, NBD and Normal distributions in real life.
			CO3	Student will be able to compute time series estimation.
			CO4	Students will be able to analyse the time series data sets by using Ms-Excel.
			CO5	Students will perform the Projects on applied field by collecting data and interpreting by using Ms Excel.
	Skill Enhancement Course SEC – 2A	Data Handling Through Ms-Excel	CO1	Student will able to do analysis of data for computing summary statistics.
			CO2	Student will learn basics of Excel and functions to compute probabilities using various distributions.

			CO3	Student will able to do analysis of bivariate data using statistical measures as correlation and regression.
			CO4	Student will able to graphical representation of data.
			CO5	Student will able to fit various regression models to data
SEMESTER IV				
S.Y.B.A.	ST-23244	Tests Of Significance And Statistical Methods.	CO1	The student will perform the tests based on Means and Proportions.
			CO2	The learner understands the fitting of trivariate data using regression model.
			CO3	The student also studies the Demography, understands the current situations regarding population studies.
			CO4	The learner will be study Queuing model as an application of Exponential and Poisson distribution.
	ST-23854	Sampling Distributions And Exact Tests	CO1	The learner will understand some continuous Distributions such as Gamma, Chi-square , t and F distributions and their application in real life situations.
			CO2	The learner will apply the test of hypothesis based on the above distributions.
			CO3	The student will learn to apply the tests as per data sets in day to day life.
			CO4	The learner will be handy to use the above tests for their interpretations.
	ST-23864	Practicals	CO1	The learner will be able to compute demographic results.
			CO2	The learner will be able to test for means and proportions.
			CO3	The student will be able to do tests based on Chi-square, t and F distributions.
			CO4	The student will learn about basic concept of R software and perform the practical.
			CO5	The learner will be able to apply statistical techniques collected data and perform the Project.
	ST-23844	Statistical Quality Control	CO1	The student will be able to study on line methods of Statistical Process Control.

			CO2	The learner will understands and interprets the control charts for variables.
			CO3	The student will also able to draw and interpret the control charts for attributes such as P chart, C-Chart etc.
			CO4	The learner will able to Statistical Process control using Off-line methods.
			CO5	The student will be able to compute capability indices under the study of capability studies.
	Skill Enhancement Course SEC- 2B	Data Handling Through R-Software	CO1	Student will get acquainted with various function in R.
			CO2	Student will learn basics of R software its functions, compute probabilities for various distributions.
			CO3	The learner will be able to compute the probabilities by using various discrete and continuous distributions in the real life situations.
SEMESTER V				
T.Y.B.A.	ST-33875	Statistics (General-III) Design and Analysis of Experiments (CC-1E)	CO1	Students will familiar with basic concepts of design of experiments, ANOVA, factorial design, etc.
			CO2	Students will get idea regarding a use of design of experiments tools in real life situations.
			CO3	Students will be able to plan and conduct smaller experiments within given time frames and also present the planning, implementation and analysis of a conducted experiment, in oral and written form.
			CO4	Students will be able to describe the purpose of factorial experiments and how it is applied in experimental design.

			CO5	Students will be able to analyse experimental data with suitable software.
	ST-33885	Statistics (Special-III) Distribution Theory–I (DSE-1C)	CO1	Students will be able to evaluate various univariate continuous distributions.
			CO2	Students will be able to obtain the distributions of order statistics.
			CO3	Students will be able to apply Chebychev's theorem to evaluate upper bound for different discrete and continuous distributions.
			CO4	Students will be able to understand the Pareto distribution with its scope in Economics.
			CO5	Students will be able to apply Central Limit Theorem and Weak Law of Large Numbers in real life situations.
	ST-33895	Statistics (Special-IV) Statistics Practical (DSE -2C)	CO1	Students will be able to conduct and analyse the data by using suitable designs of experiment with the help of ANOVA technique.
			CO2	Students will be able to analyse the design having one dependent variable and one concomitant variable with suitable design using ANCOVA technique.
			CO3	Students will be able to construct confidence intervals for various population parameters.
			CO4	Students will be able to identify applications of Chebychev's inequality, Order Statistics, CLT and WLLN.
			CO5	Students will be able to obtain the estimates of parameters of various distributions.
			CO6	Students will be able to estimates parameters related to truncated distributions using method of moments and MLE.
			CO7	Students will be able to conduct research project by using real field survey

	ST-33275	Mathematical Statistics (General-IV) Theory of Estimation (CC-2E)	CO1	Students will be able to use different methods of point estimations to real life data sets.
			CO2	Students will be able to construct interval estimations for different parameters.
			CO3	Students will be able to compare estimators of parameters using various criterions of it.
			CO4	Students will be able to check Unbiasedness, Sufficiency, Efficiency and Consistency of given estimators.
	SEC 2C	Medical Statistics And Clinical Trials	CO1	Students will be able to set the model for population growth.
			CO2	Students will be able to decide various factors related to epidemiology.
			CO3	Students will get acquainted with various terminology related to clinical trials.
			CO4	Students will be able to design and analyse clinical trial data.
	GE-1	Generic Elective Course (GE) Time Series Analysis	CO1	Students will be able to estimate various effects occurs in time series data.
			CO2	Students will be able to analyze the time series data by using regression analysis.
			CO3	Students will be able to apply Box Jenkins Techniques.
			CO4	Students will be able to analyse real life time series data related to Economics, Commerce, Weather etc.
SEMESTER VI				
T.Y.B.A.	ST-33876	Statistics (General-III) Operations Research (CC-1F)	CO1	Students will familiar with basic concepts of operation research, Linear Programming, CPM, PERT, etc.
			CO2	Students will familiar with various mathematical models used in operation research.
			CO3	Students will get idea regarding uses of optimization techniques in real life situations.

			CO4	Students will be able to analyse data with suitable software and interpret results.
	ST-33886	Statistics (Special-III) Distribution Theory–II (DSE-1D)	CO1	Students will be able to correlate Weibull distribution with other distributions such as Exponential and Gamma distribution.
			CO2	Students will be able to develop the relation of Laplace's distribution with Exponential distribution under certain conditions.
			CO3	Students will be able to prove non-existence of moments of Cauchy's distribution.
			CO4	Students will be able to develop the relation between Normal and Lognormal Distribution.
			CO5	Students will be able to use of bivariate Normal distribution and its applications and relation with Cauchy's distribution under assumptions.
	ST-33896	Statistics (Special-IV) Statistics Practical (DSE-2D)	CO1	Students will be able to draw/Simulate the sample observations from Cauchy and Laplace distribution.
			CO2	Students will be able to construct various parametric and non-parametric test various population parameters.
			CO3	Students will be able to formulate and obtain the optimal solution to Linear Programming Problem.
			CO4	Students will be able to solve problems related to Transportation, Assignment, CPM and PERT.
			CO5	Students will be able to conduct research project by using real field survey.
	ST-33276	Mathematical Statistics (General-IV)	CO1	Students will get acquainted with various terminology related to parametric tests.

		Testing of Hypothesis (CC-2F)	CO2	Students are able to apply the LRT to different parameters of various distributions.
			CO3	Students are able to apply the SPRT to different parameters of various distributions.
			CO4	Students are able to apply various non-parametric tests to real life situations.
			CO5	Students are able to apply the testing of hypothesis on real life data set.
	SEC 2D	Data Analytics	CO1	Students are able to apply data cleaning tools and data mining process.
			CO2	Students are able to apply various types of classification techniques.
			CO3	Students are able to do market basket analysis.
			CO4	Students are able to apply Artificial Neutral Network(ANN) and Support Vector Machine(SVM) in real life.
	GE2	Operations Management	CO1	Students are able to solve the problems of replacement theory.
			CO2	Students are able to solve various problems related to inventory.
			CO3	Students are able to solve various problems related to decision theory.
			CO4	Students are able to solve various problems related to game theory and sequencing.

Name of the Programme: B.A. Urdu

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
F.Y.B.A.	11071	Urdu General I	**CO1**	The students will be able to understand Chronological development of Urdu nazm as a poetic form of literature & its kinds.
			CO2	The student understands Life sketch and literary works as well as poetic status of Dr. Allama Iqbal.
			CO3	The students will be able to understand Life sketch, Literary works and style of Prem Chand and Ali Abbas Hussaini.
SEMESTER II				
F.Y.B.A.	11072	Urdu General II	**CO1**	The students will be able to understand Life sketch and literary works as well as poetic status of Nazeer Akbarabadi, Maulana Altaf Husain Hali and Pandit Brij Narayan Chakbast.
			CO2	The students understand history and evoulutionary development of Urdu Tanz-o-Mazah.
			CO3	The learner will understand Life sketch, Literary trends and style of Pitras Bukhari and Khawaja Hasan Nizami.
SEMESTER III				
S.Y.B.A.	23070	Prose & Poetry Text III	**CO1**	The students will be able to understand the evolutionary development of literary trends in Urdu literature.
			CO2	The students will able to understand the history of Nazm Nigari, definition, Techniques and its utility.
			CO3	The students will be able to understand Life Sketch, Poetic arts style and trends of Nazeer Akbar Abadi and his Nazm Nigari.
			CO4	The students will be able to understand the life sketch, literary works and writing style of Sir Sayyed Ahmed Khan.
S.Y.B.A.	23071	History of Urdu Literature (Prose) I	**CO1**	The learner understands the peculiarities and importance of Literary trends, evolutionary development of various forms of prose writing.
			CO2	The learner understands the different types of Urdu prose-critics and history of Urdu prose writers.
			CO3	The students will be able to understand the life sketch, literary works and writing style of Maulana Shibli, Ehtesham Husain and Farhatullah Baig.
S.Y.B.A	23072	Study of Modern	**CO1**	The students will be able to understand the

		Prose Writing (Inshaiya) II		Modern trends of prose writing in Urdu literature.
			CO2	The learner understands the Life sketch, literary works and style of Maulana Abul Kalam Azad and Mushtaque Ahmed Yusufi.
S.Y.B.A.	23073	Enhancement of Reading &Writing Skills	**CO1**	The students will be able to understand the communication skill of Urdu language.
			CO2	The students will be able to recognition of alphabets, words and numeric.
			CO3	The students will be able to make sentences and reading paragraph and answering the question.
SEMESTER IV				
S.Y.B.A	24070	Modern Prose & Poetry III	**CO1**	The students will be able to understand the evolutionary development of literary trends in Urdu literature.
			CO2	The students will able to understand the prose and poetry forms.
			CO3	The students will be able to understand chronological development of Mazahiya Nazm Nigari and Life sketch, literary works as well as poetic status of Akbar Ilahabadi.
			CO4	The students will be able to understand chronological development and forms of short story writing and Life sketch, literary works and writing style of prescribed short story writers.
S.Y.B.A.	24071	History of Urdu Literature (Poetry) I	**CO1**	The learner understands the different poetic branches of Urdu poetry-critics and history of Urdu poets.
			CO2	The learner understands the some Urdu poets, Asgar Gondvi, Amjad Hyderabad and Nasir Kazmi. An introduction of Poets and their Poetic source.
S.Y.B.A.	24072	Special Study of Poets II	**CO1**	The learner understands the classical & modern forms of poetry and history of Urdu poets.
			CO2	The students will be able to understand chronological development and forms of Urdu Ghazal and Life sketch, literary works and poetic art of Allama Iqbal and Faiz Ahmed Faiz.
S.Y.B.A.	24073	Communication Skills	**CO1**	The students will be able to enhance the reading, writing, listening and speaking skills in Urdu.
			CO2	The students will be able to understand basic grammar and communication skills of Urdu language.
			CO3	The students will be able to make simple sentences, compound sentences and complex sentences.

POSTGRADUATE PROGRAMME: COURSE OUTCOME

Name of the Programme: M.A. Urdu

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
M. A. I	URD 501 MJ	Urdu: Study of Modern Prose	CO1	After successfully completing this course, students will be able to: Chronological Development of biography Writing in Urdu.
			CO2	Explain the Effects of Aligarh Literary Movement on Urdu Literature.
			CO3	The students will be able to understand Life sketch, Literary works and style of Maulana Altaf Husain Hali.
			CO4	Students will be able to understand Critical Study of Yaad Gaare Ghalib .
			CO5	Students will be able to understand chronological development and forms of Novel writing and Life sketch, literary works and writing style of Munshi Prem Chand.
			CO6	Students will be able to understand the Kinds, Techniques of Urdu Novel.
M.A. I	URD 502 MJ	Mass Media	CO1	After successfully completing this course, students will be able to: News –Sources of News, Various types of News i.e. Local, National and International Levels, on current events, Sport News, Criminal News etc
			CO2	Interview, Reportaz, Dialogue writing, Script writing, Editorial, Column Writing.
			CO3	Evolutionary Development of TV in India – TV, Drama , Telefilm, Film drama, Film Serial, Advertisement, use and importance of computers and Internet.
			CO4	Film Industries – Evolutionary development of film industry in India. Effects of film on culture and morality. Types of Film – Documentary

				Educational, criminal, Feature etc.
M.A. I	URD 503 MJ	Urdu: Essay, Rhetoric, Grammar & Prosody	CO1	After successfully completing this course, students will be able to: Essay on General, Literary Topics.
			CO2	Students will be able to understand the Figures of Speech and Parts of Speech.
			CO3	Chronological Development of Urdu Language.
			CO4	Students will be able to understand the Figures of Speech and Figures of Speech.
			CO5	Students will be able to understand the scansion the couplet.
M.A. I	URD 504 MJ	Urdu: Study of Satire & Humour	CO1	After successfully completing this course, students will be able to: Chronological Development of Satire and Humour Writing in Urdu.
			CO2	Student will understand the concept of Satire and humour.
			CO3	Life sketch, literary works and writing style of Rashid Ahmed Siddique, Kanhaiyya Lal Kapoor and Pitras Bukhari.
			CO4	Skill writing of humour and satire will be enhance.
				Students will be able to understand the Kinds, Techniques of Satire and Humour.
M.A. I	URD 511ME	Urdu: Study of Fiction Writer (Qurratulain Haider)	CO1	After successfully completing this course, students will be able to: Understand the emerging trends of Fiction writing in Urdu literature.
			CO2	Life sketch, literary works and writing style of Qurratulain Haider.
			CO3	Student will understand the changing trends of Urdu fiction.
M.A. I	URD 541 RM	Research Methodology	CO1	After successfully completing this course, students will be able to: Research objectives, principles, aims, and relationship between research and criticism.
			CO2	Student will understand the types of research, data collection, sources of research material and research ethics.
			CO3	Students will be able to: Prepared research synopsis.

SEMESTER II				
M.A. I	URD 551 MJ	Modern Poetry Text	CO1	After successfully completing this course, students will be able to: Chronological Development of Modern Urdu Poetry.
			CO2	Life sketch, literary trends, style, literary works and philosophy of Allama Iqbal.
			CO3	Explain the couplets.
			CO4	Critical Study of Bale-e- Jibrail.
			CO5	Social cultural political and literary conditions of Urdu Ghazal in Modern Period.
			CO6	Life sketch, literary trends, style and literary works of Faiz Ahmed Faiz.
			CO7	Students will be able to explain the Faiz Ahmed Faiz Ghazal.
M.A. I	URD 552 MJ	Study of Drama	CO1	After successfully completing this course, students will be able to: Kinds, utility, techniques and importance of Drama writing.
			CO2	Chronological Development and silent feature of Drama.
			CO3	Life sketch, literary trends, style and literary works of Habib Tanveer.
			CO4	Critical Study Agra Bazar.
M.A. I	URD 553 MJ	Urdu Linguistic	CO1	After successfully completing this course, students will be able to: Chronological Development of Urdu Language.
			CO2	Thoughts of Schools about Origin of Urdu Language.
			CO3	Correlation between Urdu Language and other Subjects.
			CO4	Importance and kinds of Phonetics.
			CO5	The Role of Sufi's in the Development of Urdu Language.
M.A. I	URD 554 MJ	Special Study of Poet (Ahmad Faraz)	CO1	After successfully completing this course, students will be able to: Explain the poetry and couples.
			CO2	Life sketch, literary trends, style and literary works of Ahmad Faraz.
			CO3	Poetic art of Ahmad Faraz.
			CO4	Ghazal as poetic form of literature.
			CO5	Contemporary Ghazal of Ahmad Faraz

M.A. I	URD 563 MI:	Study of Modern Poet (Makhdoom Mohiuddin)	CO1	After successfully completing this course, students will be able to: Effects of Progressive Writers' Movement on Urdu Literature.
			CO2	Life sketch, literary trends, style and literary works of Makhdoom Mohiuddin.
			CO3	Poetic art of Makhdoom Mohiuddin.
			CO4	Ghazal as poetic form of literature.
			CO5	Contemporary Ghazal of Makhdoom Mohiuddin.
SEMESTER III				
M.A. II	30701	Medieval Prose Texts Subordinate	CO1	After successfully completing this course, students will be able to: Historical, Political, Cultural, Literary trends and social conditions Medieval period of India.
			CO2	Explain the concept of nutrition and digestion.
			CO3	Explain the structure, contraction and types of contraction of muscle.
			CO4	Illustrate bioluminescence and animal electricity with examples and its significance
			CO5	Correlate the organisms Internal and external environments with homeostasis and biological Clocks.
			CO6	Diagrammatically represent the mechanism of respiration, gas exchange and transport
M.A.II	30702	History of Urdu Literature	CO1	After successfully completing this course, students will be able to: Social Political, Economic & literary conditions of the Up to 1857.
			CO2	As a poetic form of Ghazal writing, its technique, utility and characteristics, Life sketch, trend and style of Meer Taqui Meer.
			CO3	As a poetic form of mersiya writing, its importance and utility, techniques Life sketch, style and importance of writing of Meer Anees.
			CO4	Kinds, utility and importance of Qaseeda writing as well as techniques and importance Qaseeda Writing in Urdu Poetry, Life sketch, literary ability, trends and style of Mohd. Rafee Sauda.

			CO5	Kinds, utility, techniques and importance of dastan writing, Life sketch, literary ability and trends and style of Mullawajhi.
M.A. II	30703	Principles of literary criticism	CO1	After successfully completing this course, students will be able to: Definition, techniques of criticism, principles of criticism, importance of criticism, aims and objectives of criticism and research methodology. Effects of European Thoughts on Urdu Literature.
			CO2	Urdu Critic: Mualana Mohd. Husain Azad, Hali, Al Ahmed Suroor, Shamsurrahman Farooqui
			CO3	Research methodology types and importance, sources of contents, tadweene matan
			CO4	Aims and objectives and techniques of research methodology.
M.A. II	30704	Critical study of Deccani literature (Deccani Ghazal)	CO1	After successfully completing this course, students will be able to: Social cultural political and literary conditions of Qutub Shahi and Aadil shahi periods.
			CO2	Explain the concepts of immunity, self-nonself immune response, autoimmune disease.
			CO3	Quli Qutub Shah and Hashmi as literary Artist.
			CO4	Deccani Ghazals, its subject matter, importance and utility.
			CO5	Mulla Wajhi and Gawassi as literary Artist.
			CO6	Deccani Ghazal, its subject matter, importance and utility.
SEMESTER IV				
M.A. II	40701	Medieval Poetry Texts	CO1	After successfully completing this course, students will be able to: As a poetic form of Masnavi writing, its importance, utility, techniques and characteristics.
			CO2	Life sketch, style, importance, literary works and contemporary poets of Daya Shankar Naseem
			CO3	Masnavi writing specially in Shamali

				Hind.
			CO4	Critical Study of Gulzare Naseem.
			CO5	Chronological Development of Urdu Ghazal.
			CO6	As a poetic form of Ghazal writing, its importance, utility, techniques and characteristics.
			CO7	Life sketch, style, importance, literary works and contemporary poets of Mirza Ghalib.
M.A. II	40702	History of Urdu literature from 1857 to 1990	CO1	After successfully completing this course, students will be able to: Effects of Aligarh Literary Movement on Urdu Literature.
			CO2	Effects of Progressive Writers' Movement on Urdu Literature.
			CO3	Life sketch, literary ability and trends, style and contemporary prose writers of Munshi Prem Chand and Qurratul Ain Haider.
			CO4	As a poetic form of Novel and Afsana writing, its importance, utility, kinds, techniques and characteristics.
M.A. II	40703	History of Urdu literary criticism	CO1	After successfully completing this course, students will be able to: Definition, techniques of criticism, principles of criticism, importance of criticism, aims and objectives of criticism and research methodology. Effects of European Thoughts on Urdu Literature.
			CO2	Importance of Urdu Tazkere. Evolutionary development of Urdu Literary criticism. School of literary criticism i.e. Tassurati Tanqeed. Nafsiyati Tanqeed, Marxi Tanqeed, Scientific Tanqeed.
			CO3	Altaf Husain Hali and Kaleemuddin Ahmed as a Critic.
			CO4	Al Ahmed Suroor and Naseeruddin Hashmi as a critic.
M.A. II	40704	Critical study of Deccani literature	CO1	After successfully completing this course, students will be able to: Social cultural political and literary conditions of Qutub Shahi and Aadil shahi periods.

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			CO2	Nusrati and Gauwasi as literary Artist.
			CO3	Muqeemi and Rustami as literary Artist.
			CO4	Deccani Masnav , its subject matter, importance and utility.

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SEMESTER III				
M.A. II	30701	Medieval Prose Texts Subordinate	**CO1**	After successfully completing this course, students will be able to: Historical, Political, Cultural, Literary trends and social conditions Medieval period of India.
			CO2	Explain the concept of nutrition and digestion.
			CO3	Explain the structure, contraction and types of contraction of muscle.
			CO4	Illustrate bioluminescence and animal electricity with examples and its significance
			CO5	Correlate the organisms Internal and external environments with homeostasis and biological Clocks.
			CO6	Diagrammatically represent the mechanism of respiration, gas exchange and transport
M.A.II	30702	History of Urdu Literature	**CO1**	After successfully completing this course, students will be able to: Social Political, Economic & literary conditions of the Up to 1857.
			CO2	As a poetic form of Ghazal writing, its technique, utility and characteristics, Life sketch, trend and style of Meer Taqui Meer.
			CO3	As a poetic form of mersiya writing, its importance and utility, techniques Life sketch, style and importance of writing of Meer Anees.
			CO4	Kinds, utility and importance of Qaseeda writing as well as techniques and importance

				Qaseeda Writing in Urdu Poetry, Life sketch, literary ability, trends and style of Mohd. Rafee Sauda.
			CO5	Kinds, utility, techniques and importance of dastan writing, Life sketch, literary ability and trends and style of Mullawajhi.
M.A. II	30703	Principles of literary criticism	**CO1**	After successfully completing this course, students will be able to: Definition, techniques of criticism, principles of criticism, importance of criticism, aims and objectives of criticism and research methodology. Effects of European Thoughts on Urdu Literature.
			CO2	Urdu Critic: Mualana Mohd. Husain Azad, Hali, Al Ahmed Suroor, Shamsurrahman Farooqui
			CO3	Research methodology types and importance, sources of contents, tadweene matan
			CO4	Aims and objectives and techniques of research methodology.
M.A. II	30704	Critical study of Deccani literature (Deccani Ghazal)	**CO1**	After successfully completing this course, students will be able to: Social cultural political and literary conditions of Qutub Shahi and Aadil shahi periods.
			CO2	Explain the concepts of immunity, self-nonself immune response, autoimmune disease.
			CO3	Quli Qutub Shah and Hashmi as literary Artist.
			CO4	Deccani Ghazals, its subject matter, importance and utility.
			CO5	Mulla Wajhi and Gawassi as literary Artist.
			CO6	Deccani Ghazal, its subject matter, importance and utility.
SEMESTER IV				
M.A. II	40701	Medieval Poetry Texts	**CO1**	After successfully completing this course, students will be able to: As a poetic form of Masnavi writing, its importance, utility, techniques and characteristics.
			CO2	Life sketch, style, importance, literary works and contemporary poets of Daya Shankar Naseem.
			CO3	Masnavi writing specially in Shomali Hind.
			CO4	Critical Study of Gulzare Naseem.
			CO5	Chronological Development of Urdu Ghazal.

			CO6	As a poetic form of Ghazal writing, its importance, utility, techniques and characteristics.
			CO7	Life sketch, style, importance, literary works and contemporary poets of Mirza Ghalib.
M.A. II	40702	History of Urdu literature from 1857 to 1990	**CO1**	After successfully completing this course, students will be able to: Effects of Aligarh Literary Movement on Urdu Literature.
			CO2	Effects of Progressive Writers' Movement on Urdu Literature.
			CO3	Life sketch, literary ability and trends, style and contemporary prose writers of Munshi Prem Chand and Qurratul Ain Haider.
			CO4	As a poetic form of Novel and Afsana writing, its importance, utility, kinds, techniques and characteristics.
M.A. II	40703	History of Urdu literary criticism	**CO1**	After successfully completing this course, students will be able to: Definition, techniques of criticism, principles of criticism, importance of criticism, aims and objectives of criticism and research methodology. Effects of European Thoughts on Urdu Literature.
			CO2	Importance of Urdu Tazkere, Evolutionary development of Urdu Literary criticism, School of literary criticism i.e. Tassurati Tanqeed, Nafsiyati Tanqeed, Marxi Tanqeed, Scientific Tanqeed.
			CO3	Altaf Husain Hali and Kaleemuddin Ahmed as a Critic.
			CO4	Al Ahmed Suroor and Naseeruddin Hashmi as a critic.
M.A. II	40704	Critical study of Deccani literature	**CO1**	After successfully completing this course, students will be able to: Social cultural political and literary conditions of Qutub Shahi and Aadil shahi periods.
			CO2	Nusrati and Gauwasi as literary Artist.
			CO3	Muqeemi and Rustami as literary Artist.
			CO4	Deccani Masnav , its subject matter, importance and utility.

Name of the Programme: B.Com.

Name of the class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
F.Y.BCOM	111	Compulsory English-I	**CO1**	Students will develop the students overall linguistic competence and communicative skills
			CO2	Student will develop written and Communication Skills to improves their prospects of employability
F.Y.BCOM	112	Financial Accounting- I	**CO1**	Students will be able to acquire in-depth knowledge
			CO2	Students will be able to acquire in-depth knowledge
			CO3	Students will be able to understand the process and importance of conversion of single entry into double entry system
			CO4	Students will gain knowledge about GST and its implications.
F.Y.BCOM	113	Business Economics-1	**CO1**	Students will understand basic concepts of micro economics
			CO2	Will be able to analyze and interpret ,Will know cardinal and ordinal approach
			CO3	Will understand the concept of consumer surplus, Will understand the concept of demand and elasticity of demand
			CO4	Will understand the concept of supply and able to interpret equilibrium in the market
			CO5	Will understand revenue concept ,Will know economies and diseconomies of scale
F.Y.BCOM	114 (A)	Business Mathematics and Statistics – I	**CO1**	Students will be able to apply concepts of interests and annuities to calculate EMI, prepare amortization schedule, calculate insurance premiums etc.
			CO2	Students will be able calculate dividend, brokerage on shares and mutual funds. Also, students will be able to able to identify the contribution of shares and mutual funds in systematic investment plans and to select best investment options

			CO3	Students will be able to recognize and classify different types of data. Students will be able to take a sample of appropriate size using suitable method of sampling.
			CO4	Students will be able to calculate measures of central tendency and measures of dispersion. Students will be able to use appropriate measure of central tendency or measure of dispersion for given data to given problems from business or economics.
F.Y.BCOM	114 (B)	Computer Concepts and Application-I	**CO1**	Students familiar with the basics of Operating System and business communication tools.
			CO2	Students familiar with basics of Network, Internet and related concepts.
			CO3	Students about applications of Internet in Commerce.
			CO4	Students about applications of Internet in Commerce.
			CO5	Students understand about e-commerce and M commerce.
F.Y.BCOM	115-A	Organizational Skills Development-I	**CO1**	Conceptual Clarity on meaning of Modern Office, internal and external factors of an office environment.
			CO2	Conceptual clarity on the meaning of Scientific office management and understanding various techniques for scientific management.
			CO3	Technical skills and Critical analysis skills.
			CO4	Development of Technical and Analytical abilities.
F.Y.BCOM	115-B	Banking and finance	**CO1**	Knowledge of evolution of banking.
			CO2	Understanding structure of Indian Banking.
			CO3	Understanding primary and secondary functions of a bank.

			CO4	Understanding the concepts related to lending and ratios.
			CO5	Understanding the process of opening and operating procedure of bank accounts.
			CO6	Understanding various types of bank accounts holders
F.Y.BCOM	116A	Essentials of E-Commerce	**CO1**	Developing understanding on Ecommerce.
			CO2	Awareness on various e-commerce platforms.
			CO3	Technical, Practical, Analytical and Creative Skills.
			CO4	Technical and Practical Skills
F.Y.BCOM	116 - D	Consumer Protection and Business Ethics	**CO1**	Acquaint Knowledge and maturity to understand the consumer's interest.
			CO2	To get training to face emerging issues. To seek career opportunity in this field.
			CO3	To Acquaint knowledge and application of laws
			CO4	To defend and safety in e commerce. To learn e skills.
F.Y. BCOM	116-C	Marketing & Salesmanship	**CO1**	Student will get acquainted with the basics of marketing field.
			CO2	It will highlight on the core marketing concepts namely 'Marketing Mix'. It will help students to implement this knowledge in practicality by enhancing their skills in the field of market segmentation.
			CO3	Students will develop the skills of Pricing the product along with gaining knowledge on Product Mix
			CO4	It will help the students to apply the various techniques of Promotion and understand the various channels of distribution
F.Y. BCOM	116-E	Business Environment	**CO1**	Understanding of various aspects business environment useful for would be

		& Entrepreneurship – I		entrepreneurs
			CO2	Understanding of various aspects of pollution and its ill effects and Understanding of Problems and their causes and remedies
			CO3	Understanding the concept of entrepreneur, competencies of a successful entrepreneur
SEMESTER II				
F.Y. BCOM		English- I I 121	**CO1**	Students will develop the students overall linguistic competence and communicative skills
			CO2	Student will develop written and Communication Skills to improves their prospects of employability
			CO3	Student will expose the variety of practical skills
F.Y. BCOM	122	Financial Accounting-II	**CO1**	Acquaint themselves with Computerized accounting, its application and utility.
			CO2	Understanding the accounting process of accounting of charitable trusts
			CO3	Analyzing , interpreting and communicating the information contained in basic financial statements and explain the limitations of such statements
			CO4	Learning the concept of intangible assets and the methods of their valuation
			CO5	Understanding the process and methods of leasing.
F.Y. BCOM	123	Business Economics-II	**CO1**	Will understand the concept and types of cost
			CO2	Students will know about short run and long run cost concepts
			CO3	Students will have knowledge about types of revenue and understand the concept of pure and perfect competition
			CO4	Students will know about the equilibrium of firm and industry in short and long run and will able to compare perfect and

				imperfect competition
			CO5	Will develop ability to understand the market structures under imperfect competition
			CO6	Will understand the theory of marginal productivity and the concept and theories in factor pricing
F.Y. BCOM	124(A)	Business Mathematics and Statistics –I I 124 (A)	**CO1**	Students will be able to apply the theory of matrices to solve business and economic problems.
			CO2	Students will be able represent business and economic optimization problems involving two variables as LPP and solve those problems using graphical method
			CO3	Students will able to predict the type of relationship between bivariate data. Students will be able predict the value of unknown from give bivariate data.
			CO4	Students will be able compute different index numbers. Students will be able to compute cost of living
F.Y. BCOM	124(B)	Computer Concepts and Application-II	**CO1**	Familiar with E-commerce Tools
			CO2	Familiar with E-Marketing
			CO3	Familiar with Electronic Payment System
			CO4	Familiar with M-Commerce
F.Y.BCOM	125-A	Organizational Skills Development-II	**CO1**	Conceptual Clarity Goal Setting and Goal Measurement, Enhancing the Time Management Skills
			CO2	Enhancing Communication Skills, Usability of latest communication media
			CO3	Development Technical and analytical skills
			CO4	Development of Technical skills
F.Y.BCOM	125(B)	Banking and finance II	**CO1**	Student will develop the working capability of in banking sector
			CO2	Students aware of Banking Business and

				practices.
			CO3	Students Understand regarding the new concepts introduced in the banking system
F.Y. BCOM	126 A	Essentials of Ecommerce II	**CO1**	Conceptual understanding of Electronic Data Interchange, documentation and merits of EDI.
			CO2	Awareness about payment solutions, various payment methods and modern modes of digital payments.
			CO3	Understanding of E-commerce security, precautions while using E-commerce and methods & Process of E-Commerce security.
			CO4	Technical knowledge about virtual market and other business to business e-commerce communication.
F.Y. BCOM	126 (D)	Business Ethics-II	**CO1**	Acquaint knowledge and maturity to understand the Business Ethics
			CO2	Application of CSR in various section
			CO3	To analyze corporate governance in India
			CO4	To understand and achieve sustainable development
F.Y.BCOM	126-C	Marketing and Salesmanship - Fundamental of Marketing-II	**CO1**	Students will get knowledge of the basics of salesmanship which is a vital aspect of marketing.
			CO2	It will help the students to implement this knowledge in practicality by enhancing their skills in the field of marketing by using various techniques of salesmanship
			CO3	It will help the students to gain insights about Rural Marketing and its uniqueness
			CO4	It will help the students to gain the insights about recent trends in marketing field.
F.Y.BCOM	126 (E)	Business Environment & Entrepreneurs	**CO1**	Understanding the difference between entrepreneurial and nonentrepreneurial personalities and thereby getting inspiration to make students personality

		hip – II		entrepreneurial
			CO2	Understanding the significance of entrepreneurship in economy thereby getting inspiration to become entrepreneur
			CO3	Knowing the functions of related institutions
			CO4	Inspiration from study of Biographies to become entrepreneurs
SEMESTER III				
S.Y.BCOM	231	Business Communication	**CO1**	Understanding of basic knowledge of Business Communication
			CO2	Understanding of basic knowledge of Business Communication
			CO3	Understanding the knowledge about soft skills.
			CO4	To create awareness about soft skill among the students
S.Y.BCOM	232	Corporate Accounting	**CO1**	Developing understanding on applicability of various Accounting Standards
			CO2	Knowledge about types of profit and their apportionment
			CO3	Conceptual Clarity and Practical understanding
			CO4	Analytical skills enhancement and Decision-making skills of students will be developed
S.Y.BCOM	233	Business Economics	**CO1**	Students will understand basic concepts of macro economy mics Will be able to analyze and interpret
			CO2	Will know various concepts of national income Will understand the methods of calculation of national income and difficulties involved therein.
			CO3	Will understand Says law of employment Will understand the difference between classical and Keynesian theory Able to interpret Keynes theory of effective

				demand
			CO4	Will understand the concept of saving and investment Will know the effect of multiplier and acceleration in the economy.
S.Y. BCOM	234	Business Management	**CO1**	Students will get an idea about the basic managerial process
			CO2	Students will get an idea about how planning works in real life.
			CO3	Students will understand the process of implementation of both the concepts
			CO4	Students will understand importance of proper direction and team work.
S.Y.BCOM	235	Elements of Company Law	**CO1**	Acquaint with knowledge and maturity to understand Company law 2013
			CO2	To Acquaint knowledge and application of formation and incorporation of Company
			CO3	To understand the knowledge about the principal documents of the company.
			CO4	To inculcate skills and knowledge about the share capital of the company.
S.Y.BCOM	236 A	Business Administration-I	**CO1**	Students will get an idea about how different forms of business organizations can be formed and operated.
			CO2	Students will understand the impact that various factors operating in external environment can have on business
			CO3	Students will understand the impact that various factors operating in external environment can have on business
			CO4	The development strategies of business can be introduced.
S.Y.BCOM	236 B	Banking and Finance-I	**CO1**	Student will get the knowledge about Indian Banking System.
			CO2	Student will understand the role of banking in economic development
			CO3	Student gets the knowledge about working

				of Central Banking in India.
			CO4	To know the functioning of private and public sector banking in India.
S.Y.BCOM	136E	Cost and Works Accounting	**CO1**	To remember and understand basic concept of cost accounting. Development of an overall outlook of Cost Accounting
			CO2	Ability to prepare a cost sheet
			CO3	Ability to understand which procedures are used for purchasing the material 2) Understand the documentation for purchase procedures
			CO4	Understanding methods used for controlling the inventory.
S.Y.BCOM	236 H	Marketing Management	**CO1**	Student will get acquainted with the basics of Marketing Management subject
			CO2	It will help students to know the preferences, likes and dislikes of the consumer which lead to the further modernization of the sales strategies by marketer.
			CO3	It will help them to implements this knowledge practical situations by enhancing their skills in the field of marketing.
			CO4	To enable the students to study the effect of external environment on decision-making of the firm.
SEMESTER IV				
S.Y.BCOM	241	Business Communication-II	**CO1**	Understanding of basic knowledge of Report Writing and Internal Correspondence and Import-Export Correspondence.
			CO2	Learning the Recent Trends in Business Communication.
			CO3	To create ability among the students for Drafting of Business Letters.
			CO4	To create ability among the students about

				Writing Formal Mails and Blog writing
			CO5	To create ability among the students about Writing and Internal Correspondence
			CO6	Also understanding the knowledge of Recent Trends in Business Communication.
S.Y.BCOM	242	Corporate Accounting-II	**CO1**	Developing understanding on accounting procedure for Holding companies.
			CO2	Conceptual understanding, Practical application skills in the process of accounting for Absorption.
			CO3	Practical understanding on Process of Liquidation on companies
			CO4	Updating of Knowledge on recent advances in the field of Accountancy.
S.Y. BCOM	243	Business Economics-II	**CO1**	Students will understand concept and theories of money and able to critically evaluate supply of money in the economies.
			CO2	Will understand the causes and consequences of inflation
			CO3	Will understand the concept of stagflation and understand phases of trade cycle
			CO4	Will understand the types of policies and understand public revenue and public expenditure concept
			CO5	Able to interpret effect of anticyclical policies on the economy
			CO6	Will be able to analyze, interpret and criticize public policies with theoretic al base
S.Y.BCOM	244	Business Management-II	**CO1**	Students will get an idea about how leadership influences organizational success
			CO2	Students will understand the significance of coordination and control in modern business management.

			CO3	Students will understand the significance of coordination and control in modern business management.
			CO4	Students will come across various emerging trends in management
S.Y.BCOM	245	Elements of Company Law-II	**CO1**	To Acquaint knowledge and maturity to understand Company management
			CO2	To Acquaint with knowledge and role of key managerial person of the Companies and Rules about CSR.
			CO3	To get training in to various types of meeting and procedure.
			CO4	To enhance skills and knowledge about the E- governance of the company and winding-up of the company.
			CO5	To be able to appreciate the emerging E Governance and E- filing under the Companies Act, 2013. Learn the winding up of company.
S.Y.BCOM	246 A	Business Administration-II	**CO1**	Students will get an idea about the legal environment of business
			CO2	Help students understand the importance of various stake holders of business and the efficient way of establishing a rapport with them for business development Student will understand greater insight on mergers, acquisitions and other strategies
S.Y.BCOM	246 B	Banking and Finance-II	**CO1**	Understand the knowledge of Cooperative Banking in India
			CO2	Student able to analyze the functioning of Development Banking
			CO3	Student will understand Banking Sector Reforms
			CO4	Understand the role of various committees on Banking Sector Reforms.
S.Y.BCOM	246 E	Cost and Works Accounting	**CO1**	Understanding various methods used in the pricing of the issue of materials
			CO2	Enabling to calculate wage payment and incentives.
			CO3	Understanding the process of job analysis, job evaluation and merit rating.
			CO4	Insight into recent processes used for cost

				reduction
S.Y. BCOM	246 H	Marketing Management	**CO1**	Students will understand how Green Marketing is necessary for marketers to use resources efficiently, so that organizational objectives are achieved without waste of resources.
			CO2	It will help the student to apply the various techniques and methods of E- Marketing practically.
			CO3	It will help them to implement the knowledge of Digital Marketing in practical by enhancing their skills in the field of Marketing.
			CO4	It will help them to gain a solid understanding of the theoretical and conceptual knowledge of international marketing.
SEMESTER V				
T.Y.BCOM	351	Business Regulatory Framework-I	**CO1**	Acquaint knowledge and maturity to understand Contract Law.
			CO2	To give Comprehensive insight about the emerging trend of Arbitration and conciliation and its regulatory mechanism
			CO3	Compressive understanding about the sale of Goods Act. Acquaint knowledge about ownership and delivery of goods.
			CO4	Understand the nature of partnership, Rights and duties of Partner Handling the registration and dissolution of the partnership. Aquent Knowledge about LLP
			CO1	Understand the concept of Contract and its contents. Equip the students with knowledge of nature and performance and breach of Contracts
T.Y.BCOM	352	Advanced Accounting-I	**CO1**	Developing understanding on applicability of various Accounting Standards
			CO2	Knowledge about of the Accounting for Capital Restructuring
			CO3	Conceptual Clarity and Practical understanding of preparation of final accounts of banking companies.
			CO4	Developing knowledge about Investment Accounting
T.Y.BCOM	353	Indian & Global Economic Development-	**CO1**	Students will be able to understand present Economic Scenario of Indian Economy as well as World Economy.
			CO2	Students will be able to understand the

		I		various aspects of development in Agricultural, Industrial and service sector in India.
			CO3	Student will be able to critically evaluate the role of India in international economy.
			CO4	Students will be able to evaluate the working of international financial organization and institutions.
T.Y.BCOM	353	International Economics-I	**CO1**	Students will be able to understand present Economic Scenario of Indian Economy as well as World Economy.
			CO2	Students will understand the working of foreign trade market and foreign exchange market.
			CO3	Students will be able to comprehend trade policies and concepts related to trade policies.
			CO4	Students will be able to use the subject knowledge in their future academic and professional ventures.
T.Y.BCOM	354	Auditing	**CO1**	Acquaint with knowledge and maturity to understand concept of Auditing, types of Audit and Audit Process.
			CO2	Conceptual Clarity and Practical understanding of Vouching Verification and valuation and Types of Audit Report.
			CO3	Practical knowledge about appointment, reappointment and other related provision. Practical knowledge about Tax Audit as per I.T. Act 1961 (Form 3CA, 3CB & 3CD)
			CO4	Understanding new concepts under Audit of Computerized Systems & Forensic Audit
T.Y.BCOM	355 A	Business Administration – II (Human Resource Management) (355 (a))	**CO1**	Developing Conceptual understanding and Conceptual Clarity Learning of the Latest development in Human Resource
			CO2	Conceptual Clarity and Practical Understanding Hands on Experience Technical Knowledge
			CO3	Conceptual Clarity and Practical understanding Creative and Imaginative Skills Innovation
			CO4	Analytical skills Decision making skills Creative and Imaginative Skills
T.Y.BCOM	PR- 356 (a)	Business Administratio	**CO1**	Acquaint the student with knowledge about Corporate Finance and the structure

		n – III (Finance)		if the Indian Financial Market
			CO2	develop the Financial Planning Skills among the Students by introducing them to the process of efficient Financial Planning
			CO3	educate the students on the importance of Capitalization and the importance to maintaining an optimum capital structure
			CO4	will know about the various sources of Finance available for raising corporate capital
T.Y.BCOM	355-B	Banking and Finance II	**CO1**	Understanding the Indian Financial System. Understanding the meaning, structure and role of Financial System in India.
			CO2	Understanding the meaning, functions, credit instruments, deficiencies and recent development in Money Market in India.
			CO3	Understanding the meaning, definition functions, credit instruments, deficiencies and recent development in Capital Market in India
			CO4	Understanding the meaning, definition functions, participants and recent development in Foreign Exchange Market.
T.Y.BCOM	356-B	Banking and Finance	**CO1**	Understanding the Banking Regulation Act 1949 with Objectives and selective Provisions. Understanding the Provisions of Negotiable Instruments Act, 1881
			CO2	Understanding the Objectives, Importance, Selective Definitions and Provisions Insolvency and Bankruptcy
			CO3	Understanding the details Banking Ombudsman Scheme, 2006
T.Y.BCOM	355 – e	Cost and Works Accounting	**CO1**	To remember and understand the concept of overhead and classification of overheads
			CO2	Understanding the significance of overheads in the total cost of product/service.
			CO3	Ability to understand the stages in the process of accounting overheads.
			CO4	Application of accounting treatment for under and over absorption.
			CO5	Knowledge about detection of overheads to different activities

T.Y.BCOM	356-E	Works Accounting III	**CO1**	Development of overall outlook of Marginal Costing.
			CO2	Develop the knowledge about preparation of various types Budgets
			CO3	Understand the implementation n of Interfere comparison
			CO4	Understand the implementation n of modern costing environment
T.Y.BCOM	355 (h)	Marketing Management-II	**CO1**	To equipped with a comprehensive understanding of the key factors in demand and sales forecast.
			CO2	Familiarizing the students with the application of the concept & need of marketing in Non-profit organization.
			CO3	Understanding marketing organization and its changing role
			CO4	Understanding the concept and importance of Building Brand Strategy, as well as its relationship in reviewing to competitive advantage
T.Y.BCOM	356(H)	Marketing Management-III	**CO1**	Student will understand the concept of advertising and advertising media
			CO2	To enable them to analyze and interpret
			CO3	To enable the students to study the Appeals and Approaches in Advertisement
			CO4	It will help the students to apply the various Economic and social aspects of advertising.
			CO5	It will help them to implement this knowledge in practical situations by enhancing their skills in the field of Marketing

Anjuman Khairul Islam's
POONA COLLEGE
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• Affiliated to Savitribai Phule Pune University: ID No PU/PN/ASC/023/1970
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• Government of Maharashtra and Savitribai Phule Pune University Recognized Minority College
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POST GRADUATE COURSE OUTCOMES

Name of the Programme: M.Sc. (Computer Science)

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
M.Sc. I	CS-501-MJ	Advanced Operating System	CO1	CO1: Understand the Operating Systems Structure with example of Unix/Linux.
			CO2	Learn the structure of files and directory in UNIX/LINUX OS.
			CO3	Use various system calls related to file subsystem.
			CO4	Learn the process control subsystem structure in UNIX/LINUX OS
			CO5	Use various system calls related to process control subsystem.
			CO6	Learn the concept of signal handling with practical implementation
			CO7	Understand the memory management policies of UNIX/LINUX OS
M.Sc. I	CS-502-MJ	Artificial Intelligence	CO1	Understand the fundamental concepts of Artificial Intelligence.
			CO2	Identify and apply appropriate search strategies for AI problem.
			CO3	Identify knowledge and represent AI algorithms using various techniques.
			CO4	Implement ideas to design and develop AI solutions for complex challenges.
			CO5	Analyse the performance of AI models and interpret their results.
			CO6	Implement ideas underlying modern logical inference systems.
			CO7	Understand recent trends and future scope of AI.

M.Sc. I	CS-503-MJ	Principles of Programming Language	CO1	Separate syntax from semantics
			CO2	Compare programming language designs
			CO3	Understand their strengths and weaknesses
			CO4	Learn new languages more quickly
			CO5	Understand basic language implementation techniques
			CO6	Learn small programs in different programming Languages
M.Sc. I	CS-504-MJP	Lab Course on CS-501-MJ (Advanced Operating System)	CO1	Understand the Operating Systems Structure with example of Unix/Linux.
			CO2	Learn the structure of files and directory in UNIX/LINUX OS.
			CO3	Use various system calls related to file subsystem.
			CO4	Learn the process control subsystem structure in UNIX/LINUX OS
			CO5	Use various system calls related to process control subsystem.
			CO6	Learn the concept of signal handling with practical implementation
M.Sc. I	CS-505-MJP	Lab Course on CS-502-MJ (Artificial Intelligence)	CO1	Understand the fundamental concepts of Artificial Intelligence.
			CO2	Identify and apply appropriate search strategies for AI problem.
			CO3	Identify knowledge and represent AI algorithms using various techniques.
			CO4	Implement ideas to design and develop AI solutions for complex challenges.
			CO5	Analyze the performance of AI models and interpret their results.
			CO6	Implement ideas underlying modern logical inference systems.
			CO7	Understand recent trends and future scope of AI.
M.Sc. I	CS-510-MJ	Advance Databases and Web Technologies	CO1	Students will get knowledge of advance database technology
			CO2	Students will be able to choose appropriate database technology as per application
			CO3	Students will learn to design responsive web application
			CO4	Students could design and implement scalable web application
M.Sc. I	CS-511-MJP	Lab Course on CS-510-MJ (Advance Databases and Web Technologies)	CO1	Students will get knowledge of advance database technology
			CO2	Students will be able to choose appropriate database technology as per application
			CO3	Students will learn to design responsive web application

			CO4	Students could design and implement scalable web application
M.Sc. I	CS-512-MJ	Cloud Computing	CO1	To understand the principles of cloud computing
			CO2	To understand the importance of virtualization and how it has helped the development of cloud computing.
			CO3	To understand the concept of cloud security.
			CO4	To design and deploy cloud infrastructure.
			CO5	To understand the concept of edge computing
M.Sc. I	CS-513-MJP	Lab Course on CS-512-MJ (Cloud Computing)	CO1	To understand the principles of cloud computing
			CO2	To understand the importance of virtualization and how it has helped the development of cloud computing.
			CO3	To understand the concept of cloud security.
			CO4	To design and deploy cloud infrastructure.
M.Sc. I	CS-514-MJ	C# .NET Programming	CO1	Understand the features of Dot Net Framework along with the features of C#
			CO2	Interpret and Develop Interfaces for real-time applications.
			CO3	Design & implement Object Oriented Programming concepts like Inheritance and Polymorphism in C# programming language.
			CO4	Design & Implement the application using multithreading & File handling
			CO5	Design and Implement Windows Application using Windows Forms & tools application using Database in C#
			CO6	Design and Implement Custom Application Using Windows Form & ADO.NET in C#
M.Sc. I	CS-515-MJP	Lab Course on CS-514-MJ (C# .NET Programming)	CO1	Understand the features of Dot Net Framework along with the features of C#
			CO2	Interpret and Develop Interfaces for real-time applications.
			CO3	Design & implement Object Oriented Programming concepts like Inheritance and Polymorphism in C# programming language.
			CO4	Design & Implement the application using multithreading & File handling
			CO5	Design and Implement Windows Application using Windows Forms & tools application using Database in C#
			CO6	Design and Implement Custom Application Using Windows Form & ADO.NET in C#
M.Sc. I	CS-531-RM	Research Methodology	CO 1	Understand of the fundamental concepts of research, including the research process, research questions, hypotheses, and variables.

			CO 2	Conduct a comprehensive literature review to identify relevant studies, synthesize existing knowledge, and identify research gaps.
			CO 3	Identify research problems, formulate research questions, and design appropriate methodologies to address these problems
			CO 4	Identify and select appropriate research designs, such as experimental, observational, survey, qualitative, or mixed-methods, based on the research objectives.
			CO 5	Apply appropriate data analysis methods, including statistical techniques or qualitative analysis, to draw meaningful conclusions from research data.
			CO 6	Develop a well-structured research proposal, outlining research questions, methodology, expected outcomes, and a rationale for the study.
			CO 7	Communicate research findings effectively through written reports, presentations, and academic papers.
			CO 8	Gain an appreciation for the importance of research in contributing to the advancement of knowledge in their field of study and broader society.
			CO 9	Understand the principles of research ethics and integrity and apply them in their research.
SEMESTER II				
M.Sc. I	CS-551-MJ	Design and Analysis of Algorithms	CO1	Analyze worst-case running times of algorithms using asymptotic analysis.
			CO2	Compare between different data structures. Pick an appropriate data structure for a design situation.
			CO3	Ability to design algorithms using standard paradigms like: Greedy, Divide and Conquer, Dynamic Programming and Backtracking.
			CO4	Able to Explain the major graph algorithms and Employ graphs to model engineering problems, when appropriate.
			CO5	Able to compare between different data structures and pick an appropriate data structure for a design situation.
M.Sc. I	CS-552-MJ	Mobile App Development Technologies	CO 1	To provide students with a solid understanding of the mobile app development, Android operating system, its architecture, components, and the software development kit (SDK).
			CO 2	To teach students how to build Android applications from scratch, including UI design, handling user interactions, and integrating various features.

			CO 3	To learn about Android's UI components, layouts, and design principles to create visually appealing and user-friendly interfaces.
			CO 4	To know various methods of data storage in Android applications, such as using SQLite databases, shared preferences, and cloud-based solutions.
			CO 5	To empower students to independently design, develop, and deploy their Android applications using advanced android tools.
			CO 6	To understand how to utilize built-in sensors and hardware components on Android devices, such as GPS, accelerometer, Bluetooth, WiFi, Media Player and Camera, in their applications.
			CO 7	To Get knowledge of Phone Gap Programming
M.Sc. I	CS-553-MJ	Software Project Management	CO1	Learn the skills that are required to ensure successful medium and large scale software projects.
			CO2	Examine Requirements Elicitation, Project Management, Verification &Validation and Management of Large Software Engineering Projects.
			CO3	Get knowledge to select and apply project management techniques for process modeling, planning, estimation, process metrics and risk management.
			CO4	Understand the concepts, skills, tools, and techniques of software project management.
M.Sc. I	CS-554-MJP	Lab Course on CS-551-MJ (Design and Analysis of Algorithms)	CO1	Analyze worst-case running times of algorithms using asymptotic analysis.
			CO2	Compare between different data structures. Pick an appropriate data structure for a design situation.
			CO3	Ability to design algorithms using standard paradigms like: Greedy, Divide and Conquer, Dynamic Programming and Backtracking.
			CO4	Able to Explain the major graph algorithms and Employ graphs to model engineering problems, when appropriate.
			CO5	Able to Compare between different data structures and pick an appropriate data structure for a design situation.
M.Sc. I	CS-555-MJP	Lab Course on CS-552-MJ (Mobile App Development Technologies)	CO1	To teach students how to build Android applications from scratch, including UI design, handling user interactions, and integrating various features.
			CO2	To learn about Android's UI components, layouts, and design principles to create visually appealing and user-friendly interfaces.

			CO3	To empower students to independently design, develop, and deploy their Android applications using advanced android tools.
M.Sc. I	CS-560-MJ	Full Stack Development-I	CO1	Learn about the benefits of using MEAN stack and how to install and configure it
			CO2	Learn advanced ES6 features in JavaScript and Typescript
			CO3	Learn about Angular architecture, components, directives, pipes, forms, routing, and services.
			CO4	Learn about the event loop, asynchronous programming, modules, packages, and streams.
			CO5	Learn about the MVC pattern, routing, HTTP requests and responses, middleware, and error handling.
			CO6	Create a full-stack MEAN stack application and deploy it to a production/local server.
M.Sc. I	CS-561-MJP	Lab Course on CS-560-MJ (Full Stack Development-I)	CO1	Describe appropriate uses for JavaScript and PHP
			CO2	Discuss, create, and debug semantically correct basic examples of dynamic web pages
			CO3	Construct individual components and entire applications using ReactJS
			CO4	Build an interactive web page using ReactJS
M.Sc. I	CS-562-MJ	Web Services	CO1	Understand the web services and SOA
			CO2	Understand Web Services Architecture.
			CO3	Understand the working of SOAP and developing SOAP Web Services using Java.
			CO4	To get acquainted with the details of web services technologies like WSDL, UDDI.
			CO5	To understand the concept of RESTful services.
M.Sc. I	CS-563-MJP	Lab Course on CS-562-MJ (Web Services)	CO1	Understand the web services and SOA
			CO2	Understand Web Services Architecture.
			CO3	Understand the working of SOAP and developing SOAP Web Services using Java.
			CO4	To get acquainted with the details of web services technologies like WSDL, UDDI.
			CO5	To understand the concept of RESTful services.
M.Sc. I	CS-564-MJ	ASP .NET Programming	CO1	Understand the features of Dot Net Framework along with the features of ASP
			CO2	Interpret and Develop Interfaces for real-time applications.
			CO3	Design & implement Object Oriented Programming concepts like Inheritance and Polymorphism in ASP programming language.
			CO4	Design & Implement the application using multithreading & File handling
			CO5	Design and Implement Windows Application using Windows Forms & tools application using Database in ASP

			CO6	Design and Implement Custom Application Using Windows Form & ADO.NET in ASP
M.Sc. I	CS-565-MJP	Lab Course on CS-564-MJ (ASP .NET Programming)	CO1	Understand the features of Dot Net Framework along with the features of ASP
			CO2	Interpret and Develop Interfaces for real-time applications.
			CO3	Design & implement Object Oriented Programming concepts like Inheritance and Polymorphism in ASP programming language.
			CO4	Design & Implement the application using multithreading & File handling
			CO5	Design and Implement Windows Application using Windows Forms & tools application using Database in ASP
			CO6	Design and Implement Custom Application Using Windows Form & ADO.NET in ASP
M.Sc. I	CS-581-OJT	On Job Training (Internship)	CO1	Enhance the knowledge related to various tools and technologies used in industry
			CO2	Improve the ability to solve complex problems independently and creatively
			CO3	Effectively utilize critical thinking and analytical skills in tackling real world challenges
			CO4	Effectively communicate and collaborate skills through interaction with team members and mentors.
			CO5	Get an experience in working on projects or related working within industry
			CO6	Develop the ability to document process, design, implementation and testing
			CO7	Familiar with specific industry domain relevant to internship
			CO8	Complete projects and tasks as per the predetermined objectives
SEMESTER III				
M.Sc. II	CS-601-MJ	Software Architecture and Design Pattern	CO1	Understand the UML basics, RUP and basics of software architecture
			CO2	Acknowledge the traits of patterns that make them helpful in solving real-world issues.
			CO3	Able to use specific frameworks as per applications need.
			CO4	Design java application using design pattern techniques
M.Sc. II	CS-602-MJ	Machine Learning	CO1	To introduce knowledge of Machine Learning.
			CO2	To demonstrate all categories of Machine learning algorithms along with implementation.
			CO3	To compose real time application using machine learning algorithms.

			CO4	Analyze the concept of neural networks for learning linear and non-linear activation functions.
M.Sc. II	CS-603-MJ	Internet of Things	CO1	Demonstrate basic concepts, principles and challenges in IoT.
			CO2	Illustrate functioning of hardware devices and sensors used for IoT.
			CO3	Analyze network communication aspects and protocols used in IoT.
			CO4	Apply IoT for developing real life applications using Ardunio programming.
			CO5	To develop IoT infrastructure for popular applications.
M.Sc. II	CS-604-MJP	Lab Course on CS-601-MJ and CS-603-MJ (Software Architecture & Design Pattern and Internet of Things)	CO1	Design java application using design pattern techniques.
			CO2	Apply IoT for developing real life applications using Ardunio programming.
			CO3	To develop IoT infrastructure for popular applications.
M.Sc. II	CS-605-MJP	Lab course on CS-602-MJ (Machine Learning)	CO1	To Get Hands on machine learning model.
			CO2	Able to estimate Machine Learning models efficiency using suitable metrics.
			CO3	Able to analysis and make decision for critical problems.
			CO4	Able to handle structured, unstructured as well as semi-structured data.
			CO5	Implement ideas to design and develop Deep learning solutions for complex problems
M.Sc. II	CS-610-MJ	Full Stack Development-II	CO1	Learn In Depth understanding of Angular framework and State Management.
			CO2	Learn using typescript effectively in Angular framework.
			CO3	Learn in-depth knowledge of NodeJS and Express JS.
			CO4	Learn advance concepts in MongoDB.
			CO5	Learn best practices to be followed when creating industry grade applications.
M.Sc. II	CS-611-MJP	Lab course on CS-610-MJ (Full Stack Development-II)	CO1	Learn In Depth understanding of Angular framework and State Management.
			CO2	Learn using typescript effectively in Angular framework.
			CO3	Learn in-depth knowledge of NodeJS and Express JS.
			CO4	Learn advance concepts in MongoDB.
			CO5	Learn best practices to be followed when creating industry grade applications.

M.Sc. II	CS-612-MJ	DevOps Fundamentals	CO1	Apply DevOps principles for collaboration, automation, and continuous improvement.
			CO2	Master version control (e.g., Git) and implement effective branching strategies.
			CO3	Design and optimize CI/CD pipelines for automated and streamlined software delivery.
			CO4	Utilize containerization (e.g., Docker) and orchestration tools (e.g., Kubernetes) for scalable deployments.
			CO5	Implement monitoring, logging, and security practices throughout the DevOps lifecycle.
			CO6	Foster effective collaboration through tools like ChatOps within cross-functional teams.
			CO7	Develop skills in incident response, troubleshooting, and problem resolution.
M.Sc. II	CS-613-MJP	Lab Course on CS-612-MJ (DevOps Fundamentals)	CO1	Demonstrate the ability to practically implement DevOps principles through hands-on assignments in version control, CI/CD, IaC, and containerization
			CO2	Develop problem-solving skills by resolving simulated incidents, enhancing the understanding of incident response and troubleshooting procedures.
			CO3	Attain a comprehensive skill set covering automation, scripting, collaboration tools, and cultural transformation
			CO4	Empowering participants to contribute to a collaborative and efficient DevOps culture.
M.Sc. II	CS-614 MJ	Soft Computing	CO1	Learn about soft computing techniques and their applications
			CO2	Analyze various neural network architectures and perceptrons
			CO3	Define the fuzzy systems
			CO4	Analyze the genetic algorithms and their applications.
M.Sc. II	CS-615-MJP	Practical on CS-614-MJ (Soft Computing)	CO1	Learn about soft computing techniques and their applications
			CO2	Analyze various neural network architectures and perceptrons
			CO3	Define the fuzzy systems
			CO4	Analyze the genetic algorithms and their applications.
M.Sc. II	CS-631-RP	Research Work-I	CO1	Independently conduct research in a specific area of computer science
			CO2	Apply appropriate research methodologies to address research problems.
			CO3	Analyze and synthesize information gathered from literature reviews, experiments, or data analysis

			CO4	Develop innovative solutions to research problems within the scope of computer science.
			CO5	Effectively present research findings through written reports, oral presentations, or poster presentations.
			CO6	Publish research work in reputable journals, present at conferences or in recognized project competitions.
SEMESTER IV				
M.Sc. II	CS-651-MJP	Full Time Industrial Training (IT)	CO1	Apply theoretical concepts learned in the classroom to solve practical problems encountered in an industrial setting.
			CO2	Demonstrate proficiency in using industry-standard tools, technologies, and methodologies relevant to their area of specialization.
			CO3	Apply analytical and problem-solving skills to address challenges encountered during the industrial training
			CO4	Collaborate effectively with team members to achieve project goals and objectives.
			CO5	Manage time and resources efficiently to complete assigned tasks and projects within the stipulated timeframe.
			CO6	Prepare a comprehensive report documenting their experience, including project details, learnings, and reflections.
M.Sc. II	CS-681-RP	Research Work-II	CO1	Independently conduct research in a specific area of computer science
			CO2	Apply appropriate research methodologies to address research problems.
			CO3	Analyze and synthesize information gathered from literature reviews, experiments, or data analysis
			CO4	Develop innovative solutions to research problems within the scope of computer science.
			CO5	Effectively present research findings through written reports, oral presentations, or poster presentations.
			CO6	Publish research work in reputable journals, present at conferences

SEMESTER III				
M.COM-II	301	Business Finance	**CO1**	Students will be able to understand the role and importance of corporate finance, and learn the calculation value of money.
			CO2	Students will be able to understand the financial planning, theories of capitalization and estimation of finance need of firm.
			CO3	Students will be able to learn the sources of finance to be tapped for running business successfully.
			CO4	Students will be able to apply best practice in working capital management.
M.COM-II	302	Research Methodology For Business	**CO1**	Students will be able to understand the role and importance of corporate finance, and learn the calculation value of money.
			CO2	Students will be able to understand the financial planning, theories of capitalization and estimation of finance need of firm.
			CO3	Students will be able to learn the sources of finance to be tapped for running business successfully.
			CO4	Students will be able to apply best practice in working capital management.
M.COM-II	303	Advanced Auditing Group-A	**CO1**	To develop the knowledge about auditing standard.
			CO2	To know about the practice of Company Auditor
			CO3	Develop knowledge about Corporate Governance and audit

				committee
			CO4	Use of computer in audit
M.COM-II	304	Specialized Auditing Group-A	**CO1**	Student must able to understand new concept of auditing
			CO2	Student must able to understand process of internal audit
			CO3	Student must able to understand auditing in banks
			CO4	Students should know the application of auditing in cooperative sector in country like India
M.COM-II	307	Cost Audit Group-C	**CO1**	Understand importance of cost audit
			CO2	Understand the role and responsibility of cost auditor
			CO3	Able to prepare plan for cost audit Able to understand how to draft Cost Audit Report.
M.COM-II	308	Management Audit Group-C	**CO1**	Understanding importance of management Audit
			CO2	Understanding The Procedure Of Management Audit
			CO3	Understanding Corporate Image In Management Audit
			CO4	Able To Understand Different Areas Of Management Audit
			CO5	Help To Understand Operational Audit.
M.COM-II	313	Human Resource Management Group-F	**CO1**	The student will be able to understand The Definition and meaning of Human Resource Management, its Concept, Approaches, Functions ▪ Can identify that the HRM is profession or not. ▪ Able to cope with the concept Human Resource Environment. ▪ Place of female employee in the organization. ▪ Identify the changing Role of Human Resource Management.
			CO2	The Objectives of Human Resource Planning and Development. ▪ Need and Estimation for Human Resource Planning and Development. ▪ Can understand the recruitment and selection process. ▪ Understand the concept of Retention of Manpower, Succession Planning
			CO3	Kinds of Retirement, Resignation, Discharge, Dismissal, Suspension, Lay off. ▪ Identify he recent trends in HRM
M.COM-II	314	Organizational Behaviour	**CO1**	The Definition and meaning of organizational Behaviour Able to cope with the role of technology in organization. Describe the

				theoretical and conceptual framework of Organizational Behavior ▪ Analyze the impact of globalization
			CO2	To be understand the Concept and characteristics of Emotional Intelligence
			CO3	To be well acquainted with Emotional intelligence in the Workplace
			CO4	To understand the meaning and Causes of Stress ▪ Get detail knowledge about the Conflict ▪ To be understand Concept and Types of Group and Team building
SEMESTER IV				
M.COM-II	401	Financial Services 401	**CO1**	Students will be able to learn the importance and working of capital market.
			CO2	Student will be able to understand the working of BSE and NSE, and OTCEI in detail.
			CO3	Students will be able to know the role of inter-mediatories, Mutual funds. Portfolio management.
			CO4	Students will be able to know the role of SEBI in regulating stock exchanges and investors' education, financial advisors.
M.COM-II	402	Industrial Economic Environment	**CO1**	Will understand the impact of economic and non – economic factors affecting industrial environment
			CO2	Will understand role of various types of industries in India like small scale industries, public sector industries, MNCs etc.
			CO3	Critically evaluate industrial polices in India
			CO4	Analyze the impact of new industrial policy adopted by India
			CO1	Will understand role, progress and problems of manufacturing and service industries in India
M.COM-II	403	Recent Advances in Accounting, Taxation & Auditing Group-A	**CO1**	Students will know the professionalism in Accounting process
			CO2	Students will understand the benefit of new reforms among different stakeholders.
			CO3	Students will understand the application of new accounting methods for better efficacy building
			CO4	Students will understand the need for emerging trends in

				accountancy
M.COM-II	407	: Recent Advances in Cost Auditing and Cost System	**CO1**	Understand Cost Accounting Standards in depth Audit
			CO2	Understand GST and Productive Audit
			CO3	Understanding ERP
			CO4	Able to understand different areas of recent changes
M.COM-II	413	Recent Advances in Business Administration	**CO1**	Can identify dimensions Approaches towards managing change. Able to cope with the futuristic and Strategic approaches due technology.
			CO2	Able to know the challenges before customer centric organization ▪ Identify the best practices and way to measure the success of customer centric company.
			CO3	Able to Know the cross cultural Management issues. ▪ Able to identify to aquatint the role, importance and current trends in merger
			CO4	Identify the prerequisite for success. ▪ Able to identify the concept and significance of Restructuring and Reengineering of Business. ▪ Able to cope with the steps of innovation management. And also the role of various institution for promoting.

Name of the Programme: B.B.A.

Name of the Class	Course Code	Course Title	Course Outcome	
SEMESTER I				
F.Y.B.B.A.	101	Business Organisation & System	**CO1**	Students shall be able to explain why information systems are so important today for business and management.
			CO2	Students shall have the knowledge of the different forms of Business systems
			CO3	Students shall develop the spirit of entrepreneurship among the students.
			CO4	Students shall have the knowledge of Domestic and Foreign Trade.
	102	Business Communication Skills	**CO1**	Students shall improvise their skills such as linguistic, non-linguistic and Paralinguistic skills.
			CO2	Students shall develop integrative approach where reading, writing, oral and speaking components are used together to enhance the students' ability to communicate and write effectively.
			CO3	Students shall be aware about various Methods and Media of communication.
	103	Business Accounting	**CO1**	The students have acquired sound knowledge of basic concepts of accounting.
			CO2	Students also understood about recording of transactions and preparation of final accounts.
			CO3	Students got exposure about various accounting software packages.

	104	Business Economics (Micro)	**CO1**	Students shall understand how households (demand) and businesses (supply) interact in various market structures to determine price and quantity of a good produced.
			CO2	Students shall understand the links between household behavior and the economic models of demand
			CO3	Students shall represent demand, in graphical form, including the downward slope of the demand curve and what shifts the demand curve.
			CO4	Students shall understand the links between production costs and the economic models of supply.
			CO5	Students shall represent supply, in graphical form, including the upward slope of the supply curve and what shifts the supply curve.
			CO6	Students shall understand how different degrees of competition in a market affect pricing and output.
	105	Business Mathematics	**CO1**	Students shall understand applications of matrices in business.
			CO2	Students shall understand the concept and application of Permutations& Combinations in business.
			CO3	Students shall use L.P.P. and its applications in business.
			CO4	Students shall understand the concept of Transportation problems & its applications in business world.
			CO5	Students shall understand the concept of shares & share market.
	106	Business Demography and Environmental Studies	**CO1**	Students shall understand Distribution of Population and Population Growth.
			CO2	Students shall be aware regarding Environment and Environmental issues related to Business

			CO3	Students shall understand the problems of urbanization
SEMESTER II				
F.Y.B.B.A.	201	Principles of Management	**CO1**	Students shall demonstrate an understanding of effective management principles as outlined in selected text learning objectives.
			CO2	Students shall apply effective management strategies, principles and techniques.
			CO3	Students shall demonstrate research and analytical skills by using both human and technological resources
			CO4	Students shall demonstrate the ability to communicate effectively.
	202	Principles of Marketing	**CO1**	Students shall get familiar to basic concepts of marketing, it's general nature, scope and importance.
			CO2	Students shall receive appropriate knowledge and understanding of its primary functions and applications and its gradual evolution and development.
			CO3	Students shall develop basic and essential skills related to marketing.
			CO4	Students shall get a learning platform for preparing for marketing employability opportunities essential for industries.
	203	Principles of Finance	**CO1**	Students understood the nature, importance, structure of finance related areas.
			CO2	Knowledge regarding sources of finance for a business.
	204	Basics of Cost Accounting	**CO1**	Students got the Knowledge of Basic cost concepts, element of cost & preparation of Cost Sheet.
			CO2	Basic knowledge of important Methods of costing was given to the students.

	205	Business Statistics	**CO1**	Students shall be able to understand the basics of statistics – concept of population and sample & to use frequency distribution to make decision.
			CO2	Students shall be able to understand and calculate various types of averages and variation.
			CO3	Students shall be able to understand Correlation and use of regression analysis to estimate the relationship between two variables and its applications.
			CO4	Students shall be able to understand the concept – Time Series and its applications in business.
			CO5	Students shall be able to understand the concept – Index numbers and applications in business.
			CO6	Students shall be able to imbibe research culture among students.
	206	Business Informatics	**CO1**	Students shall know the basics of Computer
			CO2	Student shall understand the basics of networking
			CO3	Student shall the basics of internet.
			CO4	Student shall the basics of databases.
SEMESTER III				
S.Y.B.B.A.	301	Personality Development	**CO1**	Students shall be aware about the dimensions and importance of effective personality
			CO2	Students shall understand personality traits and formation and vital contribution in the world of business
			CO3	Students shall get aware about various dynamics of personality development

	302	Business Ethics	**CO1**	Students shall get knowledge of Business Ethics
			CO2	Students shall witness promotions of Ethical Practices in the Business
			CO3	Students shall develop Ethical and Value Based thought process among the future manager's entrepreneurs
S.Y.B.B.A.	303	Human Resource Management and Organisation Behaviour	**CO1**	Students studying HRM /OB acquire the knowledge, critical thinking, and practical skills that will enable them to create organizational effectiveness, lead human resources management strategies, and enhance the human condition at work.
			CO2	HRM/OB students learn to think critically about the challenges involved in creating high performance workplaces where innovation, diversity, and ethical behaviour are valued and rewarded.
			CO3	HRM/OB Majors are educated in Human Resources Management (HRM), Organizational Behaviour (OB) and Industrial Relations (IR).
S.Y.B.B.A.	304	Management Accounting	**CO1**	Students got the basic knowledge of Management Accounting.
			CO2	To know the implications of various financial ratios in decision making.
			CO3	Significance of working capital in business.
			CO4	Students got the concept of budgetary control and its application in business.
			CO5	Students got the calculating ability of various techniques of management accounting.
S.Y.B.B.A.	305	Business Economics	**CO1**	Students shall study the behavior of working of the economy as a whole.

		(Macro)	**CO2**	Students shall develop an analytical framework to understand the inter-linkages among the crucial macroeconomic variables.
			CO3	Students shall apply economic reasoning to problems of business and public policy.
S.Y.B.B.A.	306	I.T. in Management	**CO1**	The study describes the role of information systems in business.
			CO2	It studies the current issues of information technology and relate those issues to the firm.
SEMESTER IV				
S.Y.B.B.A.	401	Production and Operations Management	**CO1**	Students shall identify and articulate how operations management contributes to the achievement of an organization's strategic objectives.
			CO2	Students shall critically evaluate the operations function in manufacturing and service production settings.
			CO3	Students shall appraise and apply forecasting methods as the basis of management's planning and control activity.
			CO4	Students shall assess and formulate decision making strategies to address operating issues that have short, intermediate or long lead times.
			CO5	Students shall evaluate approaches to problem solving and process improvement in production settings.
	402	Industrial Relations & Labour Laws	**CO1**	Students understood the relationship between Labour and Management.
			CO2	Resolving of Industrial disputes and Grievances
			CO3	Students understood the laws which effects the industry and Labour
	403	Business Taxation	**CO1**	Students got to understand the basic concepts and definitions under the Income Tax Act, 1961.

			CO2	Students were given latest development in the subject of taxation.
			CO3	Acquired knowledge about Computation of Income under different heads of Income of Income Tax Act, 1961.
			CO4	Acquired knowledge about the submission of Income Tax Return, Advance Tax, Tax deducted at Source, Tax Collection Authorities.
			CO5	Students became Competent enough to take up to employment in Tax planner.
			CO6	To develop ability to calculate taxable income of firms, co-operative societies and charitable trust.
S.Y.B.B.A.	404	International Business	**CO1**	Students shall get acquainted with emerging issues in international business
			CO2	Students shall study the impact of international business environment on foreign market operations
			CO3	Students shall understand the importance of foreign trade for Indian economy.
S.Y.B.B.A.	405	Management Information System	**CO1**	Students became Competent enough to understand the concepts of Information System
			CO2	Understood the concepts of system analysis and design
			CO3	Students understood the issues in MIS.
S.Y.B.B.A.	406	Business Exposure (Field Visits)	**CO1**	Students shall develop their understanding with a realistic and practical perception of the industry its layout, procedures, processes, organization structure.
			CO2	Students shall gain firsthand information regarding the functioning of the Industry which presents the students with opportunities to plan, organize and engage in active learning experiences both inside and outside the classroom.
SEMESTER V				

T.Y.B.B.A.	501	Supply Chain and Logistics Management	**CO1**	Upon successful completion of program students able to 1. Describe major logistics functions and activities.
			CO2	Differentiate logistics and supply chain management.
			CO3	Describe methods of inventory planning.
			CO4	Explain how technology has and continues to change logistics and supply chain management
			CO5	Compare modes of transportation.
			CO6	Describe warehouse processes, systems, and performance measures.
			CO7	Describe documentation and terms of sale for international shipments.
	502	Entrepreneurship Development	**CO1**	Graduate Entrepreneurship Students will be able to … Demonstrate a fundamental comprehension of business opportunity evaluation, from the perspective of a prospective investor.
			CO2	Identify the most recognized sources of potential funding and financing for business start-ups and/or expansion.
			CO3	Demonstrate extemporaneous speaking skills developed through in-class discussion of text materials, case study analyses, and current entrepreneurship-related issues.
			CO4	Assess their own personal work products creativity and how those could apply to their own real life, future business ventures.
	503	Business Law	**CO1**	Students understood basic legal terms and concepts used in law pertaining to business
			CO2	Applicability of legal principles to situations in Business world.
	504	Research Methodology (Tools and Analysis)	**CO1**	Students shall gain basic understanding of research process and tools for the same.
			CO2	Students shall gain understanding of the tools and techniques necessary for research and report writing.

	505A	Analysis of Financial Statements	**CO1**	Students learnt the interpretation and analysis of financial statements effectively.
			CO2	The student got well acquainted with current financial practices
			CO3	Students became intensive users of financial statements as part of their professional responsibilities.
	505B	Sales Management	**CO1**	Students shall demonstrate an understanding of the role that a sales force plays in marketing strategies
			CO2	Students shall describe the selling process.
			CO3	Students shall Understand the factors that affect sales force success.
			CO4	Students shall identify and explain the processes involved in recruiting, selecting, training, motivating, compensating, and retaining salespeople.
	505C	HRM Principles & Functions	**CO1**	Students shall understand HR Recruitment and Selection.
			CO2	Students shall get aware about Training, development and evaluation system in HR
			CO3	Students shall understand how to prepare Personnel records reports and audit.
			CO4	Students shall study in detail New trends in HRM and exit policy
	506A	Long Term Finance	**CO1**	Students got the capability to make long-term financing.
			CO2	Students were well-acquainted regarding current financial structure.
	506B	Retail Management	**CO1**	Compare and contrast traditional retailers and category specialists Describe how technology (e.g., customer databases, integrated systems, and buying and sales forecasting systems) is used to support retail businesses
			CO2	Evaluate the effectiveness of merchandising decisions in the retail industry Explain the factors relating to visual merchandising, such as store layouts and presentation Compare

				the strategies that are used within the different stages of a product's life cycle
			CO3	Students shall describe the flow of goods and services in a retail environment.
	506C	Human Resource Practices	**CO1**	Students shall get introduced to Strategic HRM
			CO2	Students shall understand Working Conditions & Welfare
			CO3	Students shall understand Employee Grievance & Discipline
			CO4	Students shall get aware of E- Human Resource studies
SEMESTER VI				
T.Y.B.B.A.	601	Business Planning and Project Management	**CO1**	Students shall learn to manage the scope, cost, timing, and quality of the project, at all times focused on project
			CO2	Students shall align the project to the organization's strategic plans and business justification throughout its lifecycle
			CO3	Students shall identify project goals, constraints, deliverables, performance criteria, control needs.
			CO4	Students shall implement project management knowledge, processes, lifecycle and the embodied concepts, tools and techniques in order to achieve project success
	602	Event Management	**CO1**	Students shall get acquainted with concepts, issues and various aspects of event management.
	603	Management Control System	**CO1**	Students understood the function of management control, its nature, functional areas, and techniques.
	604	E-Commerce	**CO1**	Students shall understand the basic concepts and technologies used in the field of management information systems.
			CO2	Students shall be aware of the ethical, social, and security issues of information systems.
			CO3	Students shall assess the impact of the Internet and Internet technology on business electronic commerce and electronic business.
			CO4	Students shall identify the major management challenges to building and using information systems and learn how to find appropriate solutions to those challenges.

	605A	Financial Services	**CO1**	Students got aware of various financial services and financial markets in India.
	605B	Advertising and Sales Promotion	**CO1**	Students shall develop knowledge and understanding of importance and functions of advertising
			CO2	Students shall understand Key features of Sales Promotion
	605C	Labour Laws	**CO1**	Students shall get an introduction to Labour Laws in India
			CO2	Students shall understand the Acts Such as - The Employees Provident Funds and Miscellaneous Provisions Act,1952; The Child Labour (Prohibition and Regulation) Act,1986; Maternity Benefits Act,1961 and The Employees State Insurance Act,1948.
	606A	Cases in Finance	**CO1**	The students understand and prepare a project report on Various topics of finance.
	606B	Cases in Marketing	**CO1**	Students shall get hands on application of theory by practicing via projects and cases.
	606C	Cases in HRM	**CO1**	Students shall understand the actual application of theoretical aspects and laws by the means of live projects.

Name of the Programme: BBA-CA

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
F.Y.B.B.A (C.A.)	101	Modern Operating Environment and MS Office	**CO1**	The student will be able to recognize when to use each of the Microsoft Office programs to create professional business documents.
			CO2	The student will be able to use Microsoft Office programs to create personal and/or business documents following current professional and/or industry standards
			CO3	The student will be able to pursue future courses specializing in one or more of the programs.
			CO4	The student will be able to apply skills and concepts for basic use of computer hardware, software, networks, and the Internet in the workplace and in future coursework as identified by the internationally accepted Internet and Computing Core (IC3) standards.
F.Y.B.B.A (C.A.)	101 New	Business Communication Skills	**CO1**	The student will be able to understand the role of communication in personal and business world.
			CO2	The student will be able to understand system and communication and their utility
			CO3	The student will be able to develop proficiency in how to write business letters.
F.Y.B.B.A (C.A.)	102	Financial Accounting	**CO1**	The students have acquired sound knowledge of basic concepts of accounting
			CO2	Students also understood about recording of transactions and preparation of final accounts
			CO3	Students got exposure about various accounting software packages.
F.Y.B.B.A (C.A.)	102 New	Principles of Management	**CO1**	The student will be able to understand basic concept regarding org. Business Administration.
			CO2	The student will be able to examining various management principles.
			CO3	The student will be able to develop managerial skills among the students.
F.Y.B.B.A	103	Principles of	**CO1**	The student will be able to apply knowledge

(C.A.)		Programming and Algorithm		of mathematics, science, and engineering
			CO2	The student will be able to learn how to solve common types of computing problems.
			CO3	The student will be able to design and conduct experiments, as well as to analyze and interpret data.
			CO4	The student will be able to design a system, component, or process to meet desired needs within realistic constraints.
			CO5	The student will be able to function on multidisciplinary teams.
F.Y.B.B.A (C.A.)	104	Business Communication	**CO1**	Students shall understand the concept, process and importance of communication
			CO2	Students shall develop an integrative approach where reading, writing, presentation skills are used together to enhance the students' ability to communicate and write effectively
			CO3	Students shall be awareness among students about Methods and Media of communication
			CO4	Students shall get familiar with information technology and improve job seeking skills.
F.Y.B.B.A (C.A.)	105	Principles of Management	**CO1**	The student will be able to understand basic concept regarding org. Business Administration.
			CO2	The student will be able to examining various management principles.
			CO3	The student will be able to develop managerial skills among the students.
F.Y.B.B.A (C.A.)	105 New	Business Statistics	**CO1**	Students will be able to understand role and importance of statistics in various business situations
			CO2	Students will be able to develop skills related with basic statistical technique
			CO3	Students will be able to develop right understanding regarding regression, correlation and data interpretation
F.Y.B.B.A (C.A.)	106	Laboratory Course (Ms. Office, Tally, PPA)	**CO1**	Students will be gain useful knowledge and demonstrate correct application of features of Ms. Office.
			CO2	Students will be able to easily create and edit workbooks having multiple sheets for different purposes and situations.
			CO3	Tally gives the platform to report the

				financial transaction with excessive ease.
			CO4	An ability to design a system, component, or process to meet desired needs within realistic constraints.
SEMESTER II				
F.Y.B.B.A (C.A.)	201	Procedure Oriented Programming using "C"	**CO1**	The student will be able to understand the working of a digital computer.
			CO2	The student will able to analyze a given problem and develop an algorithm to solve the problem
			CO3	The student will able to improve upon a solution to a problem.
			CO4	The student will able to use the 'C' language constructs in the right way.
			CO5	The student will able to design, develop and test programs written in 'C'
F.Y.B.B.A (C.A.)	201 New	Organizational Behavior & Human Resource Management	**CO1**	The student will able to understand basic concept of HRM & OB
			CO2	The student will able to make aware students about traditional & modern methods of procurement & development in organization.
			CO3	The student will able to know the major trends in HRM & OB
F.Y.B.B.A (C.A.)	202	Database Management Systems	**CO1**	The student will able to learn the basic concepts and understand the applications of database systems.
			CO2	The student will able to construct an Entity-Relationship (E-R) model from specifications and to transform to relational model.
			CO3	The student will able to construct unary/binary/set/aggregate queries in Relational Algebra.
			CO4	The student will able to understand and apply database normalization principles.
F.Y.B.B.A (C.A.)	202 New	Financial Accounting	**CO1**	The student will able to develop right understanding regarding role and importance of monetary and financial transactions in business.
			CO2	The student will able to cultivate right approach towards classifications of different transactions and their implications.
			CO3	The student will able to develop proficiency preparation of basic financial as to how to write basis accounting statement - Trading and P&L.
F.Y.B.B.A (C.A.)	203	Organizational Behavior	**CO1**	The students will able to define, explain and illustrate a range of organisational behaviour

				theories.
			CO2	The students will able to analyse the behaviour of individuals and groups in organisations in terms of organisational behaviour theories, models and concepts.
			CO3	The students will able to apply organisational behaviour concepts, models and theories to real life management situations.
			CO4	The students will able to demonstrate a critical understanding of organisational behaviour theories.
			CO5	The students will able to communicate effectively about organisational behaviour theories and their application using appropriate concepts.
			CO6	The students will able to explain group dynamics and demonstrate skills required for working in groups (team building)
F.Y.B.B.A (C.A.)	203 New	Business Mathematics	**CO1**	The students will able to understand role and importance of Mathematics in various business situations and while developing softwares.
			CO2	The students will able to develop skills related with basic mathematical technique
F.Y.B.B.A (C.A.)	204	Computer Applications In Statistics	**CO1**	Students shall understand the power of excel spreadsheet in computing summary statistics.
			CO2	Students shall understand the concept of various measures of central tendency and variation and their importance in business
			CO3	Students shall understand the concept of probability, probability distributions and simulations in business world and decision making.
F.Y.B.B.A (C.A.)	204 New	Relational Data Base	**CO1**	The students will able to understand relational database concepts and transaction management concepts in database system.
			CO2	The students will able to write PL/SQL programs that use: procedure, function, package, cursor and trigger.

F.Y.B.B.A (C.A.)	205	E-Commerce Concepts	**CO1**	The students will able to Describe an example of system architecture for an e-Business.
			CO2	The students will able to identify the major electronic payment issues and options.
			CO3	The students will able to discuss security issues and explain procedures used to protect against security threats.
F.Y.B.B.A (C.A.)	205 New	Web Technology (HTML-JSS-CSS)	**CO1**	The students will able to know & understand concepts of internet programming.
			CO2	The students will able to understand how to develop web based applications using JavaScript.
F.Y.B.B.A (C.A.)	206	Laboratory Course (C- Programming, DBMS and Stat)	**CO1**	Students will be able to Design, develop and test programs written in 'C'
			CO2	Students will be able to easily design and create a good database and use various SQL operations.
			CO3	Students shall understand the power of excel spreadsheet in computing summary statistics.
SEMESTER III				
S.Y.B.B.A (C.A.)	301	Relational Database Management System	**CO1**	The students will be able to understand basic concepts and the applications of database systems
			CO2	The students will able to Understand and apply database normalization principles.
			CO3	The students will be able to understand principles of database transaction management, database recovery, security.
			CO4	The students will be able to understand Functions, Cursors, Triggers and packages.
			CO5	The student will get brief knowledge about SQL Fundamentals.
			CO6	The students will be able to understand Functions, Cursors, Triggers and packages.
			CO7	The students will be able to handle with different Data Base languages
S.Y.B.B.A (C.A.)	301 New	Digital Marketing	**CO1**	The students will be able to give knowledge about using digital marketing in business.
			CO2	The students will be able to make SWOT analysis, SEO optimization and use of various digital marketing tools.
S.Y.B.B.A (C.A.)	302	Data Structure Using C	**CO1**	Students will be able to apply concepts of data structure in various domains like DBMS, etc.
			CO2	Students will be able to handle various operations like creation, insertion, deletion,

				searching, etc. on various data structure.
			CO3	Students will be able to use various data structures like stack, queue, linked list, etc in practically.
			CO4	Students will be able to apply appropriate data structure to specified problem definition.
S.Y.B.B.A (C.A.)	302 New	Data Structure	**CO1**	Students will be able to understand the concepts of ADTs.
			CO2	Students will be able to learn linear data structures – lists, stacks, and queues.
			CO3	Students will be able to understand sorting, searching and hashing algorithms.
			CO4	Students will be able to apply Tree and Graph structures.
S.Y.B.B.A (C.A.)	303	Introduction to Operating System	**CO1**	Students will be able to understand the concepts of operating system and its working.
			CO2	Students will be able to understand various operating systems features
			CO3	Students will be able to understand basic architectural components involved in operating system design
			CO4	Students will be able to understand device and resource management techniques for timesharing and distributed system
			CO5	Students will be able to understand the concept of mutual exclusion, deadlock detection of distributed operating system
S.Y.B.B.A (C.A.)	303 New	Software Engineering	**CO1**	Students will be able to understand System concepts.
			CO2	Students will be able to understand Software Engineering concepts.
			CO3	Students will be able to understand the applications of Software Engineering concepts and Design in Software
S.Y.B.B.A (C.A.)	304	BUSINESS MATHEMATICS	**CO1**	Students shall understand applications of matrices in business
			CO2	Students shall use L.P.P. and its applications in business
			CO3	Students shall understand the concept of Transportation problems & its applications in business world
			CO4	Students shall understand the concept of Profits and loss, loans and EMIs
S.Y.B.B.A (C.A.)	304 New (Option)	Angular - JS	**CO1**	The students will be able to understand Client Side MVC and SPA.
			CO2	The students will be able to explore

				AngularJS Component.
			CO3	The students will be able to develop an AngularJS Single Page Application.
			CO4	The students will be able to create and bind controllers with Javascript.
			CO5	The students will be able to apply filter in AngularJS application.
S.Y.B.B.A (C.A.)	304 New (Option)	PHP	**CO1**	The students will be able to understand how server-side programming works on the web.
			CO2	The students will be able to use PHP built-in functions and creating custom functions.
			CO3	The students will be able to understand POST and GET in form submission.
			CO4	The students will be able to understand how to receive and process form submission data.
			CO5	The students will be able to read and process data in a MySQL database.
S.Y.B.B.A (C.A.)	305	Software Engineering	**CO1**	The students will be able to use the techniques, skills, and modern engineering tools necessary for engineering practice.
			CO2	The students will be able to analyze, design, verifies, validate, implement, apply, and maintain software systems.
			CO3	The students will be able to design and conduct experiments, as well as to analyze and interpret data.
			CO4	The students will be able to identify, formulates, and solves engineering problems.
S.Y.B.B.A (C.A.)	305 New (Option)	Big Data	**CO1**	The students will be able to develop expert knowledge and analytical skills in current and developing areas of analysis statistics, and machine learning
			CO2	The students will be able to identify, develop and apply detailed analytical, creative, problem solving skills.
			CO3	The students will be able to understand comprehensive platform for career development, innovation and further study.

S.Y.B.B.A (C.A.)	305 New (Option)	Block Chain	**CO1**	The students will be able to understand how blockchain systems (mainly Bitcoin and Ethereum) work.
			CO2	The students will be able to securely interact with them.
			CO3	The students will be able to design, build, and deploy smart contracts and distributed applications.
			CO4	The students will be able to integrate ideas from blockchain technology into their own projects
S.Y.B.B.A (C.A.)	306	Computer Laboratory and Practical Work (D.S + RDBMS)	**CO1**	Student will be able to solve the practical problem using Data Structure using C and Relational Database Management System
			CO2	Students will be able to implement and summarize concepts of searching and sorting techniques.
			CO3	Students will be able to write well-structured program using procedure oriented design principles.
			CO4	Students will be able to analyze run-time execution of application.
			CO5	Students will be able to implement the Stack ADT using array and linked list data structures.
S.Y.B.B.A (C.A.)	AECC Add-On Course	Basic Course in Environmental Awareness	**CO1**	Students will be able to provide an opportunities to acquire the knowledge, values, attitudes, commitment, and skills needed to protect and improve the environment.
			CO2	Students will be able to develop conscious towards a cleaner and better managed environment.
SEMESTER IV				
S.Y.B.B.A (C.A.)	401	Object Oriented Programming Using C++	**CO1**	Students will be able to understand features of object oriented programming.
			CO2	Students will be able to produce object-oriented software using C++
			CO3	Students will be able to apply the major object-oriented concepts in programming
			CO4	Students will be able to understand the

				advanced features of C++ such as stream I/O, Templates, Operator Overloading, etc.
S.Y.B.B.A (C.A.)	401 New	Networking	**CO1**	Students will be able to gain knowledge about Computer Networks concepts.
			CO2	Students will be able to know about working of networking models, addresses, transmission medias and connectivity devices.
			CO3	Students will be able to acquire information about network security and cryptography.
S.Y.B.B.A (C.A.)	402	Programming in Visual Basic	**CO1**	Students will be able to understand the basics of visual basic and its implementation
			CO2	Students will be able to develop Graphical User Interface based on problem specified
			CO3	Students will be able to develop and debug application very easily
S.Y.B.B.A (C.A.)	402 New	Object Oriented Concepts Through CPP	**CO1**	Students will be able to acquire an understanding of basic object-oriented concepts and the issues involved in effective class design.
			CO2	Students will be able to enable students to write programs using C++ features like operator overloading, constructor and destructor, inheritance, polymorphism and exception handling.
S.Y.B.B.A (C.A.)	403	Computer Networking	**CO1**	Students will be able to identify the different components in a Communication System and their respective roles.
			CO2	Students will be able to describe the technical issues related to the local Area Networks.
			CO3	Students will be able to identify the common technologies available in establishing LAN infrastructure.
S.Y.B.B.A (C.A.)	403 New	Operating System	**CO1**	Students will be able to know the services provided by Operating System
			CO2	Students will be able to know the scheduling concept
			CO3	Students will be able to understand design issues related to memory management and various related algorithms.
			CO4	Students will be able to understand design issues related to File management and various related algorithms
S.Y.B.B.A (C.A.)	404	Enterprise Resource Planning and Management	**CO1**	Students will be able to understand ERP and learned about different technologies used.
S.Y.B.B.A (C.A.)	404 New	Advance PHP	**CO1**	Students will be able to know & understand concepts of internet programming.

	(Option)		**CO2**	Students will be able to understand how server-side programming works on the web.
			CO3	Students will be able to understanding How to use PHP Framework (Joomla / Druple)
S.Y.B.B.A (C.A.)	404 New (Option)	Node – JS	**CO1**	Students will be able to understand the JavaScript and technical concepts behind Node JS.
			CO2	Students will be able to structure a Node application in modules.
			CO3	Students will be able to understand and use the Event Emitter.
			CO4	Students will be able to understand Buffers, Streams, and Pipes.
			CO5	Students will be able to build a Web Server in Node and understand how it really works.
			CO6	Students will be able to connect to a SQL or Mongo database in Node.
S.Y.B.B.A (C.A.)	406	Computer Laboratory and Practical Work (VB + C++)	**CO1**	Student will be able to solve the practical problem using Object Oriented Programming Using C++ and Visual Basic
			CO2	Student will be able to construct the programs using bottom-up design approach
			CO3	Students will be able to debug analyze run-time execution of VB and C++ application
			CO4	Students will be able to implement class, function overloading, operating overloading, Polymorphism, templates, etc.
			CO5	Students will be able to use ActiveX controls to improve design and effectiveness of VB application.
			CO6	Students will be able to prepare report in Visual Basic
S.Y.B.B.A (C.A.)	AddOn	JQuery	**CO1**	Students will be able to understand the JavaScript language & the Document Object Model.
			CO2	Students will be able to detect and respond to user actions.
			CO3	Students will be able to Alter, show, hide and move objects on a web page.
SEMESTER V				
T.Y.B.B.A (C.A.)	501	Java Programming	**CO1**	Students will be able to understand programming language concepts, particularly Java and object-oriented concepts.
			CO2	Students will be able to write, debug, and document well-structured Java applications.
			CO3	Students will be able to implement Java classes from specifications and effectively create and use objects from predefined class

				libraries.
			CO4	Students will be able to understand the behavior of primitive data types, object references, and arrays.
			CO5	Students will be able to apply decision and iteration control structures to implement algorithms
T.Y.B.B.A (C.A.)	502	Web Technologies	**CO1**	Students will be able to write a well formed / valid XML document.
			CO2	Students will be able to write a server side java application called Servlet to catch update and delete operations on DBMS table.
			CO3	Students will be able to write a server side java application called Servlet to catch form data sent from client, process it and store it on database.
			CO4	Students will be able to write a server side java application called JSP to catch form data sent from client and store it on database.
T.Y.B.B.A (C.A.)	503	Dot Net Programming	**CO1**	Students will be able to use features of Dot Net Framework along with Visual Basic.
			CO2	Students will be able to develop Graphical User Interface based on problem specified.
			CO3	Students will be able to develop and debug application very easily.
T.Y.B.B.A (C.A.)	504	Object Oriented Software Engineering	**CO1**	Students will be able to describe the three pillars of object-orientation methodologies and explain the benefits of each.
			CO2	Students will be able to create use case documents that capture requirements for a software system.
			CO3	Students will be able to create class diagrams that model both the domain model and design model of a software system.
			CO4	Students will be able to design the interface between the classes and objects.
			CO5	Students will be able to create an interaction diagrams that models the dynamic aspects of a software system.
			CO6	Students will be able to understand the facets of the Unified Process approach to designing and building a software system.
			CO7	Students will be able to describe how design patterns facilitate development and list several of the most popular patterns.
			CO8	Students will be able to design the Axioms and corollaries.

			CO9	Students will be able to build a model for the user interface (UI) of a software application
			CO10	Students will be able to measure the Level of User satisfaction and software quality assurance.
T.Y.B.B.A (C.A.)	505	Project work (Based on C++ & VB)	**CO1**	Student is able to prepare software requirements.
			CO2	Students can understand the user/client requirements.
			CO3	Students can design the software using various tools and functions.
			CO4	Students can able to design the framework of the particular topic.
			CO5	Students can prepare different types of reports of the project.
			CO6	Students can prepare the documentation of the entire project.
T.Y.B.B.A (C.A.)	506	Lab Course (Java & Web tech)	**CO1**	Students will be able to setup up and use a webserver for testing and deploying web applications.
			CO2	Students will be able to learn to create simple static webpages using html tags.
			CO3	Students will be able to learn client side scripting using a scripting language.
			CO4	Students will be able to use DOM concepts for client side scripting.
			CO5	Students will be able to learn server side scripting using database connectivity and report generation.
			CO6	Students will be able to learn the concept of Java application
			CO7	Students will be able to use different swing concepts.
			CO8	Students will be able to learn how to connect front end with backend.
SEMESTER VI				
T.Y.B.B.A (C.A.)	601	Advanced Web Technologies	**CO1**	Students will be able to understand the Mark-up language technology such as XML Structure and tools.
			CO2	Students will be able to understand advanced web technologies such as AJAX.
			CO3	Students will be able to understand advanced web topic such as Web Services.
			CO4	Students will be able to develop a dynamic webpage by using JavaScript and HTML.
			CO5	Students will be able to write a valid XML document

T.Y.B.B.A (C.A.)	602	Advanced Java	**CO1**	The students will have the competence in the use of Java Programming language.
			CO2	The students will be able to develop small to medium sized application programs that demonstrate professionally acceptable coding.
T.Y.B.B.A (C.A.)	603	Recent Trends in IT	**CO1**	Students will be able to analyze the problems.
			CO2	Students will be able to learn how to analyze and create systems to accomplish tasks.
			CO3	Students will be able to evaluate rapidly evolving trends and to integrate knowledge from appropriate fields to make effective and ethical technology decisions.
T.Y.B.B.A (C.A.)	604	Software Testing	**CO1**	Students will understand various test processes and continuous quality improvement.
			CO2	Students will learn types of errors and fault models.
			CO3	Students will understand the methods of test generation from requirements.
			CO4	Students will understand Test adequacy assessment using: control flow, data flow, and program mutations.
			CO5	Students will be able to use of various test tools.
			CO6	Students will be able to use application of software testing techniques in commercial environments.
T.Y.B.B.A (C.A.)	605	Project work (Based on Java & .Net)	**CO1**	Student is able to prepare software requirements.
			CO2	Students can understand the user/client requirements.
			CO3	Students can design the software using various tools and functions.
			CO4	Students can able to design the framework of the particular topic.
			CO5	Students can prepare different types of reports of the project.
			CO6	Students can prepare the documentation of the entire project.
T.Y.B.B.A (C.A.)	606	Lab Course (Advance Java & Advance Web tech)	**CO1**	Students will be able to study the different Java components.
			CO2	Students will be able to learn the different forms of java and php as applicable for effective presentation.
			CO3	Students will be able to study the major components of java and php their integrated

				effect.
			CO4	Students will be able to study the different formats and application packages to create and edit.
			CO5	Students will be able to learn the techniques of database connectivity using different software applications.
			CO6	Students will be able to learn the techniques of video capturing and conversion using different software applications

Name of the Programme: B.Sc. Botany

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
F.Y. B.Sc.	BO - 111	Plant Life and Utilization - I	**CO1**	The students will develop understanding about the diversity, identification and classification of lower plants.
			CO2	The students will learn about structure, growth and propagation of a representative from each group, thus giving them a detailed understanding of each plant group.
			CO3	Economic importance of algae, fungi, bryophytes and lichens with their significance in ecological studies will also be understood by students.
F.Y. B.Sc.	BO - 112	Plant Morphology and Anatomy	**CO1**	Students will learn terms used in describing the morphology of flowering plants and anatomy in detail.
			CO2	They will become well versed with the structure and functions of various organs of flowering plants.
			CO3	Students will also get an insight into applications of morphology and anatomy in classification & phylogeny.
F.Y. B.Sc.	BO - 113	Practicals Based On BO 111 & BO 112	**CO1**	Students will be able to identify live specimens of crytpogams & phanerogams, apply terminology in their study.
			CO2	Students will be able to categorize plants into Monocot and Dicot on the basis of anatomical characters; identify type and development of fruits
			CO3	Through field trips, students will observe biodiversity, adaptations in plants according to their habitat and ecological significance of each plant group.
SEMESTER II				
F.Y. B.Sc.	BO - 121	Plant Life and Utilization II	**CO1**	The students will also get an insight into applications of morphology and anatomy in classification & phylogeny.
			CO2	Students will learn about the structure: morphology & anatomy, and propagation of a representative from each group, thus giving a detailed understanding of higher plants.

			CO3	Students will become aware of the importance of phanerogams in ecological studies and their services to mankind.
F.Y. B.Sc.	BO - 122	Principles of Plant Science	**CO1**	Students will be able to understand the various physiological life processes in plants and their importance.
			CO2	Students will be able to learn different types of cell divisions, their stages and importance.
			CO3	Students will focus on the central dogma of molecular biology by studying the structures of DNA & RNA with special reference to their regulatory role.
			CO4	Students will understand the principle mechanisms of DNA replication.
F.Y. B.Sc.	BO - 123	Practicals Based On BO 121 & BO 122	**CO1**	Students will be able to apply theoretical knowledge in studying live specimens in the laboratory and their industrial applications in human welfare.
			CO2	Students will gain expertise in preparing slides for cytological studies.
			CO3	Students will gain hands on experience in handling equipment for physiological experiments like plasmolysis, DPD and chlorophyll estimation.
SEMESTER III				
S.Y. B.Sc.	BO-231	Taxonomy of Angiosperms & Plant Ecology	**CO1**	Students will learn about the objectives and importance of taxonomy, exploration, identification, nomenclature and classification of plants using different systems as well as families as examples.
			CO2	The students will be introduced to ecology, its concept, scope, and interdisciplinary approach; concept and basis of 'hotspot' identification and ecological grouping of the plants
			CO3	Students will get well versed with methods of vegetation sampling, types of diversity & the application of all these concepts in case study.
S.Y. B.Sc.	BO-232	Plant Physiology	**CO1**	Students will be able to understand the various physiological life processes in plants and factors affecting these processes.
			CO2	During the course, students will gain knowledge about nitrogen fixation, seed dormancy and their applications in agriculture.
			CO3	Students will understand the role of various phytohormones & their applications in agriculture, horticulture, etc.
S.Y. B.Sc.	BO 233	Practical based on	**CO1**	Students will gain expertise in identifying and

		BO 231 & BO 232		classifying angiospermic plants; identify plants based on ecological adaptations due to particular habitat.
			CO2	Students will be able to calculate seed germination percent, vigour, estimate proteins and starch in germinating/non germinating seeds, the steps in seed industry
			CO3	Experiments in physiology such as transpiration, DPD, etc. will give students a better understanding of their role in plant growth and development.
			CO4	Visit to seed testing centre and horticulture unit will give students a better understanding of functioning of the industries and also inculcate self employability.
SEMESTER IV				
S.Y. B.Sc.	BO-241	Plant Anatomy & Embryology	**CO1**	Students get an understanding of the scope of anatomy by studying different forms of mechanical tissues, epidermis, secondary growth: normal & anomalous.
			CO2	Students learn the entire process of development of male & female gametophytes, subsequent gametes, fertilization followed by embryogeny.
S.Y. B.Sc.	BO-242	Plant Biotechnology	**CO1**	Students will understand the basic properties of plant cell, tissue culture technique, and application of this knowledge in various fields for conservation and bioremediation.
			CO2	Students get well versed with concepts and applications of Genomics, Proteomics and Bioinformatics.
S.Y. B.Sc.	BO 243	Practical based on BO 241 & BO 242	**CO1**	Students will be able to understand the structure, distribution and importance of epidermal and mechanical tissues in the life of a plant and ecological importance of the same.
			CO2	Study of slides will give a detailed understanding of embryogenesis in students.
			CO3	Students will learn handling and care of laboratory equipment used in a tissue culture laboratory, sterilization methods and inoculation.
			CO4	Students will gain expertise in cultivation of economically importance alga *Spirulina*
			CO5	Visit to tissue culture laboratory will motivate students towards research.
SEMESTER V				
T.Y. B.Sc.	BO-351	Algae and Fungi	**CO1**	Students will learn about lower cryptogams in

				detail: classification, thallus organization and distribution.
			CO2	Students will be able to identify different examples of lower cryptogams by studying their life cycles in detail.
			CO3	Students will learn about the economic and ecological importance of lower cryptogams.
T.Y. B.Sc.	BO-352	Archegoniate	**CO1**	Students will be able to differentiate between different lower and higher cryptogams.
			CO2	Students will understand the evolutionary process of lower plant groups.
			CO3	Different types of life cycle with type study will be learnt by students.
T.Y.B.Sc.	BO-353	Spermatophyta and Paleobotany	**CO1**	Origin of angiospermic plants and the various systems of classification will be understood by students.
			CO2	Students will learn characters & economic importance of families, thus, they will be able to identify plants on field & also learn techniques of preservation.
			CO4	Students will gain knowledge about classification, distribution, characters & life cycle of gymnosperms.
			CO5	Formation process and different types of fossils will be understood by students.
T.Y. B.Sc.	BO-354	Plant Ecology	**CO1**	Students will get well versed with interrelationships between the living world and the environment, homeostasis and plant indicators.
			CO2	Concepts of population & community ecology will be understood.
			CO3	Students will be able to understand better the biogeochemical cycles, their types & significance in an ecosystem.
			CO4	Students will be introduced to a new concept: EIA, environmental audit and significance of each in sustainable development.
T.Y. B.Sc.	BO-355	Cell and Molecular Biology	**CO1**	Students will get an insight into structure & functions of basic unit of life i.e. cell and various organelles.
			CO2	Students will learn about genetic material DNA its structure, function and the process of replication.
			CO3	Students understanding on gene expression & regulation will be enhanced.
T.Y. B.Sc.	BO-356	Genetics	**CO1**	Different laws of Genetics will be correctly understood by students alongwith transfer of

				characters from parents to offspring, interaction of genes & structure of chromosome.
			CO2	Students will be introduced to concepts such as mutations and sex linked inheritance.
T.Y. B.Sc.	BO-3510	Medicinal Botany	**CO1**	Skill enhancement course will introduce students to different indigenous systems of medicine.
			CO2	Students will learn new skills to conserve and propagate medicinal plants used in traditional medicine.
			CO3	Students will get an insight about ethnobotany and folk medicine.
T.Y. B.Sc.	BO-3511	Plant Diversity and Human Health	**CO1**	Students get a chance to learn the concept of plant diversity & agrodiversity
			CO2	Students become aware of factors leading to loss of agrobiodiversity, and projected scenario for biodiversity loss.
			CO3	Detailed information on Conservation of Biodiversity, social approaches to conservation, biodiversity awareness programmes and sustainable development will be understood by students to get a better understanding of role of plants in human life.
			CO4	With new skills, social ethics and environmental sustainability are also inculcated in students.
T.Y. B.Sc.	BO 357	Practical based on BO 351 and BO 352	**CO1**	Students will be able to identify cryptogams and classify them based on morphology & reproductive structures.
			CO2	Techniques in anatomy will be enhanced in students.
			CO3	Evolutionary trends related to stelar evolution in pteridophytes will be understood better.
T.Y. B.Sc.	BO 358	Practical based on BO 353 and BO 354	**CO1**	Students will be able to describe diagnostic features of phanerogams and classify plants based on family characters.
			CO2	Identification of fossils, ecological studies using remote sensing will becomes easier for students.
			CO3	Students will be able to apply data to study ecosystem types.
T.Y. B.Sc.	BO 359	Practical based on	**CO1**	Students will be able to identify and observe

		BO 355 and BO 356		the structural changes in a cell during cell divisions: mitosis & meiosis and colchicine treatment
			CO2	Students will gain expertise in techniques of DNA & RNA isolation & estimation
			CO3	Study of chromosomes, tetraploidy, structural heterozygotes will be better understood by students.
			CO4	Students will be able to apply and solve problems on genetics related to PTC sensitivity, multiple alleles, three point test cross, etc.
SEMESTER VI				
T.Y. B.Sc.	BO-361	Plant Physiology & Metabolism	**CO1**	Different mineral elements utilized by plants for their growth and the amount in which they are utilized will be understood by students.
			CO2	Students will learn about different metabolic cycles used by plants in different conditions and their significance.
			CO3	Students will learn about the process of translocation of food within the plant body.
			CO4	Types of plant growth regulators, their role and the concept of photomorphogenesis will be understood by students.
T.Y. B.Sc.	BO-362	Biochemistry	**CO1**	Students will learn about the structure, function and commercial significance of different biomolecules.
			CO2	Students will learn about the mechanism of action of enzymes.
			CO3	Students will be able to correctly identify the different metabolic pathways of different biomolecules.
T.Y. B.Sc.	BO-363	Plant Pathology	**CO1**	Students will learn different terminologies used in the study of plant diseases.
			CO2	Students will understand about defence mechanism in plants and methods of studying plant diseases.
			CO3	Students will develop an understanding of the importance of pathological studies in relation to crop plant diseases.
			CO4	Students will learn about the processes of controlling various plant diseases.
T.Y. B.Sc.	BO-364	Evolution and Population genetics-	**CO1**	Students will understand about the origin of earth and life on earth.
			CO2	Different theories of evolution will be learnt

				by students.
			CO3	Students will get an insight about geological time scale and fossils.
			CO4	Students will learn about genetic frequency and genetic polymorphism within a population and species isolation.
T.Y. B.Sc.	BO-365	Advanced Plant Biotechnology	**CO1**	Students will understand the concept of tissue culture in detail from the time of its discovery and landmarks.
			CO2	Students will get to know about different techniques in genetic engineering used to prepare genetically modified plants, thus enhancing crop production.
			CO3	Students will understand the role of microorganisms in the synthesis of different commercial products.
			CO4	Students will learn about the application of nanotechnology in agriculture.
T.Y. B.Sc.	BO-366	Plant Breeding and Seed Technology	**CO1**	Students will be introduced to a field of agriculture called plant breeding, the concept, its history and scope.
			CO2	Students will learn traditional and advanced methods of plant breeding to enhance crop production.
			CO3	The set up of a seed industry - its working; seed production - its stages will be understood by students to develop employability skills in them.
T.Y. B.Sc.	BO-3610	Nursery and Gardening Management	**CO1**	Skill enhancement in nursery & gardening management will be inculcated in students.
			CO2	Propagation of plants and gardening operations will be learnt & understood by students in detail.
T.Y. B.Sc.	BO-3611	Biofertilizers	**CO1**	Students will get an opportunity to learn about biofertilizers, their types & importance in agriculture.
			CO2	Students will be able to learn the methods of cultivation of various biofertilizers, including manures, thus enhancing their skills.
T.Y. B.Sc.	BO 367	Practical based on BO 361 and BO 362	**CO1**	Students will be able to practically observe plasmolysis, determine stomatal frequency & stomatal index of leaves and their importance to plant physiology.
			CO2	Physiological processes, enzymology, estimation of proteins, vitamins, other biomolecules, spectrophotometry will be

				understood & applied by students in research, in the near future.
			CO3	Students will be able to use chromatography techniques for various isolations & estimations.
T.Y. B.Sc.	BO 368	Practical based on BO 363 and BO 364	**CO1**	Students will learn laboratory techniques such as preparation of media, sterilization techniques and inoculation.
			CO2	Students will be able to identify plant diseases, causal organisms, method of infection and control of diseases
			CO3	Fossil identification through specimen study and visit to museum will be clearly understood by students.
			CO4	Students will be able to solve problems based on allele and gene frequency; study sympatric and allopatric speciation.
T.Y. B.Sc.	BO 369	Practical based on BO 365 and BO 366	**CO1**	Students will gain expertise in handling equipment used in genetic engineering like gene gun, PCR, gel doc, microcentrifuge, electrophoresis, micropipettes, incubator, shaker, etc.; preparation of media and other techniques in plant tissue culture.
			CO2	Students will be able to understand genetic engineering and mutagenesis - their applications in agriculture, eg. transgenic plants.
			CO3	Students will be able to evaluate plant breeding methods for betterment of mankind and crop improvement, interpret application of conventional and non-conventional methods of plant breeding and learn methods of seed testing.

Name of the Programme: B.Sc. Chemistry

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
F.Y.B.Sc.	CH-101	Physical Chemistry	**CO1**	Students will be able to apply thermodynamic principles to physical and chemical process
			CO2	To calculate of enthalpy , Bond energy, Bond dissociation energy , resonance energy
			CO3	To understand the relation between Free energy and equilibrium and factors affecting on equilibrium constant.
			CO4	To understand the concept to ionization process occurred in acids, bases and pH scale
			CO5	Gas equilibrium, equilibrium constant and molecular interpretation of equilibrium constant
F.Y.B.Sc.	CH-102	Organic Chemistry	**CO1**	The students will understand the fundamentals, principles, and recent developments in the subject area.
			CO2	It will inspire and boost interest of the students towards chemistry as the main subject..
			CO3	The Learner will familiarize with current and recent developments in Chemistry.
			CO4	It will create foundation for research and development in Chemistry.
F.Y.B.Sc.	CH-103	Chemistry Practical Course I	**CO1**	The students will understand the importance of chemical safety and Lab safety while performing experiments in laboratory
			CO2	The students will understand to determine thermochemical parameters and related concepts
			CO3	The students will understand techniques of pH measurements and preparation of buffer solutions
			CO4	The students will learn elemental analysis of organic compounds and chromatographic techniques

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER II				
F.Y.B.Sc.	CH-201	Inorganic Chemistry	**CO1**	Students will be able to understand origin of quantum mechanics and its need to understand structure of hydrogen atom
			CO2	To understand the Schrodinger equation for hydrogen atom.
			CO3	Explain rules for filling electrons in various orbitals- Aufbau's principle, Pauli exclusion principle, Hund's rule of maximum multiplicity
			CO4	To describe Block, group, modern periodic law and periodicity.
			CO5	Explain periodicity in the following properties in details: a. Effective nuclear charge, shielding or screening effect; some numerical problems.
			CO6	Define various types of chemical bonds- Ionic, covalent, coordinate and metallic bond
			CO7	Explain characteristics of ionic bond, types of ions, energy consideration in ionic bonding, lattice and solvation energy
F.Y.B.Sc.	CH-202	Analytical Chemistry	**CO1**	The students will understand the calculations of mole, molar concentrations and various units of concentrations which will be helpful for preparation of solution.
			CO2	The students will understand SI units, distinction between mass and weight
			CO3	Basics of type determination, characteristic tests and classifications, reactions of different functional groups. Separation of binary mixtures and analysis
			CO4	Elemental analysis -Detection of nitrogen, sulfur, halogen and phosphorous by Lassaigne test.
			CO5	Basics of chromatography and types of chromatography
			CO6	Understand pH meter and electrodes for pH measurement
F.Y.B.Sc.	CH-203	Chemistry Practical Course II	**CO1**	The students will understand inorganic estimations using volumetric analysis
			CO2	The students will understand Purification of organic compounds
			CO3	The students will understand Synthesis of Inorganic compounds

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER III				
S.Y.B.Sc.	CH-301	Physical and Analytical Chemistry	**CO1**	Students will be able to explain concept of kinetics, terms used, rate laws, molecularity, order.
			CO2	To derive integrated rate laws, characteristics, expression for half-life and examples of zero order, first order, and second order reactions.
			CO3	Derivation of Arrhenius equation and evaluation of energy of activation
			CO4	To describe Block, group, modern periodic law and periodicity.
			CO5	Explain adsorption, classification of given processes into physical and chemical adsorption.
			CO6	Discuss factors influencing adsorption, its characteristics, differentiates types as physisorption and Chemisorption
			CO7	Define, explain and compare meaning of accuracy and precision and apply the methods of expressing the errors in analysis from results.
S.Y.B.Sc.	CH-302	Inorganic and Organic Chemistry	**CO1**	The students will understand terms related to molecular orbital theory and explain formation of different types of MO's from AO's.
			CO2	The students will draw and explain MO energy level diagrams for homo and hetero diatomic molecules.
			CO3	Define different terms related to the coordination chemistry
			CO4	Explain Werner's theory of coordination compounds.
			CO5	Identify and draw the structures aromatic hydrocarbons from their names or from structure name can be assigned.
			CO6	Identify and draw the structures alkyl / aryl halides from their names or from structure name can be assigned.
S.Y.B.Sc.	CH- 203	Practical Chemistry III	**CO1**	The students will understand the kinetics of reactions
			CO2	The students will understand qualitative estimation of organic compounds
			CO3	The students will understand synthesis of Inorganic compounds

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER IV				
S.Y.B.Sc.	CH-401	Physical and Analytical Chemistry	**CO1**	Students will be able to define the terms in phase equilibria such as- system, phase in system, components in system, degree of freedom
			CO2	To derive of phase rule and explain of one component system-water & sulphur
			CO3	Define various terms, laws, differentiate ideal and no-ideal solutions.
			CO4	Interpretation of i) vapour pressure–composition diagram ii) temperature- composition diagram.
			CO5	Define different terms in conductometry such as electrolytic conductance, resistance, conductance
			CO6	Apply conductometric methods of analysis to real problem in analytical laboratory.
			CO7	Explain and derive Beer's law of absorptivity.
			CO8	Explain different terms in column chromatography such as stationary phase, mobile phase, elution, adsorption, ion exchange resin, adsorbate
S.Y.B.Sc.	CH-402	Inorganic and Organic Chemistry	**CO1**	The students will understand isomerism in coordination complexes.
			CO2	Apply principles of VBT to explain bonding in coordination compound of different geometries.
			CO3	Identify & explain discuss inner and outer orbital complexes.
			CO4	Apply crystal field theory to different type of complexes (Td, Oh, sq. pl complexes)
			CO5	Explain and discuss synthesis of aldehydes and ketones.
			CO6	Write and discuss the mechanism reactions carboxylic amines.
			CO7	Draw the structures of different conformations of cyclohexane
S.Y.B.Sc.	CH- 403	Practical Chemistry IV	**CO1**	The students will understand cell constant and application of conductometric techniques.
			CO2	The students will be able to separate mixtures using column chromatography.
			CO3	The students will be able to verify the Freundlich and Langmuir adsorption isotherm
			CO4	Verify Beer-Lambert's law
			CO5	Students will learn organic estimations.

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER V				
T.Y.B.Sc.	CH-501	Physical Chemistry-I	**CO1**	Students will be able to students will be able to know historical of development of quantum mechanics in chemistry & understand the idea of wave function
			CO2	Understand the meaning of electrical polarization of molecule, induced and orientation polarization
			CO3	Electromagnetic spectrum, Nature of wave and its characteristics
			CO4	Raman spectra: Concept of polarizability, Pure rotational Raman spectra of diatomic molecules
			CO5	Difference between thermal and photochemical processes. Quantum yield and reasons for high and low quantum yield.
			CO6	Discuss factors influencing factors affecting the quantum yield
T.Y.B.Sc.	CH-502	Analytical Chemistry-I	**CO1**	The students will be able to define basic terms in gravimetry, spectrophotometry, qualitative analysis and parameters in instrumental analysis.
			CO2	The students will identify important parameters in analytical processes or estimations.
			CO3	Explain different principles involved in the gravimetry, spectrophotometry, parameters in instrumental analysis, qualitative analysis.
			CO4	Describe procedure for different types analyses included in the syllabus.
			CO5	Design analytical procedure for given sample and apply whatever theoretical principles he has studied in theory
T.Y.B.Sc.	CH- 503	Physical Chemistry Practical I	**CO1**	The students will understand the concept and applications of specific refractivity, molar refractivity and techniques involved.
			CO2	The students will be able to work with spectrophotometer with a proper understanding of Beer-lambert;s law.
			CO3	The students will understand the concept of cell constant, Kohlrausch law and its applications.
			CO3	The students will be able to perform viscosity experiments using Ostwald's viscometer.
T.Y.B.Sc.	CH-504	Inorganic Chemistry - I	**CO1**	Students will be able to understand about inert and labile complexes and stability of complexes in aqueous solutions
			CO2	Classification of reactions of coordination compounds

			CO3	To know the general electronic configuration & electronic configuration of elements.
			CO4	To know trends in periodic properties of these elements with respect to various properties
			CO5	Write electronic configuration of lanthanides and actinides.
			CO6	Lanthanide contraction and effects of lanthanide contraction on post-lanthanides.
T.Y.B.Sc.	CH- 505	Industrial Chemistry	**CO1**	The students are expected to learn importance of chemical industry
			CO2	The students are expected to learn concept of basic chemicals, their uses and manufacturing process
			CO3	The students are expected to learn importance of sugar industry, manufacture of direct consumption sugar
			CO4	The students are expected to learn different types of soap products, chemistry of soap.
			CO5	Students should know about dyes, intermediates, structural features of a dye and classification of dyes.
T.Y.B.Sc.	CH- 506	Inorganic Chemistry Practical I	**CO1**	The students will understand gravimetric estimation of various metals.
			CO2	The students will be able to analyze sodium bicarbonate from mixture by thermal decomposition method
			CO3	The students will learn preparation of inorganic complexes and spot tests for metal ions and ligands
			CO4	Inorganic Qualitative analysis of simple water soluble mixture, mixtures containing borates and phosphates
			CO5	Qualitative and confirmatory tests of inorganic toxicants of any four ions.
T.Y.B.Sc.	CH-507	Organic Chemistry - I	**CO1**	Students will be able to define and classify polynuclear and hetreonuclear aromatic hydrocarbons.
			CO2	Write the structure, synthesis of polynuclear and hetreonuclear aromatic hydrocarbons.
			CO3	Explain the reactivity of polynuclear and hetreonuclear aromatic hydrocarbons.
			CO4	To predict product with panning or supply the reagent/s for these reactions.
			CO5	To write the mechanism of some named rearrangement reactions and their applications
			CO6	Understand E1, E2 and E1cB mechanism

			CO7	Effect of factors on the rate elimination reactions.
T.Y.B.Sc.	CH- 508	Chemistry of Biomolecules	**CO1**	The student will understanding of Cell types, Difference between a bacterial cell, Plant cell and animal cell.
			CO2	Biological composition and organization of cell membrane, structure and function of various cell organelles of plant and animal cell.
			CO3	The student will understand the types of carbohydrates and their biochemical significance in living organisms, structure of carbohydrates and reactions of carbohydrates
			CO4	The student needs to know the types of lipids with examples, structure of lipids, properties of lipids
			CO5	The student will understand the structure and types of amino acids. Reactions of amino acids. Properties of amino acids.
			CO6	The student know the classes of enzymes with subclasses and examples. Enzyme specificity, Equations of enzyme kinetics Km and its significance.
			CO7	Basic concepts of Endocrinology. Types of Endocrine glands and their hormones.
T.Y.B.Sc.	CH- 509	Organic Chemistry Practical I	**CO1**	The students will be able to separate Binary Mixtures and perform qualitative analysis
			CO2	The students will understand the concept of green chemistry, its importance and some synthesis using green chemistry technique.
			CO3	The students will be able to perform synthesis of organic compounds and their organic derivatives
			CO4	The students will be able to systematic working skill in laboratory will be imparted in student.
T.Y.B.Sc.	CH-510	Polymer Chemistry	**CO1**	The students are expected to learn the history of polymers and difference between simple compounds and polymer.
			CO2	The students are expected to know difference between natural, synthetic, organic and inorganic polymers.
			CO3	The students are expected to understand the mechanisms of polymerization.
			CO4	The students are expected to understand the polymerization techniques.
			CO5	The students are expected to understand uses & properties of polymers.
			CO6	The students are expected to understand role of polymer industry in the economy.
			CO7	The students are expected to understand the

				advantages of polymers
T.Y.B.Sc.	CH- 511	Environmental Chemistry	**CO1**	Students should know the importance and conservation of environment and importance of biogeochemical cycles
			CO2	Students should know water resources, hydrological cycle, organic and inorganic pollutants, water quality parameters
			CO3	Students should know water quality parameters and standards.
			CO4	Students should know analytical techniques in water analysis
			CO5	Students should know water pollutants, eutrophication, waste water treatment

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER VI				
T.Y.B.Sc.	CH-601	Physical Chemistry-II	**CO1**	The student will be able to know and understand electrochemical cells: Explanation of Daniell cell
			CO2	Understand the EMF of electrochemical cell and its measurement.
			CO3	The primary reference electrode: The standard hydrogen electrode with reference to diagram, Construction, representation
			CO4	Secondary reference electrodes, calomel electrode, glass electrode, silver-silver chloride electrode
			CO5	Nernst Equation for theoretical determination of EMF
			CO6	Applications of emf measurements: Determination of pH of a solution by using hydrogen electrode, quinhydrone electrode and glass electrodes Potentiometric titrations
			CO7	Detection and Measurement of Radioactivity
T.Y.B.Sc.	CH-602	Physical Chemistry-III	**CO1**	The students will be able to perform potentiometric titration.
			CO2	The students will know application of colligative properties to determine molecular weight of nonelectrolyte, abnormal molecular weight.
			CO3	Factors affecting on solid state reactions.
			CO4	Applying rate laws for solid state reactions
T.Y.B.Sc.	CH- 603	Physical Chemistry Practical II	**CO1**	The students will understand the concept and applications of specific refractivity, molar refractivity and techniques involved.
			CO2	The students will be able to determine of Pka of given weak acid by pH metry titration with strong base
			CO3	The students will able to determine the molecular weight of solute by depression in freezing point method.
			CO3	The students will be able to perform analyse crystal structure from X-ray diffraction spectra
T.Y.B.Sc.	CH-604	Inorganic Chemistry - II	**CO1**	Students will be able to understand the multiple bonding due to CO ligand.
			CO2	To understand the uses of organometallic compounds in the homogenous catalysis.
			CO3	Understand the phenomenon of catalysis, its basic principles and terminologies.
			CO4	Understand the classification and essential properties of heterogeneous catalysts.

			CO5	Know the abundance of elements in living system and earth crust and give the classification of metals as enzymatic and non-enzymatic.
T.Y.B.Sc.	CH- 605	Inorganic Chemistry - III	**CO1**	The Student will learn the concept of acid base and their theories.
			CO2	The students are to draw the simple cubic, BCC and FCC structures.
			CO3	The students are expected to learn different Zeolite Framework Types and their classification
			CO4	A student should know various methods of nanoparticle synthesis
			CO5	A student should know toxic chemical in the environment and know the impact of toxic chemicals on enzyme.
T.Y.B.Sc.	CH- 606	Inorganic Chemistry Practical II	**CO1**	The students will know volumetric estimation and analysis of Phosphate from Fertilizer..
			CO2	The students will be able to analyze metals by Flame Photometry
			CO3	The students will learn the column chromatography technique
			CO4	The student will have the experience of synthesis of nanoparticles
T.Y.B.Sc.	CH-607	Organic Chemistry - II	**CO1**	Students will learn the interaction of radiations with matter and understand different regions of electromagnetic radiations.
			CO2	Students will understand the principle of UV spectroscopy and the nature of UV spectrum.
			CO3	Students will be able to calculate maximum wavelength for any conjugated system.
			CO4	From the IR spectrum, they will be able to find out IR frequencies of different functional groups.
			CO5	Students will understand the principle of NMR spectroscopy and will understand various terms used in NMR spectroscopy.
			CO6	Students will learn the principle of mass spectroscopy, its instrumentation and nature of mass spectrum.
T.Y.B.Sc.	CH- 608	Organic Chemistry - III	**CO1**	The student will understanding the concept of Retrosynthetic Analysis and its Applications
			CO2	Organic Reaction Mechanism and Synthetic Applications and the common name reactions
			CO3	The student will understand the role of Reagents in Organic Synthesis
			CO4	The student needs to know the natural products like Terpenoids and alkaloids

T.Y.B.Sc.	CH- 609	Organic Chemistry Practical II	**CO1**	The students will be able to explain "fingerprint region" of an infrared spectrum can used in the identification of an unknown compound.
			CO2	The students will be able to identify the functional group or groups present in a compound.
			CO3	The students will be able to understand use NMR spectra to determine the structures of compounds.
			CO4	The students will be able to practical knowledge of handling chemicals..
T.Y.B.Sc.	CH-610	Chemistry of Soil and Agrochemicals	**CO1**	The students know the different components and properties of soil.
			CO2	The students are expected to explore the problems and potentials of soil and decide the most appropriate treatment for land use.
			CO3	The students are expected to make decisions on nutrient dose, choice of fertilizers and method of application etc. practiced in crop production.
			CO4	Proper understanding of chemistry of pesticides will be inculcated among the students.
			CO5	Imparts knowledge on different pesticides, their nature and, mode of action and their fate in soil so as to monitor their effect on the environment.
T.Y.B.Sc.	CH- 611	Analytical Chemistry II	**CO1**	Students should define basic terms in solvent extraction, basics of chromatography, HPLC, GC, and AAS and AES
			CO2	Students should able to identify important parameters in analytical processes or estimations.
			CO3	Explain different principles involved in the analyses using solvent extraction, basics of instrumental chromatography, HPLC, GC, and atomic spectroscopic techniques.
			CO4	Describe procedure for different types analyses included in the syllabus.
			CO5	Design analytical procedure for given sample.

Name of the Programme: M.Sc. Chemistry

POSTGRADUATE PROGRAMME: PROGRAM OUTCOMES (POs) :

After successfully completing the M. Sc. Organic Chemistry program students will be able to

1. Learn the terms, theories, assumptions, methods, principles, theorem statements and classification.
2. Fix out the problem and resolve it using theories and practical knowledge.
3. Inculcate knowledge for carrying projects and advanced research related skills.
4. Actively participate in team on case studies and field-based situations.
5. Analyze and interpret ideas, evidences and experiences with learned scientific reasoning.
6. Aware and implement the subject facts that can be applied for the personal and social development.
7. Use digital literacy to retrieve and evaluate subject related information.
8. Get moral and ethical values for society as well as in research.
9. Give analytical reasoning to interpret research data.
10. Improve their managerial skills and abilities in subject related activities.
11. Inculcate continuous learning habit through all available resources.
12. To define a problem, analyse, interpret and draw conclusion by planning, implementing and reporting the results of an experiment.

POSTGRADUATE PROGRAMME: COURSE OUTCOMES (COs) :

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
M.Sc. I	CHE-501	Physical Chemistry-I	CO1	Students should be able to remember the concepts of thermodynamic parameters, quantum mechanical postulates, rate laws of chemical reactions and computation of macroscopic properties of matter.
			CO2	Students should understand the basics like state function and path function, Schrodinger wave equation, kinetics of fast reactions, partition functions and ensembles.
			CO3	Students should be able to apply the knowledge of various quantum mechanical methods to determine the different molecular properties and built the concept of the relation between thermodynamics and quantum mechanics.
			CO4	Students should be able to analyze the rates of various chemical reactions both theoretically and experimentally and also observe the effect of catalyst and determine energies of activation of such reactions.
			CO5	Students should be able to evaluate variation of thermodynamic parameters for multi component systems and their variation with other extensive properties, Schrodinger wave equation and its application to hydrogen and hydrogen like atoms.
			CO6	Students should be able to create the solutions to avoid excess use of energy in chemical reactions by applying their knowledge of thermodynamics and chemical kinetics.
M.Sc. I	CHEO D-502	Inorganic Chemistry-I	CO1	Define symmetry elements and symmetry operations, classes, properties of a group, group multiplication table, etc.
			CO2	Classify symmetry elements, point group, Group, sub-group and classes.
			CO3	Use wave function as basis for determination of irreducible representations and the Great Orthogonality theorem and its consequence.
			CO4	Solve problem based on point group, matrix representation and character table
			CO5	Construct character table of various point

				group
			CO6	Justify which can take part in bonding on the basis of SALCs and point group of molecules.
M.Sc. I	CHE-503	Organic Chemistry-I	CO1	Understand the concepts of chemical bonding, various structural effects, acids and bases, intermediates and aromaticity.
			CO2	Learn the concepts of stereochemistry.
			CO3	Understand and identify the types of organic reactions.
			CO4	Advanced knowledge of various stereochemical aspects.
			CO5	Establish mechanistic knowledge of aliphatic and aromatic substitutions, and oxidation-reduction reactions
			CO6	Develop problem solving ability of the students.
M.Sc. I	CHE-504	Physical Chemistry Practical I	CO1	Students will grasp the concept of reaction rate and its significance in Chemical Kinetics.
			CO2	Students will learn how to use experimental data to deduce rate laws and rate constants
			CO3	Students will be familiar with the fundamental principles of colorimetry and spectrophotometry including Beer's law, Lambert- Beer's law and the relationship between absorbance and concentration.
			CO4	Students will be able to operate the instruments like spectrophotometer and colorimeter.
			CO5	Students will be able to determine the densities of the solutions and can calculate molar volumes
M.Sc. I	CHE-505	Inorganic Chemistry Practical-I (Inorganic Material analysis, Synthesis and Its Applications)	CO1	Prepare solution of required conc. and the handle laboratory equipment properly.
			CO2	Perform experiment accurately and able to perform calculation.
			CO3	Explain experiment and principal of experiment in detail.
			CO4	Perform calculations and discuss results and write conclusions of the experiment.

			CO5	Apply knowledge to a) design experiment for given aim or modify experiment to enhance results. b) to find out lacuna in experimental procedure.
			CO6	Solve problem/ numerical depending on given experimental data / information.
M.Sc. I	CHE-506,	Organic Chemistry Practical I (Single stage preparation and purification techniques)	CO1	Understand the theoretical aspects behind separation, purification and synthesis of organic compounds.
			CO2	Acquire the experimental skills for separation, purification, identification and synthesis of organic compounds.
			CO3	Design experimental set up for performing the organic reactions.
			CO4	Monitor the organic reactions.
			CO5	Describe the mechanistic aspects of organic reactions.
			CO6	Develop problem solving ability.
M.Sc. I	CHE-507(C)	Analytical Chemistry	CO1	Define/memorize GLP, Lab Safety, Quality assurance
			CO2	Discuss good laboratory practices, laboratory emergencies, and mass spectrometry
			CO3	Apply their knowledge to prepare quality assurance reports, emergencies in the laboratory
			CO4	Differentiate between different ionization technique, compare hazardous and nonhazardous material handling
			CO5	Explain the Quality Assurance, Laboratory Accreditation, Laboratory Emergencies, different ionization technique
			CO6	Applications of GLP, Lab Safety, mass spectrometry
M.Sc-I	CHE-508,	Research methodology	CO1	Develop a comprehensive understanding of different research methodologies and their applications in mathematics.
			CO2	Cultivate critical thinking and analytical skills necessary for identifying research problems and formulating research questions.
			CO3	Provide practical experience in designing experiments, collecting and analyzing

				data, and interpreting research results
			CO4	Foster effective communication skills for presenting research findings orally and in written form.
			CO5	Promote ethical research practices and awareness of responsible conduct in mathematical research
			CO6	Develop problem solving ability
SEMESTER II				
M.Sc-I	CHEOD-551	Physical Chemistry-II (Molecular Spectroscopy)	CO1	Remember basic concepts of molecular spectroscopy, selection rules, intensity of spectral lines and width of spectral transition.
			CO2	Understand principles and applications of rotational, vibrational, raman, electronic and mossbauer spectroscopy.
			CO3	Apply various spectroscopic techniques for gaining insights into molecular structure
			CO4	Analyse vibrating diatomic molecule, simple harmonic and anharmonic oscillator, Scattering of light and Raman Spectrum.
			CO5	Evaluate bond length, vibrational frequency, force constant and dissociation energy using spectral data.
			CO6	Create awareness about rotational fine structure, vibrational coarse structure, Quadrupole effects
M.Sc. I	CHE-552	CHE-552: Inorganic Chemistry-II (Coordination and Bioinorganic Chemistry)	CO1	Define R. S. term, configuration, microstate, paramagnetic, diamagnetic ferromagnetic, antiferromagnetic, Curie and Neel temperature.
			CO2	Identify complex ions showing same R.S. terms, degeneracy of ground state terms of metal ions, and spin multiplicities of different configurations.
			CO3	Interpret electronic spectra for spin allowed Oh and Td complexes using Orgel diagram, Magnetic properties of A, E and T ground terms in complexes and selection rules.

			CO4	Calculate frequencies of absorption spectrum, 10Dq, Racah and nepholauxetic parameter for a complex, and magnetic moments of complexes
			CO5	Define metalloproteins, metallo-eznymes, photosynthesis, HSAB concept, nucleic acids, metalloregulation, Biopolymer effects and acetylcholine receptor.
			CO6	Explain chelate effect and Irving-William series, pKa values of coordinated ligands, Tuning of redox potential, and Reactions of coordinated ligands.
			CO7	Describe Fe-S clusters, model compounds and spontaneous self-assembly, metals in medicine, blue copper proteins, and cytochromes, and Na/K pumps.
			CO8	Distinguish between hemoglobin and myoglobin, transferrin and ferritin, photosystem-I and photosystem-II.
M.Sc. I	CHE-553	Organic Chemistry-II (Pericyclic Reactions, Molecular Rearrangements, Photochemistry and Organic Spectroscopy)	CO1	Understand the concepts of pericyclic and photochemical reactions, and molecular rearrangements
			CO2	Learn concepts of Organic Spectroscopy.
			CO3	Identify the type of pericyclic and photochemical reactions
			CO4	Solve the problems based on pericyclic and photochemical reactions and molecular rearrangements
			CO5	Deduce the structure from the spectral data and justify the findings
			CO6	Develop problem solving ability of the students.
M.Sc. I	CHE-554	Physical Chemistry Practical II	CO1	Students will grasp the fundamental principles of Conductometry, Polarography, Potentiometry and pH metry.
			CO2	Students will familiar with the operation of Conductometer, Polarimeter, Potentiometer and pH meter
			CO3	Students will understand the concepts of conductance, resistance and learn how to calculate and interpret these values.

			CO4	Students will learn to interpret polarographic waves and understand their significance in identifying electroactive species and determining their concentration.
			CO5	Students will explore the applications of Potentiometry in various fields such as acid- base titrations, determination of pH and analysis of ionic concentration
M.Sc. I	CHE-555	Inorganic Chemistry Practical-II	CO1	Define coordination complex, cell constant, resistance, specific conductance, equilibrium constant, absorbance, Beer's law, solubility product, chromatography, etc.
			CO2	Discuss photochemistry of potassium trioxalatoferrate complex, kinetics of formation of Cr(III)-EDTA, Determination of Cu(II)and Fe (II) by solvent extraction technique.
			CO3	Outline the flow-chart for synthesis of [Mn(acac)3], Chloropentaamminecobalt(III) chloride, Nitro pentaamminecobalt(III) chloride, Bis[TrisCu(I)thiourea complexes.
			CO4	Estimate purity of the [Mn(acac)3], Chloropentaamminecobalt(III) chloride, Nitro pentaamminecobalt(III) chloride, Bis[TrisCu(I)thiourea complexes.
			CO5	Determine equilibrium constant of M – L systems Fe(III)–Sulphosalicylic acid, magnetic susceptibility (χg and χm) of mercury tetracyanato cobalt or Fe(acac) and magnetic susceptibility (χg and χm) of mercury tetracyanato cobalt or Fe(acac).
			CO6	Calculate the quantity from observation of the experiments and Interpret the result obtained respective experiments.
M.Sc. I	CHE-556,	Organic Chemistry Practical II (Single stage preparations with spectral analysis and Two stage preparations)	CO1	Understand the theoretical concepts behind organic synthesis
			CO2	Acquire the experimental skills for separation, purification, identification and synthesis of organic compounds..
			CO3	Perform thin layer chromatography. Design experimental set up for performing the organic reactions
			CO4	Monitor the organic reactions and analyse the products using spectral results.

			CO5	Describe the mechanistic aspects of organic reactions.
			CO6	Develop problem solving ability..
M.Sc. I	CHE-557 (C)	Green Chemistry	CO1	Apply the principles of green chemistry to chemical processes.
			CO2	Apply the principles of green chemistry to reduce the cost of chemical processes
			CO3	Develop economical synthetic route involving principles of green chemistry.
			CO4	Analyze chemical data and choose safer and renewalbe raw materials for chemical processes.
			CO5	Develop processes in accordance with Sustainable Development Goals.

SEMESTER III				
M.Sc. II	CCTP-7, CHO-350	Organic Reaction Mechanism and Biogenesis	**CO1**	After successfully completing this course, students will be able to: Explain the Reaction Mechanisms.
			CO2	Free radical generation , stability and their application.
			CO3	Cleavage of C-Heteoatom and formation of free radicals.
			CO4	Linear Free Energy Relationships with Hammet equation, deviation and effects of substituents on the ring.
			CO5	.Insight of alkaloids, Terpenoids and

				The Shikimate pathway.
			CO6	Alkaloids isolated from the Roots of Piper nigrum.
M.Sc. II	CCTP-8, CHO-351	Structure Determination of Organic Compounds by Spectroscopic Methods	**CO1**	After successfully completing this course, students will be able to: Explain principles of NMR techniques.
			CO2	NOE and its application.
			CO3	APT, DEPT and INEPT techniques.
			CO4	Elucidation of organic compounds, catalysts and biomolecules
			CO5	COSY and TOCSY techniques of NMR.
			CO6	2D-INADEQUATE, 2D- ADEQUATE, NOESY, ROESY (b) Heteronuclear: HSQC, HMQC and HMBC techniques.
			CO7	Principles of Mass Spectrometry
			CO8	ionization methods like EI, CI, ES, MALDI and FAB-Fragmentation.
			CO9	Isotopic Abundance in structure establishment.
			CO10	Analysis of Biomolecules.
			CO11	Structure elucidation using UV using different techniques.
M.Sc. II	CCTP-9, CHO-352	Stereochemistry and Asymmetric Synthesis of Organic Compounds	**CO1**	After successfully completing this course, students will be able to: Stereochemistry of polysubstituted cyclohexane, six membered rings with SP2 carbon, heterocycles with N and O.
			CO2	stereochemical principles involved in reactions of six membered rings and other than six membered rings.
			CO3	Stereochemistry of fused and bridged ring systems.
			CO4	Nomenclature, synthesis; stereochemical aspects of Perhydrophenanthrene.
			CO5	Perhydroanthracene, hydrindane, Steroids; Bridged system.
			CO6	Conformations of substituted cyclohexanes.
			CO7	Determination of configuration,
			CO8	Resolution and analysis of stereomers - formation of racemization and methods of resolution.

			CO9	Asymmetric Synthesis, Chirol pool and Chiral auxillaries.
			CO10	Transition Metal-Catalyzed Homogeneous Asymmetric Hydrogenation.
			CO11	Transition Metal-Catalyzed Homogeneous Asymmetric Hydroxylation and Epoxidation
M.Sc. II	CHO-353(B)	Designing Organic Syntheses and Heterocyclic Chemistr	**CO1**	After successfully completing this course, students will be able to explain: Concepts of Retrosynthes**is**
			CO2	Retrosynthetic analysis.
			CO3	disconnection approach, Synthons, multiple step synthesis.
			CO4	Retrosynthesis and synthesis of following Molecules: Strychnine, Reserpine, Thienamycin, Asteltoxin, Indolizomycin, Erythronolide B.
			CO5	Systematic nomenclature monocyclic, fused and bridged heterocycles.
			CO6	General chemical behaviour of heterocyclic compounds and their applications.
			CO7	Common Methods in Ring Synthesis of Aromatic Heterocyclic Systems.
M.Sc. II	CCPP-3, CHO-354	Practical-I Solvent Free Organic Synthesis	**CO1**	After successfully completing this course, students will be able to: Explain Solvent Free Carbon–Carbon Bond Formation.
			CO2	Solvent-Free C–N Bond Formation
			CO3	Solvent-Free C–S Bond Formation
			CO4	Solvent-Free C–X Bond Formation
			CO5	Solvent-Free N–N Bond Formation
			CO6	Solvent free supramolecular assembly formation
SEMESTER IV				
M.Sc. II	CCTP-10, CHO-450	Chemistry of Natural Products	**CO1**	After successfully completing this course, students will be able to learn: Understanding and planning of total synthesis while maintaining the

				stereochemistry.
			CO2	Explain total Synthesis Hirsutellone.
			CO3	Explain total Synthesis Ribisins.
M.Sc. II	CCTP-11, CHO-451	Organometallic Reagents in Organic Synthesis	**CO1**	After successfully completing this course, students will be able to: Explain use of transition metal complexes in organic synthesis.
			CO2	Explain C=C formation reactions.
			CO3	Illustration of Ring formation reactions.
			CO4	Idea behind the Click chemistry: criterion for click reaction.
			CO5	Explain concept of Metathesis.
			CO6	Explain the use of Boron and Silicon reagents in organic synthesis
			CO7	Illustrate the preparation and management of fish culture ponds.
			CO8	Demonstrate the methods of packaging and transport of fish and brood fish.
			CO9	Illustrate techniques of fish harvesting, preservation & processing.
			CO10	Compare the techniques used in fishery development.
M.Sc. II	CBOP-4, CHO-452(A)	Concepts and Applications of Medicinal Chemistry	**CO1**	After successfully completing this course, students will be able to: Explain Proteins as biological catalyst Nucleic acids.
			CO2	Explain Principle of drug design, Chemistry of diseases and Drug development.
			CO3	Explain Peptides, sequencing and applications in therapeutics.
			CO4	Explain Design of Oxamniquine.
			CO5	Explain Pharmacokinetics and Pharmacodynamics.
			CO6	Explain Structure and activity Relationship: QSAR And application.
M.Sc. II	CBOP-5, CHO-453	Practical-III Section-I: Ternary Mixture Separation	**CO1**	After successfully completing this course, students will be able to: Understand and employ concept of type determination and separation.
			CO2	Perform qualitative estimation of

		Section-II: Carbohydrates Synthesis and Isolation Natural Products		functional groups
			CO3	Recrystallize /distill the separated compounds.
			CO4	Carbohydrate Synthesis.
			CO5	Isolation of pigments from the natural products.
			CO6	Isolation of essential oils from the natural products.
			CO7	Isolation of medicinally important component from the natural products
			CO8	Students should carry out a small research project.
			CO9	Becomes familiar with i. Literature survey, research methodologies, Column and TLC chromatographic techniques
M.Sc. II	CCPP-04, CHO-454: Practical-II:	Convergent and Divergent Organic Syntheses	**CO1**	After successfully completing this course, students will be able to: Learn convergent Synthesis involving acylation, reduction.
			CO2	Divergent Synthesis involving acylation, nitration, One pot synthesis,
			CO3	Resolution technique)
			CO4	Sulfonation reaction
			CO5	Three Stage Syntheses.

Name of the Programme: B. Sc. (Computer Science)

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
F.Y.B.Sc .(Computer Science)	CS - 101	Problem Solving Using Computer and 'C' Programming - I	**CO1**	Explore algorithmic approaches to problem solving.
			CO2	Develop modular programs using control structures and arrays in 'C'.
F.Y.B.Sc. .(Computer Science)	CS - 102	Database Management Systems	**CO1**	Solve real world problems using appropriate set, function, and relational models
			CO2	Design E-R Model for given requirements and convert the same into database tables.
			CO3	Use SQL.
F.Y.B.Sc. .(Computer Science)	CS - 103	Practical course on Problem Solving using Computer and 'C' programming and Database Management Systems	**CO1**	On completion of this course, students will be able to .Devise pseudo codes and flowchart for computational problems.
			CO2	Write, debug and execute simple programs in 'C'.
			CO3	Create database tables in postgreSQL.
			CO3	Write and execute simple, nested queries.
SEMESTER II				
F.Y.B.Sc .(Computer Science)	CS - 201	Advanced 'C' Programming	**CO1**	The student will be able to Develop modular programs using control structures, pointers, arrays, strings and structures
			CO2	The student understands the importance Design and develop solutions to real world problems using C.
F.Y.B.Sc .(Computer Science)	CS - 202	Relational Database Management Systems	**CO1**	On completion of the course, student will be able to Design E-R Model for given requirements and convert the same into database tables.
			CO2	Use database techniques such as SQL & PL/SQL..
			CO3	Explain transaction Management in relational database System responsible for our performance in life.
			CO4	Use advanced database Programming concepts.
F.Y.B.Sc .(Computer	CS - 203	Practical Course on Advanced 'C'	**CO1**	On completion of this course, students will be able to :

Science)		Programming and Relational Database Management Systems		Write, debug and execute programs using advanced features in 'C'.
			CO2	To use SQL & PL/SQL
			CO3	To perform advanced database operations
SEMESTER III				
S.Y.B.Sc (Computer Science).	CS - 231	Data Structures and Algorithms – I	**CO1**	On completion of the course, student will be able to To use well-organized data structures in solving various problems..
			CO2	To differentiate the usage of various structures in problem solution
			CO3	Implementing algorithms to solve problems using appropriate data structures.
S.Y.B.Sc. (Computer Science).	CS - 232	Software Engineering	**CO1**	On completion of the course, student will be able to Compare and chose a process model for a software project development.
			CO2	Identify requirements analyze and prepare models.
			CO3	Prepare the SRS, Design document, Project plan of a given software system.
S.Y.B.Sc. (Computer Science).	CS - 233	Practical course on CS 231 (Data Structures and Algorithms I) and CS 232 (Software Engineering)	**CO1**	student will be able to To use well-organized data structures in solving various problems.
			CO2	Implementing algorithms to solve problems using appropriate data structures.
			CO3	Prepare detailed statement of problem for the selected mini project
			CO4	Identify suitable process model for the same
			CO5	Develop Software Requirement Specification for the project.
			CO6	Identify scenarios and develop UML Use case
			CO7	Other artifacts: Class Diagram, activity diagram, sequence diagram, component diagram and any other diagrams as applicable to the project.
SEMESTER IV				
S.Y.B.Sc. (Computer Science).	CS - 241	Data Structures and Algorithms - II	**CO1**	On completion of this course students will be able to Implementation of different data structures efficiently.

			CO2	The students will able to understand the Usage of well-organized data structures to handle large amount of data
			CO3	The students will be able to understand Usage of appropriate data structures for problem solving.
S.Y.B.Sc. (Computer Science).	CS - 242	Computer Networks-I	**CO1**	Have a good understanding of the OSI and TCP/IP Reference Models and in particular have a good knowledge of Layers.
			CO2	The learner understands the basic Understand the working of various protocols..
			CO3	Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies.
S.Y.B.Sc. (Computer Science)	CS - 243	Practical course on CS 241(Data Structures and Algorithms II) and CS 242 (Computer Networks I)	**CO1**	The students will able to understand the codes should be uploaded on either the local server, Moodle, Github or any open source LMS.
			CO2	To understand the basic commands run on cmd. And find the information about the computer pursuing the protocol and different types of address which is required to make communication possible over the network.
			CO3	To understand & identify the class full addressing in IPV4.
SEMESTER V				
T.Y.B.Sc. (Computer Science)	CS - 351	Operating Systems – I	**CO1**	After completion of this course students will be able to understand the concept of Processes and Thread Scheduling by operating system
			CO2	Synchronization in process and threads by operating system
			CO3	Memory management by operating system using with the help of various schemes.
T.Y.B.Sc. (Computer Science)	CS - 352	Computer Networks - II	**CO1**	On completion of the course, student will be able to Student will understand the different protocols of Application layer..
			CO2	Develop understanding of technical aspect

				of Multimedia Systems
			CO3	Develop various Multimedia Systems applicable in real time
			CO4	Identify information security goals.
			CO5	Understand, compare and apply cryptographic techniques for data security.
T.Y.B.Sc. (Computer Science)	CS - 353	Web Technologies - I	**CO1**	Learners shall be able to understand basic concepts and Web Page
			CO2	On completion of the course, student will be able to Understand how to develop dynamic and interactive Web Page
T.Y.B.Sc. (Computer Science)	CS - 354	Foundations of Data Science	**CO1**	On completion of the course, student will be able to– Perform Exploratory Data Analysis
			CO2	Obtain, clean/process, and transform data
			CO3	Detect and diagnose common data issues, such as missing values, special values, outliers, inconsistencies, and localization
			CO4	Demonstrate proficiency with statistical analysis of data.
			CO5	Present results using data visualization techniques
			CO6	Prepare data for use with a variety of statistical methods and models and recognize how the quality of the data and the means of data collection may affect conclusions.
T.Y.B.Sc. (Computer Science)	CS - 355	Object Oriented Programming using Java - I	**CO1**	On completion of the course, student will be able to– Understand the concept of classes, object, packages and Collections.
			CO2	To develop GUI based application.
T.Y.B.Sc. (Computer Science)	CS - 356	Theoretical Computer Science	**CO1**	On completion of the course, student will be able to– Understand the use of automata during language design.
			CO2	Relate various automata and Languages
T.Y.B.Sc. (Computer Science)	CS - 357	Practical Course based on CS - 351	**CO1**	After completion of this course students will be able to understand the concept of Process synchronization
			CO2	Processes and Thread Scheduling by operating system
			CO3	Memory management by operating system using with the help of various schemes
T.Y.B.Sc. (Computer	CS - 358	Practical Course based on CS -	**CO1**	Understand how to develop dynamic and interactive Web Page.

Science)		353 and CS - 354	**CO2**	Prepare data for use with a variety of statistical methods and recognize how the quality of the data may affect conclusions.
			CO3	Perform exploratory data analysis.
T.Y.B.Sc. (Computer Science)	CS - 359	Practical Course based on CS - 355	**CO1**	Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs
			CO2	Read and make elementary modifications to Java programs that solve real-world problems.
			CO3	Validate input in a Java program.
T.Y.B.Sc. (Computer Science)	CS-3510	Python Programming	**CO1**	On completion of the course, student will be able to– Develop logic for problem solving
			CO2	Determine the methods to create and develop Python programs by utilizing the data .
			CO3	structures like lists, dictionaries, tuples and sets.
			CO4	To be familiar about the basic constructs of programming such as data, operations, conditions, loops, functions etc.
			CO5	To write python programs and develop a small application project.
T.Y.B.Sc. (Computer Science)	CS-3511	Blockchain Technology	**CO1**	On completion of the course, student will be able to– Learn the fundamentals of Blockchain Technology.
			CO2	Learn Blockchain programming
			CO3	Basic knowledge of Smart Contracts and how they function.
SEMESTER VI				
T.Y.B.Sc. (Computer Science)	CS - 361	Operating Systems-II	**CO1**	After completion of this course students will be able to understand the concept of Management of deadlocks and File System by operating system
			CO2	Scheduling storage or disk for processes
			CO3	Distributed Operating System and its architecture and the extended features in mobile OS.
T.Y.B.Sc. (Computer	CS - 362	Software Testing	**CO1**	To understand various software testing methods and strategies.

Science)			**CO2**	To understand a variety of software metrics, and identify defects and managing those defects for improvement in quality for given software.
			CO3	To design test cases and test plans, review reports of testing for qualitative software.
			CO4	To understand latest testing methods used in the software industries
T.Y.B.Sc. (Computer Science)	CS - 363	Web Technologies - II	**CO1**	On completion of the course, student will be able to– Build dynamic website.
			CO2	Using MVC based framework easy to design and handling the errors in dynamic website
T.Y.B.Sc. (Computer Science)	CS - 364	Data Analytics	**CO1**	On completion of the course, student will be able to– Use appropriate models of analysis, assess the quality of input, and derive insight from results.
			CO2	Analyze data, choose relevant models and algorithms for respective applications
			CO3	Understand different data mining techniques like classification, prediction, clustering and association rule mining
			CO4	Apply modeling and data analysis techniques to the solution of real world business problems
T.Y.B.Sc. (Computer Science)	CS - 365	Object Oriented Programming using Java – II	**CO1**	On completion of the course, student will be able to– To access open database through Java programs using JDBC and develop the application
			CO2	Understand and Create dynamic web pages, using Servlets and JSP.
			CO3	Work with basics of framework to develop secure web applications.
T.Y.B.Sc. (Computer Science)	CS - 365	Object Oriented Programming using Java – II	**CO1**	On completion of the course, student will be able to– Access open database through Java programs using Java Data Base Connectivity (JDBC) and develop the application
			CO2	Understand and Create dynamic web pages, using Servlets and JSP.
			CO3	Work with basics of framework to develop secure web applications.
T.Y.B.Sc. (Computer	CS - 366	Compiler Construction	**CO1**	On completion of the course, student will be able to–

Science)				Understand the process of scanning and parsing of source code
			CO2	Learn the conversion code written in source language to machine language.
			CO3	Understand tools like LEX and YACC.
T.Y.B.Sc. (Computer Science)	CS - 367	Practical Course based on CS - 361	**CO1**	After completion of this course students will be able to understand the concept of Management of deadlocks by operating system
			CO2	File System management
			CO3	Disk space management and scheduling for processes
T.Y.B.Sc. (Computer Science)	CS - 368	Practical Course based on CS - 363 and CS - 364	**CO1**	Build dynamic website
			CO2	Using MVC based framework easy to design and handling the errors in dynamic website.
T.Y.B.Sc. (Computer Science)	CS - 369	Practical Course based on CS - 365	**CO1**	To Learn database Programming using Java
			CO2	Understand and Create dynamic web pages using Servlets and JSP.
			CO3	Work with basics of framework to develop secure web applications
T.Y.B.Sc. (Computer Science)	CS - 3610	Software Testing Tools	**CO1**	To understand various software testing methods and strategies
			CO2	To understand a variety of software metrics and identify defects and managing those defects for improvement in quality for given software.
			CO3	To design test cases and test plans, review reports of testing for qualitative software.
			CO4	To understand latest testing tools used in the software industries.
T.Y.B.Sc. (Computer Science)	CS - 3611	Project	**CO1**	To understand the use of technologies how it will be implemented while developing the project. And students must co-relate their knowledge and have confident to represent with well understanding facts.

POST GRADUATE COURSE OTCOMES
Name of the Programme: M.Sc. (Computer Science)

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
M.Sc. I	CS-501-MJ	Advanced Operating System	CO1	CO1: Understand the Operating Systems Structure with example of Unix/Linux.
			CO2	Learn the structure of files and directory in UNIX/LINUX OS.
			CO3	Use various system calls related to file subsystem.
			CO4	Learn the process control subsystem structure in UNIX/LINUX OS
			CO5	Use various system calls related to process control subsystem.
			CO6	Learn the concept of signal handling with practical implementation
			CO7	Understand the memory management policies of UNIX/LINUX OS
M.Sc. I	CS-502-MJ	Artificial Intelligence	CO1	Understand the fundamental concepts of Artificial Intelligence.
			CO2	Identify and apply appropriate search strategies for AI problem.
			CO3	Identify knowledge and represent AI algorithms using various techniques.
			CO4	Implement ideas to design and develop AI solutions for complex challenges.
			CO5	Analyse the performance of AI models and interpret their results.
			CO6	Implement ideas underlying modern logical inference systems.
			CO7	Understand recent trends and future scope of AI.
M.Sc. I	CS-503-MJ	Principles of Programming Language	CO1	Separate syntax from semantics
			CO2	Compare programming language designs
			CO3	Understand their strengths and weaknesses
			CO4	Learn new languages more quickly
			CO5	Understand basic language implementation techniques

			CO6	Learn small programs in different programming Languages
M.Sc. I	CS-504-MJP	Lab Course on CS-501-MJ (Advanced Operating System)	CO1	Understand the Operating Systems Structure with example of Unix/Linux.
			CO2	Learn the structure of files and directory in UNIX/LINUX OS.
			CO3	Use various system calls related to file subsystem.
			CO4	Learn the process control subsystem structure in UNIX/LINUX OS
			CO5	Use various system calls related to process control subsystem.
			CO6	Learn the concept of signal handling with practical implementation
M.Sc. I	CS-505-MJP	Lab Course on CS-502-MJ (Artificial Intelligence)	CO1	Understand the fundamental concepts of Artificial Intelligence.
			CO2	Identify and apply appropriate search strategies for AI problem.
			CO3	Identify knowledge and represent AI algorithms using various techniques.
			CO4	Implement ideas to design and develop AI solutions for complex challenges.
			CO5	Analyze the performance of AI models and interpret their results.
			CO6	Implement ideas underlying modern logical inference systems.
			CO7	Understand recent trends and future scope of AI.
M.Sc. I	CS-510-MJ	Advance Databases and Web Technologies	CO1	Students will get knowledge of advance database technology
			CO2	Students will be able to choose appropriate database technology as per application
			CO3	Students will learn to design responsive web application
			CO4	Students could design and implement scalable web application
M.Sc. I	CS-511-MJP	Lab Course on CS-510-MJ (Advance Databases and Web Technologies)	CO1	Students will get knowledge of advance database technology
			CO2	Students will be able to choose appropriate database technology as per application
			CO3	Students will learn to design responsive web application
			CO4	Students could design and implement scalable web application
M.Sc. I	CS-512-MJ	Cloud Computing	CO1	To understand the principles of cloud computing
			CO2	To understand the importance of virtualization and how it has helped the development of cloud computing.

			CO3	To understand the concept of cloud security.
			CO4	To design and deploy cloud infrastructure.
			CO5	To understand the concept of edge computing
M.Sc. I	CS-513-MJP	Lab Course on CS-512-MJ (Cloud Computing)	CO1	To understand the principles of cloud computing
			CO2	To understand the importance of virtualization and how it has helped the development of cloud computing.
			CO3	To understand the concept of cloud security.
			CO4	To design and deploy cloud infrastructure.
M.Sc. I	CS-514-MJ	C# .NET Programming	CO1	Understand the features of Dot Net Framework along with the features of C#
			CO2	Interpret and Develop Interfaces for real-time applications.
			CO3	Design & implement Object Oriented Programming concepts like Inheritance and Polymorphism in C# programming language.
			CO4	Design & Implement the application using multithreading & File handling
			CO5	Design and Implement Windows Application using Windows Forms & tools application using Database in C#
			CO6	Design and Implement Custom Application Using Windows Form & ADO.NET in C#
M.Sc. I	CS-515-MJP	Lab Course on CS-514-MJ (C# .NET Programming)	CO1	Understand the features of Dot Net Framework along with the features of C#
			CO2	Interpret and Develop Interfaces for real-time applications.
			CO3	Design & implement Object Oriented Programming concepts like Inheritance and Polymorphism in C# programming language.
			CO4	Design & Implement the application using multithreading & File handling
			CO5	Design and Implement Windows Application using Windows Forms & tools application using Database in C#
			CO6	Design and Implement Custom Application Using Windows Form & ADO.NET in C#
M.Sc. I	CS-531-RM	Research Methodology	CO 1	Understand of the fundamental concepts of research, including the research process, research questions, hypotheses, and variables.
			CO 2	Conduct a comprehensive literature review to identify relevant studies, synthesize existing knowledge, and identify research gaps.
			CO 3	Identify research problems, formulate research questions, and design appropriate methodologies to address these problems
			CO 4	Identify and select appropriate research designs, such as experimental, observational, survey,

				qualitative, or mixed-methods, based on the research objectives.
			CO 5	Apply appropriate data analysis methods, including statistical techniques or qualitative analysis, to draw meaningful conclusions from research data.
			CO 6	Develop a well-structured research proposal, outlining research questions, methodology, expected outcomes, and a rationale for the study.
			CO 7	Communicate research findings effectively through written reports, presentations, and academic papers.
			CO 8	Gain an appreciation for the importance of research in contributing to the advancement of knowledge in their field of study and broader society.
			CO 9	Understand the principles of research ethics and integrity and apply them in their research.
SEMESTER II				
M.Sc. I	CS-551-MJ	Design and Analysis of Algorithms	CO1	Analyze worst-case running times of algorithms using asymptotic analysis.
			CO2	Compare between different data structures. Pick an appropriate data structure for a design situation.
			CO3	Ability to design algorithms using standard paradigms like: Greedy, Divide and Conquer, Dynamic Programming and Backtracking.
			CO4	Able to Explain the major graph algorithms and Employ graphs to model engineering problems, when appropriate.
			CO5	Able to compare between different data structures and pick an appropriate data structure for a design situation.
M.Sc. I	CS-552-MJ	Mobile App Development Technologies	CO 1	To provide students with a solid understanding of the mobile app development, Android operating system, its architecture, components, and the software development kit (SDK).
			CO 2	To teach students how to build Android applications from scratch, including UI design, handling user interactions, and integrating various features.
			CO 3	To learn about Android's UI components, layouts, and design principles to create visually appealing and user-friendly interfaces.
			CO 4	To know various methods of data storage in Android applications, such as using SQLite databases, shared preferences, and cloud-based solutions.

			CO 5	To empower students to independently design, develop, and deploy their Android applications using advanced android tools.
			CO 6	To understand how to utilize built-in sensors and hardware components on Android devices, such as GPS, accelerometer, Bluetooth, WiFi, Media Player and Camera, in their applications.
			CO 7	To Get knowledge of Phone Gap Programming
M.Sc. I	CS-553-MJ	Software Project Management	CO1	Learn the skills that are required to ensure successful medium and large scale software projects.
			CO2	Examine Requirements Elicitation, Project Management, Verification &Validation and Management of Large Software Engineering Projects.
			CO3	Get knowledge to select and apply project management techniques for process modeling, planning, estimation, process metrics and risk management.
			CO4	Understand the concepts, skills, tools, and techniques of software project management.
M.Sc. I	CS-554-MJP	Lab Course on CS-551-MJ (Design and Analysis of Algorithms)	CO1	Analyze worst-case running times of algorithms using asymptotic analysis.
			CO2	Compare between different data structures. Pick an appropriate data structure for a design situation.
			CO3	Ability to design algorithms using standard paradigms like: Greedy, Divide and Conquer, Dynamic Programming and Backtracking.
			CO4	Able to Explain the major graph algorithms and Employ graphs to model engineering problems, when appropriate.
			CO5	Able to Compare between different data structures and pick an appropriate data structure for a design situation.
M.Sc. I	CS-555-MJP	Lab Course on CS-552-MJ (Mobile App Development Technologies)	CO1	To teach students how to build Android applications from scratch, including UI design, handling user interactions, and integrating various features.
			CO2	To learn about Android's UI components, layouts, and design principles to create visually appealing and user-friendly interfaces.
			CO3	To empower students to independently design, develop, and deploy their Android applications using advanced android tools.
M.Sc. I	CS-560-MJ	Full Stack Development-I	CO1	Learn about the benefits of using MEAN stack and how to install and configure it
			CO2	Learn advanced ES6 features in JavaScript and Typescript

			CO3	Learn about Angular architecture, components, directives, pipes, forms, routing, and services.
			CO4	Learn about the event loop, asynchronous programming, modules, packages, and streams.
			CO5	Learn about the MVC pattern, routing, HTTP requests and responses, middleware, and error handling.
			CO6	Create a full-stack MEAN stack application and deploy it to a production/local server.
M.Sc. I	CS-561-MJP	Lab Course on CS-560-MJ (Full Stack Development-I)	CO1	Describe appropriate uses for JavaScript and PHP
			CO2	Discuss, create, and debug semantically correct basic examples of dynamic web pages
			CO3	Construct individual components and entire applications using ReactJS
			CO4	Build an interactive web page using ReactJS
M.Sc. I	CS-562-MJ	Web Services	CO1	Understand the web services and SOA
			CO2	Understand Web Services Architecture.
			CO3	Understand the working of SOAP and developing SOAP Web Services using Java.
			CO4	To get acquainted with the details of web services technologies like WSDL, UDDI.
			CO5	To understand the concept of RESTful services.
M.Sc. I	CS-563-MJP	Lab Course on CS-562-MJ (Web Services)	CO1	Understand the web services and SOA
			CO2	Understand Web Services Architecture.
			CO3	Understand the working of SOAP and developing SOAP Web Services using Java.
			CO4	To get acquainted with the details of web services technologies like WSDL, UDDI.
			CO5	To understand the concept of RESTful services.
M.Sc. I	CS-564-MJ	ASP .NET Programming	CO1	Understand the features of Dot Net Framework along with the features of ASP
			CO2	Interpret and Develop Interfaces for real-time applications.
			CO3	Design & implement Object Oriented Programming concepts like Inheritance and Polymorphism in ASP programming language.
			CO4	Design & Implement the application using multithreading & File handling
			CO5	Design and Implement Windows Application using Windows Forms & tools application using Database in ASP
			CO6	Design and Implement Custom Application Using Windows Form & ADO.NET in ASP
M.Sc. I	CS-565-MJP	Lab Course on CS-564-MJ (ASP .NET Programming)	CO1	Understand the features of Dot Net Framework along with the features of ASP
			CO2	Interpret and Develop Interfaces for real-time applications.

			CO3	Design & implement Object Oriented Programming concepts like Inheritance and Polymorphism in ASP programming language.
			CO4	Design & Implement the application using multithreading & File handling
			CO5	Design and Implement Windows Application using Windows Forms & tools application using Database in ASP
			CO6	Design and Implement Custom Application Using Windows Form & ADO.NET in ASP
M.Sc. I	CS-581-OJT	On Job Training (Internship)	CO1	Enhance the knowledge related to various tools and technologies used in industry
			CO2	Improve the ability to solve complex problems independently and creatively
			CO3	Effectively utilize critical thinking and analytical skills in tackling real world challenges
			CO4	Effectively communicate and collaborate skills through interaction with team members and mentors.
			CO5	Get an experience in working on projects or related working within industry
			CO6	Develop the ability to document process, design, implementation and testing
			CO7	Familiar with specific industry domain relevant to internship
			CO8	Complete projects and tasks as per the predetermined objectives
SEMESTER III				
M.Sc. II	CS-601-MJ	Software Architecture and Design Pattern	CO1	Understand the UML basics, RUP and basics of software architecture
			CO2	Acknowledge the traits of patterns that make them helpful in solving real-world issues.
			CO3	Able to use specific frameworks as per applications need.
			CO4	Design java application using design pattern techniques
M.Sc. II	CS-602-MJ	Machine Learning	CO1	To introduce knowledge of Machine Learning.
			CO2	To demonstrate all categories of Machine learning algorithms along with implementation.
			CO3	To compose real time application using machine learning algorithms.
			CO4	Analyze the concept of neural networks for learning linear and non-linear activation functions.
M.Sc. II	CS-603-MJ	Internet of Things	CO1	Demonstrate basic concepts, principles and challenges in IoT.
			CO2	Illustrate functioning of hardware devices and sensors used for IoT.

			CO3	Analyze network communication aspects and protocols used in IoT.
			CO4	Apply IoT for developing real life applications using Ardunio programming.
			CO5	To develop IoT infrastructure for popular applications.
M.Sc. II	CS-604-MJP	Lab Course on CS-601-MJ and CS-603-MJ (Software Architecture & Design Pattern and Internet of Things)	CO1	Design java application using design pattern techniques.
			CO2	Apply IoT for developing real life applications using Ardunio programming.
			CO3	To develop IoT infrastructure for popular applications.
M.Sc. II	CS-605-MJP	Lab course on CS-602-MJ (Machine Learning)	CO1	To Get Hands on machine learning model.
			CO2	Able to estimate Machine Learning models efficiency using suitable metrics.
			CO3	Able to analysis and make decision for critical problems.
			CO4	Able to handle structured, unstructured as well as semi-structured data.
			CO5	Implement ideas to design and develop Deep learning solutions for complex problems
M.Sc. II	CS-610-MJ	Full Stack Development-II	CO1	Learn In Depth understanding of Angular framework and State Management.
			CO2	Learn using typescript effectively in Angular framework.
			CO3	Learn in-depth knowledge of NodeJS and Express JS.
			CO4	Learn advance concepts in MongoDB.
			CO5	Learn best practices to be followed when creating industry grade applications.
M.Sc. II	CS-611-MJP	Lab course on CS-610-MJ (Full Stack Development-II)	CO1	Learn In Depth understanding of Angular framework and State Management.
			CO2	Learn using typescript effectively in Angular framework.
			CO3	Learn in-depth knowledge of NodeJS and Express JS.
			CO4	Learn advance concepts in MongoDB.
			CO5	Learn best practices to be followed when creating industry grade applications.
M.Sc. II	CS-612-MJ	DevOps Fundamentals	CO1	Apply DevOps principles for collaboration, automation, and continuous improvement.
			CO2	Master version control (e.g., Git) and implement effective branching strategies.
			CO3	Design and optimize CI/CD pipelines for automated and streamlined software delivery.

			CO4	Utilize containerization (e.g., Docker) and orchestration tools (e.g., Kubernetes) for scalable deployments.
			CO5	Implement monitoring, logging, and security practices throughout the DevOps lifecycle.
			CO6	Foster effective collaboration through tools like ChatOps within cross-functional teams.
			CO7	Develop skills in incident response, troubleshooting, and problem resolution.
M.Sc. II	CS-613-MJP	Lab Course on CS-612-MJ (DevOps Fundamentals)	CO1	Demonstrate the ability to practically implement DevOps principles through hands-on assignments in version control, CI/CD, IaC, and containerization
			CO2	Develop problem-solving skills by resolving simulated incidents, enhancing the understanding of incident response and troubleshooting procedures.
			CO3	Attain a comprehensive skill set covering automation, scripting, collaboration tools, and cultural transformation
			CO4	Empowering participants to contribute to a collaborative and efficient DevOps culture.
M.Sc. II	CS-614 MJ	Soft Computing	CO1	Learn about soft computing techniques and their applications
			CO2	Analyze various neural network architectures and perceptrons
			CO3	Define the fuzzy systems
			CO4	Analyze the genetic algorithms and their applications.
M.Sc. II	CS-615-MJP	Practical on CS-614-MJ (Soft Computing)	CO1	Learn about soft computing techniques and their applications
			CO2	Analyze various neural network architectures and perceptrons
			CO3	Define the fuzzy systems
			CO4	Analyze the genetic algorithms and their applications.
M.Sc. II	CS-631-RP	Research Work-I	CO1	Independently conduct research in a specific area of computer science
			CO2	Apply appropriate research methodologies to address research problems.
			CO3	Analyze and synthesize information gathered from literature reviews, experiments, or data analysis
			CO4	Develop innovative solutions to research problems within the scope of computer science.
			CO5	Effectively present research findings through written reports, oral presentations, or poster presentations.

			CO6	Publish research work in reputable journals, present at conferences or in recognized project competitions.
SEMESTER IV				
M.Sc. II	CS-651-MJP	Full Time Industrial Training (IT)	CO1	Apply theoretical concepts learned in the classroom to solve practical problems encountered in an industrial setting.
			CO2	Demonstrate proficiency in using industry-standard tools, technologies, and methodologies relevant to their area of specialization.
			CO3	Apply analytical and problem-solving skills to address challenges encountered during the industrial training
			CO4	Collaborate effectively with team members to achieve project goals and objectives.
			CO5	Manage time and resources efficiently to complete assigned tasks and projects within the stipulated timeframe.
			CO6	Prepare a comprehensive report documenting their experience, including project details, learnings, and reflections.
M.Sc. II	CS-681-RP	Research Work-II	CO1	Independently conduct research in a specific area of computer science
			CO2	Apply appropriate research methodologies to address research problems.
			CO3	Analyze and synthesize information gathered from literature reviews, experiments, or data analysis
			CO4	Develop innovative solutions to research problems within the scope of computer science.
			CO5	Effectively present research findings through written reports, oral presentations, or poster presentations.
			CO6	Publish research work in reputable journals, present at conferences

SEMESTER III				
M.Sc. II (Computer Science)	CSUT231	Software Architecture and Design Patterns	**CO1**	Recognize the characteristics of patterns that make it useful to solve real-world problems.
			CO2	Process available data using python libraries and predict outcomes using Machine Learning algorithms to solve given problem.
			CO3	Able to use specific frameworks as per applications need.
			CO4	To understand about design pattern.
			CO5	Design java application using design pattern techniques.
M.Sc. II (Computer Science)	CSUT232	Machine Learning	**CO1**	Recognize the characteristics of machine learning that make it useful to real-world problems.
			CO2	Process available data using python libraries and predict outcomes using Machine Learning algorithms to solve given problem.
			CO3	Able to estimate Machine Learning models efficiency using suitable metrics..

			CO4	Design application using machine learning techniques.
M.Sc. II (Computer Science)	CSUT233	Web Frameworks	**CO1**	Students will be ready with the technology which is used widely in Industry as a part of full stack developer.
			CO2	Students will know the powerful way to develop the web application in Python
			CO3	Students will understand what really the asynchronous programming.
			CO4	Build and deploy robust Django Web App.
			CO5	Integrate with Restful web services.
M.Sc. II (Computer Science)	CSDT234A	Big Data Analytics	**CO1**	Recognize the characteristics, applications of big data that make it useful to real-world problems. .
			CO2	Process available data using big data tools hadoop file system and predict outcomes to solve given problem.
			CO3	Study & Design various case studies using big data tools/commands and analysis it
M.Sc. II (Computer Science)	CSDP234A	Big Data Analytics Practical	**CO1**	Recognize the characteristics, applications of big data that make it useful to real-world problems. .
			CO2	Process available data using big data tools hadoop file system and predict outcomes to solve given problem.
			CO3	Study & Design various case studies using big data tools/commands and analysis it
M.Sc. II (Computer Science)	CSDT234B	Web Analytics	**CO1**	Understand social media, web and social media analytics, and their potential impact.
			CO2	Determine how to Leverage social media for better services and Understand usability metrics, web and social media metrics.
			CO3	Use various data sources and collect data relating to the metrics and key performance indicators.
			CO4	Identify key performance indicators

				for a given goal, identify data relating to the metrics and key performance indicators.
M.Sc. II (Computer Science)	CSDP234B	Web Analytics Practical	**CO1**	Understand social media, web and social media analytics, and their potential impact.
			CO2	Determine how to Leverage social media for better services and Understand usability metrics, web and social media metrics.
			CO3	Use various data sources and collect data relating to the metrics and key performance indicators.
			CO4	Identify key performance indicators for a given goal; identify data relating to the metrics and key performance indicators
M.Sc. II (Computer Science)	CSDT234C	Project	**CO1**	Students should work in a team of minimum 2 and maximum 3 students.
			CO2	Choose a project topic without any restriction on technology or domain to make them familiar with chosen technology.
			CO3	Group will work independently throughout the project work including: problem identification, information searching, literature study, design and analysis, implementation, testing, and the final reporting.
M.Sc. II (Computer Science)	CSDT234C	Project Related Assignments	**CO1**	Students should work in a team of minimum 2 and maximum 3 students.
			CO2	Choose a project topic without any restriction on technology or domain to make them familiar with chosen technology.
			CO3	Group will work independently throughout the project work including: problem identification, information searching, literature study, design and analysis, implementation, testing, and the final reporting.
M.Sc. II (Computer	CSUP235	Practical on CSUT231,	**CO1**	Able to use specific frameworks as per applications need. .

Science)		CSUT232 and CSUT233	**CO2**	Process available data using python libraries and predict outcomes using Machine Learning algorithms to solve given problem.
			CO3	Able to estimate Machine Learning models efficiency using suitable metrics.
SEMESTER IV				
M.Sc. II (Computer Science)	CSUT241	Industrial Training /Institutional project	**CO1**	Each student must individually complete minimum 5 months full time Industrial training / Institutional project in the 4th semester.
			CO2	To bridge the gap between academic's and industry.
			CO3	To get the exposure of real time working environment.
			CO4	This is chance for students to work on their own choice project, something that interests and inspire to them to make them comfortable for industry point of view

Name of the Programme: B.Sc. Electronics

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
F.Y.B.Sc.	EL- 111	Basics of Applied Electronics	**CO1**	To identify different parameters/functions/specifications of components used in electronic circuits
			CO2	To solve problems based on network theorems.
			CO3	To perform simulations using simulator for analyzing network performance
F.Y.B.Sc.	EL- 112	Electronic Devices and Circuits	**CO1**	To analyze performance parameters based on study of characteristics of electronic devices like diode, transistors etc
			CO2	To choose proper electronic devices as per the need of application
			CO3	To perform simulations for designing and analyzing diode/transistor circuits
			CO4	To build and test the circuitslike street light controller using electronic devices
F.Y.B.Sc.	EL- 113	Electronics Lab IA	**CO1**	To identify different components and devices as well as their types
			CO2	To understand basic parameters associated with each device
			CO3	To know operation of different instruments used in the laboratory
			CO4	To connect circuit and do required performance analysis
			CO5	To compare simulated and actual results of given particular experiment
SEMESTER II				
F.Y.B.Sc.	EL-121	Fundamentals of Digital Electronics	**CO1**	To solve problems based on interconversion of number systems
			CO2	To reduce the expression using Boolean theorems
			CO3	To reduce expressions using K maps in SOP and POS forms
			CO4	To understand how to use flip flops to

				build modulus counter
			CO5	To familiarize with applications of counters like ring counter or event counter
F.Y.B.Sc.	EL- 122	Analog and Digital Device applications	**CO1**	To compare different opamps as per specifications or performance parameters
			CO2	To understand opamp circuits and its usefulness in different applications
			CO3	To know operating principle of IC 555 in different configurations
			CO4	To understand different types of DAC and their performance parameters
			CO5	To study different types of ADC and their performance parameters
F.Y.B.Sc.	EL- 123	Electronics Lab IB	**CO1**	To connect opamp circuits and analyze the output
			CO2	To build application circuits of opamp
			CO3	To design the output frequency of IC 555 as astable/monostable multivibrator
			CO4	To compare simulated and actual results of given circuit
SEMESTER III				
S.Y.B.Sc	EL-231	Communication Electronics	**CO1**	Understand different blocks in communication systems, types of noise in communication systems and its different parameters
			CO2	Understand need of modulation, modulation process and amplitude modulation and demodulation methods
			CO3	Analyse generation of FM Modulation and demodulation methods and comparison between amplitude and frequency modulation
			CO4	Identify different radio receivers and their performance parameters.
			CO5	Solve problems based on AM and FM performance parameters
			CO6	Compare pulse modulation techniques such as PAM, PPM, PWM and

				compare TDM and FDM techniques used in communication
			CO7	Understand need of sampling and sampling theorem as well as know about performance parameters of digital communication
			CO8	Analyze difference between ASK, FSK , PSK as well as PCM and its applications
S.Y.B.Sc	EL-232	Digital Circuit Design	**CO1**	Distinguish between different logic families based on their performance parameters
			CO2	Analyze basic combinational logic circuits for simple applications
			CO3	Design combinational logic circuits using K maps for identified applications
			CO4	Design Sequential logic circuits using state diagram, excitation table for identified applications
			CO5	Understand and compare different types of ADC and their performance parameters using data sheets/manuals
			CO6	Understand and compare different types of DAC and their performance parameters using data sheets/manuals
S.Y.B.Sc	EL-233	Practical Course	**CO1**	Describe and explain the techniques of generation of AM/ FM and demodulation
			CO2	Design FSK generation using standard IC XR 2206 refering data manuals
			CO3	Describe and explain the TDM/ FDM generation technique
			CO4	Demonstrate PPM/PWM/PAM and PCM techniques using standard circuits in data manuals
			CO5	Design and build minimum complexity digital circuits using logic gates
			CO6	Design and analyze different combinational and sequential logic circuits using standard ICs in data manuals

			CO7	Design ADC/ DAC using data manuals and study its performance parameters
SEMESTER IV				
S.Y.B.Sc.	EL-241	Analog Circuit Design	**CO1**	Understand and design push pull amplifier and need of heat sinks
			CO2	Distinguish between Opamp Feedback circuits based on their configurations
			CO3	Analyze the effect of negative and positive feedback on characteristics of Opamp
			CO4	Understand and analyze the need of positive feedback in oscillator circuits
			CO5	Design , develop and build circuits for identified applications
S.Y.B.Sc.	EL-242	Microcontroller and Python Programming	**CO1**	Identify the features and architectural details of microcontroller(arduiono)
			CO2	Write code/program using open source programming language(ardiuno) for basic identified applications
			CO3	Understand programming basics of python programming language
			CO4	Understand special features of python programming language such as importing modules, directory, tupules
			CO5	Design , build and implement applications using ardiuno and python
S.Y.B.Sc.	EL-243	Practical Course	**CO1**	Describe and explain the design procedure of different types of active filters and analyze its frequency response
			CO2	Demonstrate positive feedback for oscillator circuits using standard ICs
			CO3	Describe and explain design procedure for two stage amplifiers and application circuits
			CO4	Design practical circuits for identified applications
			CO5	Develop working setup and write programs using programming techniques of arduino
			CO6	Demonstrate and explain interfacing hardware to arduino microcontroller

Name of the Programme: B.Sc. Geology

Name of the Class	Course Code	Course Title	Course Outcome	
SEMESTER I				
F.Y.B.Sc.	GL 111	Fundamentals of Geology and Understanding the Planet Earth	**CO1**	The study of this paper strengthens student knowledge with respect to understanding the essentials of the structural dynamics of the earth.
			CO2	Students will understand the nomenclature of Earth.
			CO3	Students will able to understand the historical nature of the earth.
			CO4	Students will distinct the various Geological processes that take place on the surface of the Earth.
	GL 112	Mineralogy and Crystallography	**CO1**	Studying the basics of mineralogy and crystallography helps in understanding and building the overall knowledge in Geology.
			CO2	Students will learn the scope and branches of mineralogy, its importance and conservation.
			CO3	Student will learn major elements constituents of minerals, their formation in different environment.
			CO4	Students will be able to identify minerals and ore mineral, and will be able to diagnose the characters of the minerals and its uses.
	GL 113	Practicals related to GL 111 and GL 112	**CO1**	Students will be able to identify different minerals based on their physical properties.
			CO2	Students will be able to identify different minerals based on their Optical properties using Petrological microscope.

			CO3	Student will be able study the Nomenclature of different crystals based on their crystallographic systems of formation.
			CO4	Students will study the concepts of Geological maps, with reference to their Topography, Geology and Geological History.
SEMESTER II				
F.Y.B.Sc	GL 121	Stratigraphy and Sedimentation	**CO1**	The student will learn the Principles of Strtigraphy,development of Stratigraphic concepts and its importance.
			CO2	The student will study the stratigraphic classification, Nomenclature and stratigraphic elements. And methods of collection Stratigraphic data
			CO3	Student will learn the processes of Sedimentation and formation of Sedimentary rocks
			CO4	The student will study the Textures and Structures of the sedimentary rocks and its importance to its environment of formation.
	GL 122	Petrology and Geochemistry	**CO1**	Student will study the definition and characteristics of different rocks.
			CO2	Student will learn the nature, physicochemical composition of the Magma.
			CO3	Student study the process of Crystallization of Magma and the factor controlling crystallization.
			CO4	Student will study the different Textures and Structures of Igneous rocks.
			CO5	Students will study the various theories related to formation of Elements and basic terms of Radioactivity.
			CO6	Student will study the Definition, Agents and types of Metamorphism along with concept of Metamorphic Facies.

			CO7	Student will study the different Textures and Structures of Metamorphic rocks.
	GL 123	Practicals related to GL 121 and GL 122	**CO1**	The student will study the Megascopic and Microscopic properties of Igneous, Sedimentary and Metamorphic rock with their classification.
			CO2	The student will study the primary sedimentary structures and their environmental significance
			CO3	The student will study the Principles of stratigraphic correlation
			CO4	The students will undertake one day geological field work and submit the tour report
SEMESTER III				
S.Y.B.Sc	GL 211	Structural Geology	**CO1**	The students will study the attitude of planar feature and the use of Brunton Compasses, Clinometer Compasses, and GPS.
			CO2	The student will study the factors controlling the rock deformation.
			CO3	The student will study the definition, terms, and the classification of various structural features such as Joints, Fractures, Shear zones, Faults and Folds.
	GL 212	Palaeontology	**CO1**	The Student will study Definition, Branches, Importance and Scope of Paleontology.
			CO2	The Student will study the Definition, modes of Presevation of fossil and techniques used in collection, and illustration of fossils.
			CO3	The study will study the morphology of Hard parts ,Geological and Geographical distribution of Phylla Mollusca, Coelenterate, Echinodermata and Arthopoda
			CO4	The student will student organic evolution.
	GL 213	Practicals related to GL 211 and	**CO1**	The students will study the principles involving solving of

		GL 212		Geological maps.
			CO2	The students will study the Structural Problems involving hill slopes, True thickness, Apparent thickness, Vertical thickness and width of outcrop.
			CO3	The students will study the Structural Problems involving the True dip and Apparent dip.
			CO4	The students will study the Structural Problems involving the three point problems.
			CO5	The students will learn the various Fossils based on their morphology of Hard parts,Geological and Geographical distribution of Phylla Mollusca, Coelenterate, Echinodermata and Arthopoda.
SEMESTER IV				
S.Y.B.Sc	GL-221	Global Tectonics and Geodynamics of the lithosphere	**CO1**	The students will learn Evolution of earth based on Composition, physical properties & characteristics of three spherical zones.
			CO2	The students will study the Structure of the lithosphere.
			CO3	The students will study the Global Tectonics of the earth.
			CO4	The students will study the terminologies associated with Different tectonic settings of the earth.
	GL-222	Environmental Geology and Geogenic disasters	**CO1**	The students will study the Concepts, Objectives, and Scope of Environmental Geology; Physical, Biological, and Socio-geological Environment, Bio-geochemical cycles
			CO2	The students will study Surface and subsurface water resources, Hydrogeologic cycle and sources of water Pollution.
			CO3	The students will study different kind of Pollution; Organic And inorganic, Air Pollution and the remedial measures.

			CO4	The student will study the Definition, Types, Prediction, Natural hazard zones and impact assessment.
			CO5	The students will study the Geogenic Disaster such as Volcanoes, Cyclones, Floods and Landslides.
	GL-223	Practicals related to GL 221 and 222	**CO1**	The students will study Marking of Craton/ Mobile belts/ Platforms/ Sedimentary Basins.
			CO2	The students will solve problems related to P and S waves (Interior of the Earth) and Geotherm/Isostacy.
			CO3	The students will solve Problems related to Water Quality index, Air Quality Analysis, Slope stability analysis.
			CO4	The students will undertake a one day geological field work and submit the tour report
SEMESTER V				
T.Y.B.Sc	GL 311	Geology of India – I	**CO1**	The students will learn the Indian sub-continent exposes a wide range of lithologies that span from 3.6 billion years to present.
			CO2	The students will learn the Geology of India is synonymous with the geology of the world and its ancient rock types from the Indian Peninsula,
			CO3	The students will learn the Cretaceous Deccan volcanism and Tethyian sediments exposed in the mighty Himalayas is noteworthy.
			CO4	The student will gain the knowledge about the stratigraphy and geology of India with emphasis on the Stratigraphy of India with respect to Paleozoic, Mesozoic and Cenozoic Era which will help in understanding the different episodes on the earth during the geologic past.
			CO5	The students will learn the State related Geology: The Geology and Stratigraphy of Maharashtra
	GL 312	Mineral	**CO1**	The students will learn essential and basic concepts of mineral

		Resources		expiration techniques and the art and science of mining mineral resources.
			CO2	The students will learn Primary processes of formation of Mineral Deposits
			CO3	The students will learn Secondary processes of formation of mineral deposits
			CO4	The students will learn metallic deposits with reference to mineralogy, properties, uses & their geological & geographical distribution
			CO5	The students will learn non-metallic deposits with reference to mineralogy, properties, uses & their geological & geographical distribution
			CO6	The students will learn Geophysical and Geochemical methods for mineral exploration
			CO7	The students will learn Environmental and social issues related to mineral resource extraction
	GL 313	Marine Geology	**CO1**	A student will understand and learn about the basic concepts of oceanography and marine geology with respect to geology as to enable them to work as a marine researcher.
			CO2	The students will learn applications of Geophysical Techniques for Exploration of the Sea Floor
			CO3	The students will learn about an Exclusive economic zone (EEZ) and their economic potential
			CO4	The students will learn Origin, structure and evolution of Indian Ocean shelf and margins
			CO5	The students will learn Marine Environmental Problems Associated with Non-Petroleum

	GL 314	Engineering Geology	**CO1**	The student will become aware of the importance of geological studies and its applicability to various engineering problems.
			CO2	The students will learn Engineering Properties of Construction Material
			CO3	The students will learn Site investigations for dam,tunnel,roads and bridges
	GL 315	Hydrogeology	**CO1**	The students will learn basic concepts in Hydrogeology
			CO2	The students will learn field and laboratory methods used to characterize aquifer properties and hydrogeology of rocks
			CO3	The students will learn Groundwater chemistry, Groundwater Resources of India.
			CO4	The students will learn Groundwater quality hotspots in India
			CO5	The student will understand the hydrogeological concepts, exploration, exploitation and recharge of groundwater and methods of monitoring groundwater quality and sources of pollution
	GL 316	Applied Geophysics	**CO1**	This course deals with methodologies for extracting ecological information out of geophysical datasets generated from different petrophysical properties.
			CO2	The student will learn Geophysical Methods like Gravity Method, Magnetic Method, Seismic Method
			CO3	The student will learn Geophysical Methods like Electrical Method, Resistivity Method, Self-potential Method, Induced polarization Method and Electromagnetic Method
			CO4	In Geophysical exploration the student will gain first-hand knowledge dealing with the principles and their significance
	SEC-I	Geotechnology	**CO1**	The student will learn about the concepts, methods and hands on

				determination of soil and rock properties which will strength their knowledge of Engineering Geology.
			CO2	The student will learn about the basic knowledge of surveying techniques.
			CO3	The student will learn about the Geotechnical Studies related to Drilling in geotechnical field and Drilling Equipments
			CO4	The student will learn about the Laboratory and Field Geotechnical Tests
			CO5	The student will learn about the Surveying and Levelling related to definitions of Surveying and Levelling and Objectives of Survey
	SEC-II	Gemmology and Gem Testing	**CO1**	The student will learn about the Gemmology- Basic properties of gems- Formation of gem stones
			CO2	The student will learn Uses of Gem Testing Instruments,
			CO3	The student will learn the causes of colours in gem stones and treatments of gem stones and their detection
			CO4	The student will learn Measurement of refractive indices and birefringence tests using a gem-testing Refractometer).
			CO5	The student will learn the basic idea is to make students well versed with the different terminologies used in the gem industry and to provide skills to become a successful gemmologist
	GL 317	Practicals related to GL 311 and GL 312	**CO1**	The student will learn typical hand specimens of rocks from different lithological units of Pre Cambrians of India.
			CO2	The student will learn paleogeographical maps of different periods of Pre Cambrians of India.
			CO3	The student will learn geological maps of different units of Pre Cambrians of India and Interpretation of regional geological maps.
			CO4	The student will learn ore minerals in hand specimen and

				industrial minerals in hand specimen
			CO5	The student will learn preparation of mineral maps of India showing occurrences of Ore and industrial minerals.
			CO6	The student will learn Mineralogical & textural study of common Ore minerals/industrial minerals under microscope.
	GL 318	Practicals related to GL 313 and GL 314	**CO1**	The students will study rocks of ocean floor and Plotting of distribution of major bathymetric and tectonic features in the global oceans
			CO2	The students will study authigenic sediments and Distribution and plotting of carbonate and siliceous oozes, glacio-marine, pelagic clay and volcanogenic sediments in global oceans
			CO3	The students will study Preparation of section along mentioned directions and interpretation for construction of dam, tunnel and bridge
			CO4	The students will study of physical and engineering properties of aggregates and building stone
	GL 319	Practicals related to GL 315 and GL 316	**CO1**	The student will have gained an understanding of hydrogeological concepts, exploration, exploitation and recharge of groundwater and methods of monitoring groundwater quality and sources of pollution
			CO2	The students will study preparation and interpretations of hydrographs from given water level data and water table contour maps from given water level data.
			CO3	The students will study estimation of aquifer properties as porosity and permeability, hydraulic conductivity. Storage coefficient and Transmissivity.
			CO4	The students will study of patterns of geophysical responses from various geological mediums.
			CO5	The students will study maps related to Gravity and Magnetic anomalies and Interpretation of Seismic Data
			CO6	The students will study plotting and interpretation of resistivity

				data as well as Analysis of self-potential data.
SEMESTER VI				
T.Y.B.Sc	GL 321	Geology of India – II	**CO1**	The students will study the students will study Stratigraphic Boundaries in India –Archean- Proterozoic, Precambrian-Cambrian, Permo- Triassic, K-T
			CO2	The students will study Geological systems with reference to their type area, broad lithology, fossils content Cambrian, Ordovician, Silurian, Devonian, Carboniferous, Permian, Triassic,Jurassic, Cretaceous & Tertiary
			CO3	The students will study brief account of their distribution, Geographical location, classification lithological succession, structure and economic importance, with a broad range stratigraphic correlation- Palaeozoic Era
			CO4	The students will study in brief account of their distribution, Geographical location, classification lithological succession, structure and economic importance, with a broad range stratigraphic correlation- Mesozoic and Cenozoic Era
			CO5	The students will study physiographic divisions and tectono-magmatic evolution, Stratigraphy and tectonics of the Siwaliks. ,Karewas of Kashmir and the Trans-Himalayan and Karakoram Granite Batholith
			CO6	The students will study State related Geology: The Geology and Stratigraphy of Maharashtra
	GL 322	Mining and Mineral Exploration	**CO1**	The students will study Geology in mining industry,
			CO2	The students will study Mineral exploration, Surface and sub-surface exploration methods. prospecting for economic minerals – drilling, sampling and assaying, Geophysical techniques Geomorphological and remote sensing techniques, Geobotanical and geochemical methods
			CO3	The students will study types of mining-Surface and

				underground mining, Equipment and accessories for mining, Calculation of Specific gravity, Porosity, Bulk density, compression factor
			CO4	The students will study sampling Principle, Methods, Size and quantity, Reduction, Errors, Sampling practices in open-cast mining
			CO5	The students will study types of Open cast mining, Underground mining, Coal mining methods Factors influencing choice of mining method
			CO6	The students will study Mining Acts and Regulations in India and Conservation of mineral resources
	GL 323	Oceanography	**CO1**	A student will understand and learn about the basic concepts of oceanography with respect to geology as to enable them to work as an oceanographer.
			CO2	The students will study Physical oceanography
			CO3	The students will study Ocean currents-, Origin of surface currents, Main Components of Ocean Surface Circulation, Indian Ocean Circulation
			CO4	The students will study El-Nino effect relation between climate and ocean in the Indian context
			CO5	The students will study Sea level changes -Processes Affecting Sea Level, Past Sea Level Changes & Effects
			CO6	The students will study Coastal Regulatory Zones - Classification & Prohibited activities within CRZ & Regulation of permissible activities in CRZ
	GL 324	Petroleum Geology	**CO1**	A student will understand and learn about the basic concepts of Petroleum Geology with respect to geology as to enable them to work as a Petroleum Geologist.
			CO2	The students will learn Origin of petroleum, Kerogen: Source

				Material and Formation, Composition and Distribution Petroleum Chemical composition and physical properties of crudes oil
			CO3	The students will learn Reservoir fluids: Water, oil and gas, origin, migration and accumulation of oil and natural gas
			CO4	The students will learn Reservoir and Traps
			CO5	The students will learn Petroliferous Basins of World
			CO6	The students will study Petroliferous Basins of India, Bombay basin; Krishna-Godavari basin; Assam basin; Cauvery basin and Rajasthan basin
	GL 325	Climate Change: Past, Present and Future	**CO1**	The students will learn the Earth's climate system and explores the science of global climate change using different proxies.
			CO2	The students will learn composition and structure of the atmosphere, Study climate change models
			CO3	The students will learn the factors affecting the earth's climate will be examined, along with anthropogenic impacts both globally and regionally
			CO4	The students will learn Effects on climate change, Greenhouse gases, El Nino and Ocean circulation
			CO5	The students will learn the changes in rainfall patterns/intensity vis-à-v is storm surges, cyclone, floods, droughts
			CO6	The students will learn the evolution of Indian monsoon system through the geological time, agro-climatic divisions of Indian subcontinent, climate and landscape evolution, Use of climate proxies to model and motor past and present climate indicators
	GL 326	Geological Field Methods and Mapping	**CO1**	This course is devised to provide basic knowledge of geological mapping and surveying techniques. It also will upgrade and relate the theoretical knowledge of geological aspects to field observations.

			CO2	The students will learn Introduction to the study of geological field methods and mapping, use and applications of Brunton, Clinometer Compass and GPS in fieldwork
			CO3	The students will learn Reconnaissance study of areas having igneous and metamorphic and sedimentary rocks, Locating oneself on topographic map, Identification, discrimination and tracing of different type of contacts, Geological mapping of a small area, collection, identification and labelling of rock and mineral specimens.
			CO4	The students will learn Students will make geological observations in the field, record data in field notes, and prepare geological maps, field safety, Logistics and Navigation
			CO5	The students will learn Toposheet reading of toposheet with reference to toposheet number, latitude, longitude, state, district, scale, adjacent toposheet numbers and conventional signs. Orientation of Topographic sheet in field; marking location in toposheet; Bearing
			CO6	The students will learn the Interpretation of geological data and maps, and communicating geological information:
	SEC-III	Applications of Remote Sensing in Geosciences	**CO1**	The student will be appraised with all the theoretical knowledge, information and skills to use Remotely Sensed data for geological applications.
			CO2	The students will learn different types of Remote sensing Systems (Active & Passive), Elements of passive Remote sensing system.
			CO3	The students will learn Energy source and radiation principles (EM wave, Wave theory, EM spectrum, particle theory, Stefan-Boltzman's law, Emissivity, Black, white & grey bodies)
			CO4	The students will learn Energy interactions in the atmosphere (Scattering, absorption, atmospheric windows & related sensing systems); Energy interactions with the earth (principles of the Conservation of energy, specular & diffused reflectors), Spectral

				reflectance of vegetation, soil & water; Data acquisition & interpretation.
			CO5	The students will learn aerial photography-classification of aerial photographs on the basis of Camera axis,Film and filter combination, lens -system, types of cameras, high and low sun angle photography, digital cameras, Planning of Aerial photography-Time of photography, Geometric characteristics of Aerial photos, Mirror and pocket stereoscopes.
			CO6	The students will learn Photo Recognition Elements, Photo-geological interpretations, Introduction to Satellites, Sensors &their applications, Scanners, Image characteristics & Spectral responses of various features, Applications of Remote sensing
	SEC-IV	Oil Field Services	**CO1**	The students will learn Types oil wells and geotechnical order Methods of Oil well drilling: Cable tool drilling and rotary drilling
			CO2	The students will learn Components of rotary drilling system Monitoring of drilling process Concept of Subsurface pressure
			CO3	The students will learn Types of Drilling Rigs, Controlled Directional Rotary Drilling and Horizontal Drilling, Drilling Mud
			CO4	The students will learn Formation Evaluation, : Wire line logs, Basic Principles , tools of SP, gamma ray, Neutron, Density, Caliper, Dipmeter, Temperature and Sonic Logs and their interpretation
			CO5	The students will learn Mud logging: Principle, techniques and tools of mud logging. Interpretation of gas, drilling and mud parameters.
			CO6	The students will learn MWD(Measurement While Drilling)/LWD (Logging While Drilling) . Principle and tools of MWD/LWD, data analysis and interpretation,
	GL 327	Practicals related	**CO1**	The students will learn typical hand specimens of rocks from

		to GL 321 and GL 322		different lithological units of Phanerozoic of India. Gondwana Supergroup, Jurassics of Kachchh and Rajasthan, Cretaceous of Narmada Valley/Bagh beds, Cretaceous of Tamil Nadu and Meghalaya, Deccan Volcanic province, Tertiary and Quaternary formations of India
			CO2	The students will learn Study of paleogeographical maps of different periods of Phanerozoic of India.
			CO3	The students will learn Geological maps of different units of Phanerozoic of India, Interpretation of regional geological maps, learn Gondwana flora
			CO4	The students will learn Calculation of Specific gravity, Porosity, Bulk density, averages of assay values
			CO5	The students will Correlation of subsurface data from different logs and Calculation of ore reserves from the given map data.
	GL 328	Practicals related to GL 323 and GL 324	**CO1**	The students will learn reading coastal toposheets, hydrographic sheets and ocean floor topography and Preparing bathymetric cross-sections using hydrographic sheets
			CO2	The students will learn Assigning different kinds of marine sediments to different bathymetric settings, Study of important global surface and deep-water currents, with special emphasis on the 'Conveyor Belt'
			CO3	The students will learn Distribution of Global Pressure beltsand Determination of porosity and permeability by crude method / core samples
			CO4	The students will learn Numerical problems based on porosity and permeability and Study of Isopach maps
			CO5	The students will learn Panel / Fence diagrams and Categorization of Petroliferous basins of India
			CO6	A student will understand and learn about the basic concepts of Petrology Geology with respect to geology as to enable them to work as a Petroleum Geologist.
	GL 329	Practicals related	**CO1**	The course introduces the students to the Earth's climate

		to GL 325 and GL 326		system and explores the science of global climate change using different proxies.
			CO2	This course is devised to provide basic knowledge of geological mapping and surveying techniques.
			CO3	The students will learn Preparation and interpretations of Isotherm and Isobar on map. Distribution of major wind patterns on World map.
			CO4	The students will learn Preparation of paleogeographic maps (distribution of land and sea) of India during specific geological time intervals
			CO5	The students will learn Numerical exercises on interpretation of proxy records for paleoclimate and show ocean current on world map
			CO6	The students will learn Plane table chain survey and Magnetic compass survey or GPS survey. Stereographic Problems involving two intersecting planar features
			CO7	The students will learn field work for about ten days in an area of geological interest anywhere in India. Systematic collection of geological samples, data collection & preparation of geological field report.

Name of the Programme: B.Sc. Mathematics

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
F.Y.B.Sc.	MT-111	Algebra	**CO1**	Student should study sets, relations and functions as revision.
			CO2	Student should be able to calculate G.C.D and L.C.M using divisibility of integers and its properties.
			CO3	Student should know fundamental theorem of arithmetic, prime numbers, theory of congruences with properties and their applications in Fermat's theorem and Euclid's theorem.
			CO4	Student should know basic algebraic properties, modulus, conjugates, roots and nth roots of unity of complex numbers and application of De Moiver's theorem.
F.Y.B.Sc.	MT-112	Calculus – I	**CO1**	Student should study various properties of real numbers and its consequences.
			CO2	Student should know sequences and limits, convergence, boundedness of sequences with their theorems and examples.
			CO3	Student should know limits of functions with example, limit theorems with extension of limit concepts.
			CO4	Student should know continuous function, continuous function on intervals with various theorems and examples.
F.Y.B.Sc.	MT-113	Mathematics Practical	**CO1**	Student gains confidence in solving the problems.
			CO2	Using Maxima software student should study convergence and divergence of sequences, limits at infinity, graphical pictures of various curves and surfaces.
SEMESTER II				
F.Y.B.Sc.	MT-121	Analytical Geometry	**CO1**	Student should know the significance of second-degree equation in x and y so as to classify the nature of graph in two-dimension.
			CO2	Student should know various forms of planes and their equations of first degree in three variables.

			CO3	Student should be familiar with symmetrical and asymmetrical form of lines in 3-D obtain by intersection of two planes.
			CO4	Student should know various forms of sphere and significant points of equation of sphere.
F.Y.B.Sc.	MT-122	Calculus – II	**CO1**	Student should be familiar to obtain the derivative of different functions.
			CO2	Student can study different functions by converting them into simple series (Taylor & Maclaurin series).
			CO3	Student should know the techniques of solving the differential equations.
			CO4	Students should able to solve various real life problems using knowledge of differential equation.
F.Y.B.Sc.	MT-123	Mathematics Practical	**CO1**	Student gains confidence in solving the problems.
			CO2	Using Maxima software student should study convergence and divergence of sequences, limits at infinity, graphical pictures of various curves and surfaces.
SEMESTER III				
S.Y.B.Sc.	MT-231	Calculus of Several Variables	**CO1**	The student should know partial derivatives and differentiability with higher order with applications.
			CO2	Using the derivative test student should be able to find extreme values of various functions.
			CO3	The student should develop the skill of solving multiple integrals and their applications.
S.Y.B.Sc.	MT-232 (A)	Numerical Methods & its applications	**CO1**	Student should able to solve algebraic and transcendal equations by using different numerical methods.
			CO2	Student should able to know different interpolation formulae and apply them to interpolate the given data.
			CO3	Student should able to differentiate and integrate by different numerical methods.
			CO4	Student should able to solve ODE by various numerical methods.
S.Y.B.Sc.	MT-232 (B)	Graph Theory	**CO1**	A students should be able to work with graphs and identify certain parameters and properties of the given graphs
			CO2	Student should know connected graph with its properties.
			CO3	Student should able to apply various algorithm

				to find Euler and Hamiltonian path.
			CO4	Student should able to study trees with its properties and application.
S.Y.B.Sc.	MT-233	Mathematics Practical based on MT-231 & MT-232	**CO1**	The student develops theoretical, applied and computational skills.
			CO2	The student gains confidence in proving theorems and solving problems.
			CO3	Student should able to plot 2D and 3D curves using Maxima software.
SEMESTER IV				
S.Y.B.Sc.	MT-241	Linear Algebra	**CO1**	Student should be familiar with matrices and its application to solve the system of linear equation.
			CO2	The student should be able to identify a set as a vector space and to find dimension, row space, column space, null space, rank and nullity.
			CO3	Student should be able to study various vector spaces using linear transformation.
S.Y.B.Sc.	MT-242(A)	Vector Calculus	**CO1**	Student should be familiar with gradient, divergence and curl of the functions.
			CO2	Using gradient student can find tangent, plane and normal line to the surface.
			CO3	Student should be familiar to solve line, surface and volume integrals so as to solve many real-life problems.
S.Y.B.Sc.	MT-242(B)	Dynamical System	**CO1**	Student should be able to evaluate eigen values and eigen vectors of the matrix.
			CO2	Student should be able to solve first order equations and apply it in logistic population model.
			CO3	Student should be able to calculate real, complex, distinct and repeated eigen values
			CO4	Student should classify planner system and exponential of a matrix.
S.Y.B.Sc.	MT-243	Mathematics Practical based on MT-241 & MT-242	**CO1**	The student develops theoretical, applied and computational skills.
			CO2	The student gains confidence in proving theorems and solving problems of linear algebra, vector calculus and Dynamical System.
			CO3	Student should be able to solve various problems of linear algebra, vector calculus and Dynamical System using maxima software.
SEMESTER V				

T.Y.B.Sc.	DSE-1A: MT- 351	Matric Spaces	**CO1**	Understand the introductory concepts of metric spaces
			CO2	Correlate these concepts to their counter parts in modern analysis by studying examples
			CO3	Learn to analyze mappings between spaces
			CO4	Attain background for advanced courses in real analysis, functional analysis, and topology
			CO5	Appreciate the abstractness of the concepts such as open balls, closed balls, compactness, connectedness etc. beyond their geometrical imaginations
T.Y.B.Sc.	DSE-1B: MT 352	Real Analysis-I	**CO1**	Learn the basic facts in logic and set theory
			CO2	Learn to define sequence in terms of functions from N to a subset of R and to understand several properties of the real line.
			CO3	Recognize bounded, convergent, divergent, Cauchy and monotonic sequences and to calculate their limit superior, limit inferior, and the limit of a bounded sequence.
			CO4	Use the ratio, root, alternating series and limit comparison tests for convergence and absolute convergence of an infinite series of real numbers.
T.Y.B.Sc.	DSE-2A: MT 353	Group Theory	**CO1**	Recognize the mathematical objects that are groups, and classify them as abelian, cyclic and permutation groups, etc.
			CO2	Analyze consequences of Lagrange's theorem
			CO3	Learn about structure preserving maps between groups and their consequences.
			CO4	Explain the significance of the notion of cosets, normal subgroups, and factor groups.
T.Y.B.Sc.	DSE-1B: MT 354	Ordinary Differential Equations	**CO1**	Understand the genesis of ordinary differential equations.
			CO2	Learn various techniques of getting exact solutions of solvable first order differential equations and linear differential equations of higher order.
			CO3	Grasp the concept of a general solution of a linear differential equation of an arbitrary order and also learn a few methods to obtain the general solution of such equations.
T.Y.B.Sc.	MT 355(A) DSE-3A	Operations Research	**CO1**	Analyze and solve linear programming models of real-life situations.
			CO2	The graphical solution of LPP with only two

				variables, and illustrate the concept of convex set and extreme points. The theory of the simplex method is developed.
			CO3	The relationships between the primal and dual problems and their solutions with applications to transportation, assignment and two-person zero-sum game problem.
T.Y.B.Sc.	MT 356(B) DSE-3B	Number Theory	**CO1**	This course will enable the students to learn some of the open problems related to prime numbers.
			CO2	This course will enable the students to learn about number theoretic functions and modular arithmetic.
			CO3	The Law of Quadratic Reciprocity and other methods to classify numbers as primitive roots, quadratic residues, and quadratic non-residues.
T.Y.B.Sc.	DSE-1: MT357	Practical Course Lab-1 (on Metric Space and Real Analysis-I)	**CO1**	To develop the skill of solving the problems on metric spaces using theorems.
			CO2	To develop the skill of solving the problems on convergent, divergent, bounded, limit superior and limit inferior.
			CO3	To identify the convergence and divergence of series by applying various test.
T.Y.B.Sc.	DSE-2: MT 358	Practical Course Lab-II (on Group Theory and Ordinary Differential equations)	**CO1**	To develop the skill to classify various sets on the basis of groups and its properties.
			CO2	To develop the skill of prove the theorems and properties of various types of groups and subgroup.
			CO3	To develop the skill of problem solving of various differential equation by applying theorems.
T.Y.B.Sc.	DSE-3: MT 359	Practical Course Lab-III (on DSE-3A and DSE-3B)	**CO1**	Analyze and solve linear programming models of real-life situations.
			CO2	To develop the concept of formulate the real-life problem into LPP.
			CO3	This course will enable the students to solve some of the open problems related to prime numbers.
			CO4	This course will enable the students to solve the various examples about number theoretic functions and modular arithmetic.

T.Y.B.Sc.	SEC-1: MT - 3510	Programming in Python –I	**CO1**	The student will be able to explain basic principles of Python programming language.
			CO2	The student will implement object-oriented concepts
T.Y.B.Sc.	SEC-2: MT-3511	LaTeX for Scientific Writing	**CO1**	Write a simple LaTeX input document based on the article class.
			CO2	Turn the input document into pdf with the pdf latex program.
			CO3	Format Words, Lines, and Paragraphs.
			CO4	Understand how to present data using tables.
SEMESTER VI				
T.Y.B.Sc.	DSE-4A: MT 361	Complex Analysis	**CO1**	Understand the significance of differentiability of complex functions leading to the understanding of Cauchy-Riemann equations.
			CO2	Evaluate the contour integrals and understand the role of Cauchy-Goursat theorem and the Cauchy integral formula.
			CO3	Expand some simple functions as their Taylor and Laurent series, classify the nature of singularities, find residues and apply Cauchy Residue theorem to evaluate integrals.
			CO4	Represent functions as Taylor, power and Laurent series, classify singularities and poles, find residues and evaluate complex integrals using the residue theorem.
T.Y.B.Sc.	DSE-4B: MT 362	Real Analysis-II	**CO1**	The course will enable the students to learn about some of the families and properties of Riemann integrable functions, and the applications of the fundamental theorems of integration.
			CO2	The course will enable the students to learn about beta and gamma functions and their properties.
			CO3	The course will enable the students to learn about recognize the difference between pointwise and uniform convergence of a sequence of functions.
			CO4	Illustrate the effect of uniform convergence on the limit function with respect to continuity, differentiability, and integrability

T.Y.B.Sc.	DSE-5A: MT 363	Ring Theory	**CO1**	The fundamental concept of Rings, Fields, subrings, integral domains and the corresponding morphisms.
			CO2	Learn in detail about polynomial rings, fundamental properties of finite field extensions, and classification of finite fields.
			CO3	Appreciate the significance of unique factorization in rings and integral domains.
T.Y.B.Sc.	DSE-5B: MT 364	Partial Differential Equations	**CO1**	Formulate, classify and transform partial differential equations into canonical form.
			CO2	Solve linear partial differential equations using various methods and apply these methods in solving some physical problems.
			CO3	Solve Laplace equations using various analytical methods demonstrate uniqueness of solutions of certain kinds of these equations.
T.Y.B.Sc.	DSE-6A: MT 365(A)	Optimization Techniques	**CO1**	Understand fundamentals of Network Analysis using CPM and PERT.
			CO2	Solve a sequencing Problem for various jobs and machines.
T.Y.B.Sc.	DSE-6B: MT 366(B)	Computational Geometry	**CO1**	The course will enable the students to construct algorithms for simple geometrical problems.
			CO2	Characterize invariance properties of Euclidean geometry by groups of transformations.
			CO3	Describe and construct basic geometric shapes and concepts by computational means
T.Y.B.Sc.	MT 367 DSE-4	Practical Course Lab-1 (on Complex Analysis and Real Analysis-II)	**CO1**	To develop the skill of solving the problems on complex analysis using theorems.
			CO2	To develop the skill of solving the problems on Reimann integrable functions.
			CO3	Able to solve various examples on pointwise and uniform convergence.
T.Y.B.Sc.	MT 368 DSE-5	Practical Course Lab-II (on Ring Theory and Partial Differential Equations)	**CO1**	To develop the skill to classify various sets as ring, subring, field, integral domain etc.
			CO2	To classify the examples as PID, UFD, FD etc. using properties and theorems.
			CO3	To develop the skill of problem solving of various partial differential equation by applying theorems.
T.Y.B.Sc.	MT 369 DSE-6	Practical Course Lab-III (on DSE-6A and DSE-6B)	**CO1**	To develop the skill of drawing network diagram of project using PERT and CPM.
			CO2	To develop the skill of assigning the jobs in optimal sequence.

			CO3	To decide the feasible time of replacement of machines.
			CO4	Student should able to transform two dimensional and three-dimensional objects by using different specified transformation matrix.
			CO5	Student should know and apply in real-life different types of 3-D projection.
T.Y.B.Sc	SEC-III: MT 3610	Programming in Python-II	**CO1**	Demonstrate the use of Python in Mathematics such as operations research and computational Geometry etc.
			CO2	Study graphics and design and implement a program to solve a real-world problem.
			CO3	The students will implement the concepts of data with python and database connectivity.
T.Y.B.Sc.	SEC-IV: MT 3611	Mathematics into LaTeX	**CO1**	The student will be able to typeset mathematical formulas, use nested list, tabular and array environments.
			CO2	Import figures and pictures that are stored in external files

Name of the Programme: B.Sc. Physics

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
F.Y.B.Sc.	PHY-111	Mechanics and Properties of Matter	**CO1**	The student will be able to understand Newton's laws and apply them in calculations of the motion of simple systems.
			CO2	The student will be able to understand the concepts of energy, work, power and conservation of energy.
			CO3	The student will be able to understand the concepts of elasticity.
			CO4	The student will be able to understand the concepts of surface tension and viscosity and be able to perform calculations using them.
			CO5	The student will be able to use Bernoulli's theorem in real life problems
F.Y.B.Sc.	PHY-112	Physics Principles and Applications	**CO1**	The students will be able to understand the general structure of atom, spectrum of hydrogen atom.
			CO2	The students will be able to understand the atomic excitation and LASER principles.
			CO3	The learners will understand the bonding mechanism and its different types.
			CO4	The learner will understand the types and sources of electromagnetic waves and applications.
			CO5	Quantitative problem solving skills will be developed.
F.Y.B.Sc.	PHY-113	Physics Laboratory-1A	**CO1**	The students will be able to use various instruments and equipment.

			CO2	The students will be able to design experiments to test a hypothesis and/or determine the value of an unknown quantity.
			CO3	The students will be able to investigate the theoretical background of an experiment.
			CO4	The students will be able to setup experimental equipment to implement an experimental approach.
			CO5	The students will be able to analyze the data, plot appropriate graphs and reach conclusions from data analysis.
			CO6	The students will be able to work in a group to plan, implement and report on a project/experiment.
			CO7	The students will be able to keep a well-maintained and instructive laboratory logbook.
SEMESTER II				
F.Y.B.Sc.	PHY-121	Heat and Thermodynamics	**CO1**	The learner will understand the properties of and relationships between the thermodynamic properties of a substance.
			CO2	The students will understand the ideal gas equation and its limitations and the real gas equation.
			CO3	The students will be able to analyse the heat engines and calculate thermal efficiency.
			CO4	The students will be able to analyze the refrigerators, heat pumps and calculate coefficient ofperformance.
			CO5	The students will be able to understand the types of thermometers and their usage.
F.Y.B.Sc.	PHY-122	Electricity and Magnetism	**CO1**	The students will be able to understand the concept of the electric force, electric field and electric potential for stationary charges.
			CO2	The students will be able to calculate electrostatic field and potential of charge distributions using Coulomb's law and Gauss's law.

			CO3	The students will be able to understand the dielectric phenomenon and effect of electric field on dielectric.
			CO4	The learners will be able to understand magnetic field for steady currents using Biot-Savart and Ampere's Circuital laws.
			CO5	Quantitative problem solving skills will be developed.
F.Y.B.Sc.	PHY-123	Physics Laboratory-1B	**CO1**	The students will be able to use various instruments and equipment.
			CO2	The students will be able to design experiments to test a hypothesis and/or determine the value of an unknown quantity.
			CO3	The students will be able to investigate the theoretical background of an experiment.
			CO4	The students will be able to setup experimental equipment to implement an experimental approach.
			CO5	The students will be able to analyze the data, plot appropriate graphs and reach conclusions from data analysis.
			CO6	The students will be able to work in a group to plan, implement and report on a project/experiment.
			CO7	The students will be able to keep a well-maintained and instructive laboratory logbook.
SEMESTER III				
S.Y.B.Sc.	PHY-231	Mathematical Methods in Physics-I	**CO1**	The learners will be able to understand the complex algebra useful in physics courses
			CO2	The students will be able to understand the concept of partial differentiation.
			CO3	The learners will be able to understand the role of partial differential equations in physics.
			CO4	The learners will be able to understand vector algebra useful in mathematics and physics

			CO5	The students will be able to understand the concept of singular points of differential equations
S.Y.B.Sc.	PHY-232	Electronics	**CO1**	The students will be able to apply different theorems and laws to electrical circuits.
			CO2	The learners will be able to understand the relations in electricity.
			CO3	The students will be able to understand the parameters, characteristics and working of transistors
S.Y.B.Sc	PHY-232	Instrumentation	**CO1**	The learners will be able to understand the concept of measurement.
			CO2	The students will be able to understand the performance of measuring instruments.
			CO3	The learners will be able to design experiments using sensors.
S.Y.B.Sc.	PHY-233	Physics Laboratory-2A	**CO1**	The students will be able to use various instruments and equipment.
			CO2	The students will be able to design experiments to test a hypothesis and/or determine the value of an unknown quantity.
			CO3	The students will be able to investigate the theoretical background of an experiment.
			CO4	The students will be able to setup experimental equipment to implement an experimental approach.
			CO5	The students will be able to analyze the data, plot appropriate graphs and reach conclusions from data analysis.
			CO6	The students will be able to work in a group to plan, implement and report on a project/experiment.
			CO7	The students will be able to keep a well-maintained and instructive laboratory logbook.
SEMESTER IV				
S.Y.B.Sc.	PHY-241	Oscillations, Waves, and Sound	**CO1**	The learners will be able to study underlying principles of oscillations

				and it's scope in development.
			CO2	The students will be able to understand and solve the equations / graphical representations of motion for simple harmonic, damped, forced oscillators and waves.
			CO3	The learners will be able to explain oscillations in terms of energy exchange with various practical applications.
			CO4	The learners will be able to solve numerical problems related to undamped, damped, forced oscillations and superposition of oscillations.
S.Y.B.Sc.	PHY-242	Optics	**CO1**	The students will be able to acquire the basic concept of wave optics.
			CO2	The learners will be able to describe how light can constructively and destructively interfere.
			CO3	The students will be able to explain why a light beam spread out after passing through an aperture
S.Y.B.Sc.	PHY-243	Physics Laboratory-2B	**CO1**	The students will be able to use various instruments and equipment.
			CO2	The students will be able to design experiments to test a hypothesis and/or determine the value of an unknown quantity.
			CO3	The students will be able to investigate the theoretical background of an experiment.
			CO4	The students will be able to setup experimental equipment to implement an experimental approach.
			CO5	The students will be able to analyze the data, plot appropriate graphs and reach conclusions from data analysis.
			CO6	The students will be able to work in a group to plan, implement and report on a project/experiment.
			CO7	The students will be able to keep a well-maintained and instructive laboratory logbook.
SEMESTER V				

T.Y.B.Sc.	PHY-351	Mathematical Methods in Physics-II	**CO1**	The students will be able to understand the basic concepts in different co-ordinate systems.
			CO2	The students will be able to use different mathematical methods to solve differential equations related to Physics problems.
			CO3	The students will be able to understand the basic concepts related to special theory of relativity.
			CO4	Quantitative problem solving skills will be developed.
T.Y.B.Sc.	PHY-352	Electrodynamics	**CO1**	The students will be able to understand the concepts of electrostatics and magnetostatics.
			CO2	The students will be able to understand the basics of electrodynamics.
			CO3	The students will be able to understand the production and propagation of electromagnetic waves.
			CO4	Quantitative problem solving skills will be developed.
T.Y.B.Sc.	PHY-353	Classical Mechanics	**CO1**	The students will be able to understand the basic concepts in Classical Mechanics.
			CO2	The students will be able to understand the comprehensive idea on the Lagrangian and Hamiltonian formulation.
			CO3	The students will be able to understand the dynamics of scattering process and planetary motion.
			CO4	Quantitative problem solving skills will be developed.
T.Y.B.Sc.	PHY-354	Atomic and Molecular Physics	**CO1**	The students will be able to understand the origin of atomic and molecular spectra.
			CO2	The students will be able to understand the basic concepts and use of different spectroscopy.
			CO3	The students will be able to understand the differences among

				different spectroscopic techniques.
			CO4	Quantitative problem solving skills will be developed.
T.Y.B.Sc.	PHY-355	Computational Physics	**CO1**	The students will be able to develop the flowchart and algorithm related to a problem.
			CO2	The students will be able to understand the basic concepts and syntax of C programming.
			CO3	The students will be able to use different numerical methods used to solve Physics problems.
			CO4	Object oriented problem solving skills will be developed.
T.Y.B.Sc.	PHY-356(B)	Elements of Materials Science	**CO1**	The students will be able to understand various methods involved in material synthesis and characterization.
			CO2	The students will be able to understand the importance of use of different instruments for material study.
			CO3	The students will be able to understand the basic concepts about the thin film technology
			CO4	The students will be able to understand the importance of use of thin films in different application and research.
T.Y.B.Sc.	PHY-357	Physics Laboratory-3A	**CO1**	The students will be able to use various instruments and equipment.
			CO2	The students will be able to design experiments to test a hypothesis and/or determine the value of an unknown quantity.
			CO3	The students will be able to investigate the theoretical background to an experiment.
			CO4	The students will be able to set up experimental equipment to implement an experimental approach.

			CO5	The students will be able to analyze data, plot appropriate graphs and reach conclusions from your data analysis.
			CO6	The students will be able to work in a group to plan, implement and report on the experiments.
			CO7	The students will develop a habit of keeping a well-maintained and instructive laboratory logbook.
T.Y.B.Sc.	PHY-358	Physics Laboratory-3B	**CO1**	The students will be able to work on a computer in Linux environment.
			CO2	The students will be able to write a C code to solve scientific problems numerically.
			CO3	The students will be able to design electronic circuits for different purposes.
			CO4	The students will be able to collect data through observation and/or experimentation and visualizing and interpreting data.
			CO5	The students will be able to understand the laboratory procedures including safety and scientific methods.
			CO6	The students will be able to understand the abstract concepts and theories by experiencing and visualizing them as authentic phenomena.
			CO7	The students will be able to acquire the complementary skills of collaborative learning and teamwork.
T.Y.B.Sc.	PHY-359	Project-I	**CO1**	The students will be able to understand a general definition of research design.
			CO2	The students will be able to design experiments to test a hypothesis.
			CO3	The students will be able to collect and analyze data to reach conclusions related to the hypothesis.
			CO4	The students will be able to work in a group to plan, implement and document on the systematic study to

				solve a research problem.
			CO5	The students will become familiar with ethical issues and plagiarism related to research and documentation.
T.Y.B.Sc.	PHY-3510(G)	Python Programming	**CO1**	The students will be able to develop the flowchart and algorithm related to a problem.
			CO2	The students will be able to understand the basic concepts and syntax of Python programming.
			CO3	The students will be able to use different Python modules to solve Physics problems.
			CO4	Object oriented problem solving skills will be developed.
T.Y.B.Sc.	PHY-3511(K)	Physics Workshop Skill	**CO1**	The students will be able to understand the working principles of different instruments.
			CO2	The students will be able to use different mechanical and electrical measuring instruments in Physics experiments.
			CO3	The students will be able to understand the working and use of CRO.
			CO4	The students will be able to understand the working and use of signal generators.
			CO5	The students will be able to develop different Impedance Bridges and Q-Meters for electrical experiments.
SEMESTER VI				
T.Y.B.Sc.	PHY-361	Solid State Physics	**CO1**	The students will be able to understand the basic concepts on structures and properties of materials.
			CO2	The students will be able to understand phenomenon of superconductivity and its properties.
			CO3	The students will be able to understand different experimental techniques used for characterization of materials.

			CO4	Quantitative problem solving skills will be developed.
T.Y.B.Sc.	PHY-362	Quantum Mechanics	**CO1**	The students will be able to understand the basic concepts of quantum mechanics.
			CO2	The students will be able to understand the use of quantum mechanics to understand different physical system.
			CO3	The students will be able to use the quantum mechanical operator to for different physical problems.
			CO4	Quantitative problem solving skills will be developed.
T.Y.B.Sc.	PHY-363	Thermodynamics and Statistical Physics	**CO1**	The students will be able to understand the fundamental laws of thermodynamics.
			CO2	The students will be able to understand the basics of kinetic theory of gases.
			CO3	The students will be able to understand the fundamentals of statistical mechanics.
			CO4	The students will be able to understand quantum statistical laws governing different particles.
			CO5	Quantitative problem solving skills will be developed.
T.Y.B.Sc.	PHY-364	Nuclear Physics	**CO1**	The students will be able to understand the basic concepts nucleus and its properties and nuclear forces.
			CO2	The students will be able to understand the working and use of particle accelerators and detectors.
			CO3	The students will be able to understand the concepts of radioactivity and nuclear reactions.
			CO4	The students will be able to understand the basic concepts of energy generation using nuclear fuel.
			CO5	Quantitative problem solving skills will be developed.
T.Y.B.Sc.	PHY-365	Electronics-II	**CO1**	The students will be able to understand the fundamentals of working of semiconductor and special

				devices made out of it.
			CO2	The students will be able to understand the characteristics of special semiconductor devices.
			CO3	The students will be able to understand the basics logic gates and Boolean algebra to understand digital electronics.
			CO4	The students will be able to understand the applications of electronic devices for daily use.
			CO5	Quantitative problem solving skills will be developed.
T.Y.B.Sc.	PHY-366(P)	Physics of Nanomaterials	**CO1**	The students will be able to understand the basic concepts about the Nano materials.
			CO2	The students will be able to understand the different techniques to synthesize nano materials.
			CO3	The students will be able to understand the different characterization techniques to study nano materials.
			CO4	The students will be able to understand the use of nano materials in design and synthesis of novel materials.
			CO5	Quantitative problem solving skills will be developed.
T.Y.B.Sc.	PHY-367	Physics Laboratory-4A	**CO1**	The students will be able to understand the working and use of various advanced instruments and equipments.
			CO2	The students will be able to design experiments to test a hypothesis and/or determine the value of an unknown quantity.
			CO3	The students will be able to investigate the theoretical background to an experiment.
			CO4	The students will be able to set up experimental equipment to implement an experimental approach.
			CO5	The students will be able to analyze

				data, plot appropriate graphs and reach conclusions from your data analysis.
			CO6	The students will be able to work in a group to plan, implement and report on the experiments.
			CO7	The students will develop a habit of keeping a well-maintained and instructive laboratory logbook.
T.Y.B.Sc.	PHY-368	Physics Laboratory-4B	**CO1**	The students will be able to understand the working and use of various advanced instruments and equipments.
			CO2	The students will be able to design experiments to test a hypothesis and/or determine the value of an unknown quantity.
			CO3	The students will be able to investigate the theoretical background to an experiment.
			CO4	The students will be able to set up experimental equipment to implement an experimental approach.
			CO5	The students will be able to analyze data, plot appropriate graphs and reach conclusions from your data analysis.
			CO6	The students will be able to work in a group to plan, implement and report on the experiments.
			CO7	The students will develop a habit of keeping a well-maintained and instructive laboratory logbook.
T.Y.B.Sc.	PHY-369	Project-II	**CO1**	The students will be able to understand a general definition of research design.
			CO2	The students will be able to design experiments to test a hypothesis.
			CO3	The students will be able to collect and analyze data to reach conclusions related to the hypothesis.
			CO4	The students will be able to work in a group to plan, implement and document on the systematic study to solve a research problem.

			CO5	The students will become familiar with ethical issues and plagiarism related to research and documentation.
T.Y.B.Sc.	PHY-3610(U)	Scientific Data Analysis using Python	**CO1**	The students will be able to understand the basics of data processing.
			CO2	The students will be able to generate proper data set for analysis after cleaning and binning the big data.
			CO3	The students will be able to develop a model and test it's validity.
			CO4	The students will be able to visualize the data for better representation.
T.Y.B.Sc.	PHY-3611(AA)	Radiation Physics	**CO1**	The students will be able to understand the basics concepts related to interaction of radiation with matter.
			CO2	The students will be able to measure the amount of exposed radiation using different radiation detectors.
			CO3	The students will be able to understand the different source of nuclear radiation.
			CO4	The students will be able to understand the use of radiation shielding.

Name of the Programme: B.Sc. Zoology

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
F.Y.B.Sc.	ZO-111	Animal Diversity I	**CO1**	The student will be able to understand classify and identify the diversity of animals.
			CO2	The student understands the importance of classification of animals and classifies them effectively using the six levels of classification.
			CO3	The student knows his role in nature as a protector, preserver and promoter of life which he has achieved by learning, observing and understanding life.
F.Y.B.Sc.	ZO-112	Animal Ecology	**CO1**	The learners will be able to Identify and critically evaluate their own beliefs, values and actions in relation to professional and societal standards of ethics and its impact on ecosystem and biosphere due to the dynamics in population.
			CO2	To understand anticipate, analyse and evaluate natural resource issues and act on a lifestyle that conserves nature.
			CO3	The Learner understands and appreciates the diversity of ecosystems and applies beyond the syllabi to understand the local lifestyle and problems of the community.
			CO4	The learner will be able to link the intricacies of food chains, food webs and link it with human life for its betterment and for non-exploitation of the biotic and abiotic components.
			CO5	The working in nature to save environment will help development of leadership skills to promote betterment of environment.
F.Y.B.Sc	ZO113	Zoology Practical Paper	**CO1**	The student will be able to understand classification and identification of the diversity of animals.

			CO2	The student understands the significance of taxonomy of animals
			CO3	The learners understand the terminology required in system of classification.
			CO4	Ability to love and understand the fascinating world of invertebrates.
			CO5	Get a concrete idea of the evolution, hierarchy and classification of invertebrate phyla
			CO6	Understand the basics of systematics by learning the diagnostic and general characters of various groups
			CO7	Getting an overview of typical examples in each phyla.
			CO8	The learners will be able to critically assess their own beliefs, values and actions in accordance to professional and social standards of ethics and its impact on ecosystem and biosphere due to the dynamics in population.
			CO9	Understand antedate, analyse and evaluate natural resource issues and act on a way of life that preserves natural resources.
			CO10	The students understand kinds of the ecosystem and applies beyond the syllabi to understand the local lifestyle and difficulties of the community.
			CO11	The student knows his role in nature as a protector, preserver and promoter of life which he has achieved by learning, observing and understanding life.
			CO12	Ability to Estimate of dissolved oxygen and CO2 & O2.
			CO13	Ability to construct food web.
SEMESTER II				
F.Y.B.Sc.	ZO-121	Animal Diversity II	**CO1**	The student will be able to understand classify and identify the diversity of animals.
			CO2	The student understands the importance of classification of animals and classifies them effectively using the six levels of classification.
			CO3	The student knows his role in nature as a protector, preserver and promoter of life

				which he has achieved by learning, observing and understanding life.
F.Y.B.Sc.	ZO-122	Cell biology	**CO1**	The learner will understand the importance of cell as a structural and functional unit of life.
			CO2	The learner understands and compares between the prokaryotic and eukaryotic system and extrapolates the life to the aspect of development.
			CO3	The dynamism of bio membranes indicates the dynamism of life. Its working mechanism and precision are responsible for our performance in life.
			CO4	The cellular mechanisms and its functioning depends on endo-membranes and structures. They are best studied with microscopy.
F.Y.B.Sc.	ZO123	Zoology Practical Paper	**CO1**	The students will be able to understand the Animal diversity around us.
			CO2	The students will be able to classify animals correctly by using the six levels of classification.
			CO3	The students will be able to understand the dissimilarities and similarities in the many aspects of classification.
			CO4	Learn the evolution, hierarchy and classification of different classes of chordates
			CO5	Get an overview of the morphology and physiology of typical examples.
			CO6	The learner will be able to recognise the possible group of the invertebrate and vertebrates observed in surroundings and understand our role as a caretaker and promoter of life.
			CO7	The learner will understand the significance of cell as a structural and functional unit of life.
			CO8	The students will be able to understand application of cytological techniques in the field of cell biology
			CO9	The student will be able to understand cell cycle and cell division with the help of microscopy.
SEMESTERIII				
S.Y.B.Sc.	ZO-231	Animal Diversity	**CO1**	The students will be able to understand,

		III		classify and identify the diversity of higher vertebrates.
			CO2	The students will able to understand the complexity of higher vertebrates
			CO3	The students will be able to understand different life functions of higher vertebrates.
			CO4	The students will be able to understand the linkage among different groups of higher vertebrates.
			CO5	The student will become aware regarding his role and responsibility towards nature as a protector, to understand his role as a trustee and conservator of life which he has achieved by learning, observing and understanding life.
S.Y.B.Sc.	ZO-232	Applied Zoology I	**CO1**	The learner understands the biology, varieties of silkworms and the basic techniques of silk production.
			CO2	The learner understands the types of agricultural pests, Major insect pests of agricultural importance and Pest control practices.
S.Y.B.Sc.	ZO-233	Zoology Practical Paper	**CO1**	The students will be able to identify and classify the lower vertebrate animal group
			CO2	The students will be able to explain structure of different types of scales and tails in fishes.
			CO3	The students will be able to demonstrate the architecture of digestive system and brain of local fishes.
			CO4	The students will be able to know the keys of identification of local fishes.
			CO5	The students will be able to learn the technique of temporary slide preparation of fish scale.
			CO6	The students will be able to make field visit report on diversity of pond ecosystem on the basis of their real experience.
			CO7	The students will be able to understand the biology of honeybees and application of various tools/equipment in management of Apiary
			CO8	The students will be able to understand

				the biology of Silk moth and application of various tools/equipment used in sericulture.
			CO9	The students will be able to explain the marks of identification, nature of damage, economic importance and control measures of various agricultural, stored grain and non-insect pests.
			CO10	The students will be able to understand the structure and functioning of pest control appliances
			CO11	The students will be able to make field visit report on Sericulture/Agricultural farm on the basis of their real experience.
SEMESTER IV				
S.Y.B.Sc.	ZO-241	Animal Diversity IV	**CO1**	The students will be able to understand, classify and identify the diversity of higher vertebrates.
			CO2	The students will able to understand the complexity of higher vertebrates
			CO3	The students will be able to understand different life functions of higher vertebrates.
			CO4	The students will be able to understand the linkage among different groups of higher vertebrates.
S.Y.B.Sc.	ZO-242	Applied Zoology II	**CO1**	The learner understands the basics about beekeeping tools, equipment, and managing beehives.
			CO2	The learner understands the basic information about fishery, cultural and harvesting methods of fishes and fish preservation techniques.
S.Y.B.Sc.	ZO-243	Zoology Practical Paper	**CO1**	The students will be able to identify and classify the higher vertebrate animal group
			CO2	The students will be able to distinguish between poisonous and non-poisonous snakes on the basis of structural differences.
			CO3	The students will be able to understand the evolutionary basis of beak and feet modification in birds.
			CO4	The students will be able to explain the

				structure of Digestive System, Heart and Brain of Rat.
			CO5	The students will be able to document the Avian and Reptilian diversity around their vicinity.
			CO6	The students will be able to document a report on their own experience of an animal biodiversity spot.
			CO7	The students will be able to explain the biology of honeybee, tools and techniques of beekeeping and Management of Bee Colony.
			CO8	Students will be able to elaborate the identification, classification, habit, habitat and economic importance of various fishes and aquatic animals.
			CO9	Students will be able to understand the techniques to maintain Aquarium.
			CO10	Students will be able to explain structure and application of various fishing crafts and gears used in Indian fisheries.
			CO11	Students will be to estimate total protein from fish muscle sample.
			CO12	The students will be able to make field visit report on Apiculture/Fish industry on the basis of their real experience.
SEMESTER V				
T.Y.B.Sc.	ZO-351	Pest Management	**CO1**	Define pest management.
			CO2	Describe the economic, ecological, and sociological benefits of IPM.
			CO3	Distinguish positive and negative impacts of pesticide use.
			CO4	Understand problems resulting from misuse, overuse, and abuse of chemical pesticides.
			CO5	Define and describe pesticide resistance and how it develops.
			CO6	Identify ecological and biological characteristics important in development of pest populations.
			CO7	Identify 10 tactics commonly used in IPM and be able to distinguish them.

			CO8	Understand society's role in IPM decisions.
			CO9	Describe different groups of pests and compare them to weeds and plant pathogens.
			CO10	Analyse and compare management tactics to determine the best approach to reducing pest populations, weeds, and disease presence.
			CO11	Locate appropriate, scientifically valid sources of information on specific tactics to manage insect pests, weeds, and diseases.
			CO12	Know and how to develop an IPM program.
T.Y.B.Sc.	ZO-352	Histology	**CO1**	The students will be able to understand, classify and identify the different types of tissue.
			CO2	The students will understand the complexity of various tissues in an organ.
			CO3	The students will be able to learn structure & functions of various tissues.
			CO4	The students will understand the various diseases related to organs.
			CO5	The student will be able to know the role of glands in mammals.
T.Y.B.Sc.	ZO-353	Biological Chemistry	**CO1**	Learners shall be able to understand basic concepts and significance of biochemistry
			CO2	The students will learn about the pH and Buffers.
			CO3	The students will learn about the chemical structures of carbohydrate, and their biological and clinical significance.
			CO4	The students will be able to understand, interpret structure and importance of proteins, carbohydrates and lipids
			CO5	Learners will be able to comprehend variations in enzyme activity and kinetics.
T.Y.B.Sc.	ZO-354	Genetics	**CO1**	To understand the Mendel's principles of inheritance & exception to Mendel's principles of inheritance
			CO2	The students will be able to understand the causes of mutations & mutagenic

				agents
			CO3	Describe how a change in genetic material influences function
			CO4	Explain the principles of Population genetics.
			CO5	The students will be able to understand the methods of sex determination in different organism
			CO6	Relate population genetics to evolution
			CO7	Articulate the importance of genetics to societal, medical, and personal issues
T.Y.B.Sc.	ZO-355	Developmental Biology	**CO1**	Define the terms in developmental biology
			CO2	Explain the various theories of developmental biology
			CO3	Explain the types of eggs, concept of fertilization, cleavage pattern and gastrulation.
			CO4	Explain the concept of growth and differentiation.
			CO5	Compare and contrast between the spermatogenesis and oogenesis.
			CO6	Identify and describe the various developmental stages of chick embryo
T.Y.B.Sc.	ZO-356	Parasitology	**CO1**	The students will be able to learn about basics and scope of parasitology.
			CO2	The students will be able to learn the types of host and parasite with examples.
			CO3	The students will be able to learn about the morphology, life cycle, pathogenicity and treatment of common parasites (Protists and Platyhelminthes).
			CO4	The students will be able to learn about host -parasite relationships and their effects on host body.
			CO5	The students will be able to learn about the arthropod parasites and their role as vector.
T.Y.B.Sc.	ZO-3510	Aquarium Management	**CO1**	The students will be able to identify both exotic and endemic aquarium fishes.
			CO2	The students will be able to identify the equipment and protocols of aquarium

				keeping
			CO3	The students will be able to understand the biology of aquarium fishes.
			CO4	The students will be able to set up and maintain freshwater aquarium
			CO5	The students will be able to maintain proper water quality of fresh water aquariums
			CO6	The students will be able to follow biosecurity protocols and ensure safety, hygiene in marine and freshwater aquariums.
			CO7	The students will be able to learn about feeding, breeding, transportation and preservation methods of aquarium fshes.
T.Y.B.Sc.	ZO-3511	Poultry Management	**CO1**	The students will be able to understand the Poultry farming practices.
			CO2	The students will able to understand the poultry breeding techniques.
			CO3	The students will be able to understand poultry rearing techniques.
			CO4	The students will be able to understand feeding requirement and food ingredients.
			CO5	The students will be able to understand the poultry disease and their pathogens.
			CO6	The students will be able to understand market value of poultry products.
T.Y.B.Sc	ZO-357	Zoology Practical Paper – I	**CO1**	Understand the basic tools and techniques useful for pest management.
			CO2	Characterize the major components of pest management strategies and compare their relative merits for different pests and crops.
			CO3	Understand the life cycle stages of important insect pests and able to think the possible ways to control the population of harmful insect pest.
			CO4	Understand the histological architecture of various organs with the help of permanent slides through the microscopic examinations.

			CO5	Learn to prepare the histological mountings of tissues with the help of temporary mounting of tissues techniques.
T.Y.B.Sc	ZO-358	Zoology Practical Paper – II	**CO1**	The students will be understand about the pH and Buffers.
			CO2	The students will be able to detect the different carbohydrates with the help of appropriate tests.
			CO3	The learners will be able to understand the variations in enzyme activity and kinetics.
			CO4	The students will be able to learn Preparation of Acid, Alkali & it's standardisation.
			CO5	Develop skill in simple biochemical laboratory procedures.
			CO6	The students will be able to understand basic Mendelian genetics.
			CO7 CO8	The students will be able to understand about the genetics behind the blood groupings system, karyotyping of chromosomes, chromosomal mutations and genetic disorders.
T.Y.B.Sc	ZO-359	Zoology Practical Paper – III	**CO1**	Familiar with various stages involved in the developing embryo
			CO2	Apply the knowledge to collect various Biological data
			CO3	Understand the initial development al procedures involved in Amphioxus, frog and chick.
			CO4	Familiarise with the principle of developmental biology.
			CO5	Identify the different types of parasites.
			CO6	Classify each parasite.
			CO7	Describe the structure of each parasite.
			CO8	Explain the parasites' life cycles.
			CO9	Discuss the relationship between each parasite and its host.
			CO10	Assess the reasons of infection with parasites.
			CO11	Conduct procedures related to isolation and identification of some parasites.
			CO12	Report the best identification method for parasites causing some diseases.

SEMESTER VI				
T.Y.B.Sc.	ZO-361	Medical & Forensic Zoology	**CO1**	The students will be able to understand the basics principles of Medical and Forensic Zoology.
			CO2	The students will able to understand scientific methods in crime detection.
			CO3	The students will be able to understand the advancements in the field of Medical and Forensic Zoology.
			CO4	The students will be able to understand modern tools, techniques and skills in forensic investigations.
			CO5	The students will be able to describe the fundamental principles and functions of forensic science and its significance to human society.
T.Y.B.Sc.	ZO-362	Animal Physiology	**CO1**	The students will be able to describe the various physiological organ-systems and their importance to the integrative functions of the human body.
			CO2	The students will be able to understand Concept of energy requirements
			CO3	The students will be able to explain various aspects of Digestive physiology.
			CO4	The students will be able to describe circulatory system and identify the medical conditions
			CO5	The students will be able to understand Respiratory mechanism and gases transport.
			CO6	The students will be able to understand the mechanism of eliminations of waste materials from the body.
			CO7	The students will be able to explain the structure and functions of muscles
			CO8	The students will be able understand formation of gametes and function of endocrine glands.
T.Y.B.Sc.	ZO-363	Molecular Biology	**CO1**	Learner shall get an insight into molecular mechanisms of various biological processes in cells and organisms
			CO2	Learner shall get an insight into the Structure of DNA and RNA, DNA and

				RNA as genetic material
			CO3	The course shall prepare learner to get insight into the Central Dogma of Molecular Biology
			CO4	Learner shall also understand the concept of gene regulation
			CO5	Learner shall get an insight into the DNA Damage and Repair
T.Y.B.Sc.	ZO-364	Entomology	**CO1**	Students will understand basic concepts in Entomology and its scope.
			CO2	Students will learn morphology and anatomy of Insects.
			CO3	Students will understand the concept of social organization in Insects.
			CO4	Students will understand the development process of Insects.
			CO5	Students will identify disease causing insect vectors.
			CO6	Students will be able to design and implement pest controlling methods against pests.
T.Y.B.Sc.	ZO-365	Techniques in Biology	**CO1**	Students will be able to explain the importance and applications of techniques in biology
			CO2	Students will be able to explain the principle and applications of various microscopic techniques.
			CO3	Students will be able to explain the principle, working, materials used and applications of microtomy, haematological and immunological techniques,
			CO4	Students will be able to compare and contrast between different types of PCR
			CO5	Students will be able to describe DNA barcoding
			CO6	Students will be able to apply various methods and biodiversity indices for biodiversity assessment
			CO7	Students will be able to able to used various digital instruments and software's for image capturing and processing

T.Y.B.Sc.	ZO-366	Evolutionary Biology	**CO1**	Students will be able to learn most of the essential aspects of Evolutionary Biology in detail which will help them in acquiring better understanding regarding the subject.
			CO2	Students will be able to explain important processes, principles and concepts and critically evaluate theories and empirical research within evolutionary biology
			CO3	Students will be able to apply evolutionary theory and concepts to address empirical and theoretical questions in evolutionary biology.
			CO4	Students will be able to investigate evolutionary questions using literature and analyses of empirical data independently.
			CO5	Students will be able to communicate the principles, theories, problems and research results associated with questions that lie within the evolutionary framework to students.
T.Y.B.Sc.	ZO-3610	Environmental Impact Assessment	**CO1**	Students will be able to understand terminologies associated with environment.
			CO2	Students will be able to describe the types and impact of various pollutions on environment.
			CO3	Students will be able to understand the concept of sustainable development.
			CO4	Students will be able to understand the various Environment Protection Acts
			CO5	Students will be able to examine a range of environmental impact assessments.
			CO6	Students will be able to identify and explore impact assessment fields and approaches
			CO7	To provide students with the knowledge and professional skills necessary to enable them to undertake environmental impact assessment.
T.Y.B.Sc.	ZO-3611	Project	**CO1**	Students will be able to understand the fundamentals of research.
			CO2	Students will be able to understand the process and flow of research.

			CO3	Students will be able to design the experiment to address the particular problem or hypothesis.
			CO4	Students will be able to identify, analyse and solve the societal and environmental problems by applying the previous knowledge.
			CO5	Students will be able to develop scientific approach to solve social and environmental issues.
T.Y.B.Sc.	ZO 367	Zoology Practical Paper I	**CO1**	Students will be able to carry out physico-chemical analysis of urine sample
			CO2	Students will be able to estimate the urea, uric acid and calcium level in blood serum
			CO3	Students will be able to understand the structural difference among the hairs belonging to various species.
			CO4	Students will be able to prepare slides of scale pattern of human hair.
			CO5	Students will be able to prepare a report on the functionality of Forensic Laboratory.
			CO6	Students will be able to identify and differentiate various types of Finger prints
			CO7	Students will be able to make of report of determination of time of death on the basis of insect development in dead body.
			CO8	Students will be able to perform the experiments related to hematological parameters.
			CO9	Students will be able to measure blood glucose level.
			CO10	Students will be able to understand the causes and symptoms of endocrine disorders.
			CO11	Students will be able to detect nitrogenous waste in sample.
			CO12	Students will be able to make kymograph & respirogram
T.Y.B.Sc.	ZO 368	Zoology Practical Paper II	**CO1**	Students will be able to understand the standards of lab safety and precautions

			CO2	Students will be able to detect, isolate, quantify the nucleic acid
			CO3	Students will be able to understand the principle, working and application of Spectrophotometer and PCR
			CO4	Students will be able to illustrate external morphology of insects and peculiarity of their different parts.
			CO5	Students will be able to explain digestive and reproductive system of local insects.
			CO6	Students will be able to elaborate social organization of termite.
			CO7	Students will be able to illustrate developmental stages of insects.
			CO8	Students will be able to explain pathogenicity of various insect vectors.
			CO9	Students will be able to preserve insects and their body parts of insects and permanent mounting of it.
			CO9	Students will be able to experience wildlife management practices and their significance through a visit to Wildlife sanctuary or National Park.
T.Y.B.Sc.	ZO 369	Zoology Practical Paper III	**CO1**	Students will be able to understand principle, working and application of different types of microscopes.
			CO2	Students will be able understand the tools and techniques of tissue fixation and microtomy.
			CO3	Students will be able to map the biodiversity around their vicinity.
			CO4	Students will be able to capture animal photograph for scientific documentation.
			CO5	Students will be able to witness habit habitat of faunal biodiversity at its natural habitat.
			CO6	Students will be able to understand the principle and working of PCR machine and application in DNA barcoding.
			CO7	Students will be able to explain the evolutionary connection between man and ape
			CO8	Students will be able to elaborate

				adaptation in different animal and their evolutionary significance.
			CO9	Students will be able to understand the evidences in favor of common ancestry
			CO10	Students will be able to explain the successive evolutionary stages of man
			CO11	Students will be able to understand pattern of animal distribution across the world with respect to different Zoogeographical Realms.

Name of the Programme: M.Sc. Zoology (NEP 2020)

❖ Program outcomes (POs) :

After successfully completing the M. Sc. Zoology program students will be able to :

1. Identify a range of invertebrates and vertebrates and justify their conservation.
2. Analyse the relationships of animals with abiotic factors and different biotic factors like plants and microbes. They will able to identify the species based on molecular taxonomy.
3. Apply the knowledge of Zoology, Life Sciences and allied subjects to the understanding of complex life processes and phenomena.
4. Identify, review research literature and analyse complex situations of living forms.
5. Design concepts that meet the specified needs with appropriate consideration for the public health, safety, cultural, societal, and environmental considerations.
6. Propose hypothesis, formulate tests, use various modern instruments for biological analysis, data collection, field surveys, interprets the data and find answers.
7. Distinguishes different ecosystems based on biological, chemical and physical features; correlates the morphology, physiology and behaviour with the properties of habitat.
8. Utilize research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions in real situations.
9. Create, select and apply appropriate techniques, resources and ICT tools for understanding of the subject.
10. Illustrate the impact of natural and anthropogenic activities in societal and environmental contexts and demonstrate the knowledge and need for sustainable development.
11. To sensitized regarding the ethical principles, professional ethics, responsibilities and norms of permission from the concerned agencies regarding animal experimentation and collection of biological resources.
12. Exhibits management skills in applied branches of Zoology like Vermiculture, Apiculture, Sericulture, Aquaculture, Agriculture & Entomology.
13. Elaborate knowledge and understanding of Zoology and management principles and apply these to one’s own work, as a member and leader in a team.

❖ Course Outcomes:

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
M.Sc. I	ZOO 501 MJ	Advanced Biochemistry	**CO1**	Understand the basic terminologies of Biochemistry.
			CO2	Describe the concepts and regulation of metabolism.
			CO3	Describe the oxidation of fatty acids and its significance.
			CO4	Illustrate the reactions, energetic and regulation of glycolysis, glycogen biosynthesis, TCA cycle, purine and pyrimidine metabolism.
			CO5	Draw the general reactions of various metabolic pathways.
			CO6	Justify the role of enzymes and their regulation in metabolism.
M.Sc. I	ZOO 502 MJ	Advanced Cell Biology	**CO1**	The learner will understand the preparation of staining methods and nuclear organization.
			CO2	Demonstrate the ability to use discipline specific research techniques.
			CO3	Organization of cytoskeleton and their associated protein.
			CO4	The learner will understand the application and pluripotency of stem cell.
			CO5	The learner will be aware about the cell culture & its applications.
			CO6	To understand the organization of cell signaling and their receptors.
M.Sc. I	ZOO 503 MJ	Comparative Embryology	**CO1**	The course gives detailed idea about advantage in the area of clinical embryology.
			CO2	Basic definitions and concepts in embryology.
			CO3	Concept of fertilization and how internal and external fertilization ensures species specificity.

			CO4	Different types of egg and cleavage patterns according to developmental need of embryo and processes of blastulation.
			CO5	To understand the mechanism of gastrulation resulting into separation of germ layers.
			CO6	To understand the mechanism of regeneration and metamorphosis in organisms.
M.Sc. I	ZOO 504 MJ	Medical Entomology	**CO1**	Understand, classify, and identify insects of medical and veterinary importance.
			CO2	Incorporate the subject knowledge in designing innovative techniques of vector control.
			CO3	Better prepared to contribute to the field of public and community health.
			CO4	Understand molecular aspects of diseases of medical importance.
			CO5	Capable of joining the research areas pertinent to vector borne diseases.
M.Sc. I	ZOO 505 MJ	Biosystematics & Biodiversity	**CO1**	Explain Fundamental concepts and principles used in Systematics and Biodiversity.
			CO2	Assess the current status of animal biodiversity of our Nation & the World and threats to biodiversity.
			CO3	Identity and classify major groups of animal kingdom.
			CO4	Apply techniques of animal collection, preservation, and identification.
			CO5	Explain and perform basic Taxonomic procedures employed by animal taxonomists.
			CO6	Explain and use Zoological nomenclature during taxonomic research.
			CO7	Explain and Discuss the basic concepts in molecular phylogenetics.
			CO8	Explain and apply Techniques used in Phylogenetic analysis and Calculation of biodiversity indices.

M.Sc-I	ZOO 506 MJP	Laboratory Exercises in Biochemistry and Cell Biology	**CO1**	Make the buffers of known pH and molarity.
			CO2	Estimate protein & carbohydrates from the given sample.
			CO3	Assess the enzyme activity and factors affecting it.
			CO4	Perform paper chromatography, thin layer chromatography.
			CO5	Analyse samples using thin layer and paper chromatography
			CO6	Isolate subcellular organelles and perform marker enzyme assays.
			CO7	Identify various stages of mitosis and meiosis.
			CO8	Understand and differentiate between dead and live cells.
			CO9	Isolate nuclei, lysosomes & mitochondria from cells.
M.Sc-I	ZOO 507 MJP	Laboratory exercises in Biosystematics, Biodiversity and Medical Entomology	**CO1**	Apply and perform the techniques of animal collection, preservation, and identification.
			CO2	Apply and perform the techniques of animal specimen storage and curation of preserved specimens.
			CO3	Apply and perform the calculation of biodiversity indices.
			CO4	Apply and Perform Phylogenetic analysis using MEGA software.
			CO5	Conduct biodiversity survey with scientific and non-invasive collection techniques and understand role as biodiversity protector, preserver and promotor of life of animals.
			CO6	Understand the medical importance of insects and their role as vector. Know the causes of arthropod-borne diseases.
			CO7	Know the role of insects in forensic investigations.
			CO8	Apply knowledge of prophylaxis or preventive measures against diseases caused by insect vectors.
M.Sc-I	ZOO 512 MJ	Fresh Water Zoology	**CO1**	Get introduced to the freshwater ecosystems.
			CO2	Illustrate the physical and chemical properties of water.
			CO3	Acquire skills to critically evaluate scientific aspects of Freshwater Zoology.
			CO4	Acquire skills to critically evaluate scientific aspects of Freshwater Zoology.

			CO5	Get aware with the threats and an opportunity to resolve the issues related to freshwater habitats.
			CO6	Introduced with the current issues of the subject.
M.Sc-I	ZOO 513 MJP	Laboratory Exercises in Freshwater Zoology	**CO1**	Get hands on training experience in limnological techniques.
			CO2	Will be able to identify freshwater invertebrates.
			CO3	Understand the relevance of freshwater fauna to the aquatic ecosystems.
			CO4	Able to culture zooplanktons.
			CO5	Understand the aquatic adaptations in freshwater fauna.
M.SC-I	ZOO 541 RM	Research Methodology	**CO1**	Explain concept of research methodology.
			CO2	Define research problem.
			CO3	Explain need of literature review in research.
			CO4	Prepare research designs and explain their characteristics.
			CO5	Collect and present the data.
			CO6	Analyse data by using appropriate tests.
			CO7	Write research report and research paper.
M.Sc-I	ZOO 542 RMP	Laboratory Exercises in Research Methodology	**CO1**	Suggest suitable title for a research article
			CO2	Write the abstract, key words, result, discussion, conclusion and citations of references.
			CO3	Write a research project proposal to seek funding.
			CO4	Use MS excel in presentation and analysis of data using common statistical tests.
			CO5	Conduct a scientific survey.
SEMESTER II				
M.Sc-I	ZOO 551 MJ	Molecular Biology	**CO1**	Discuss the basic features of chromatin essentially to get insight of gene.
			CO2	To study the structure and types of DNA and RNA, physical properties and topology of DNA and genome organization.
			CO3	Understand the details of DNA replication in prokaryotes and eukaryotes, enzymes involved in the

				process of replication, significance of replisome and primosome.
			CO4	Understand the process of transcription both in prokaryotes and eukaryotes with reference to enzymes involved in details, transcriptional unit.
			CO5	Understand the genetic code; ribosome structure.
M.Sc. I	ZOO 552 MJ	Comparative Endocrinology	**CO1**	Discuss the chemical signals & bioregulation of endocrine gland in vertebrates.
			CO2	Explain the synthesis, secretion, metabolism & mechanism of action of vertebrate hormone.
			CO3	Describe the hypothalamus - pituitary system.
			CO4	Justify the comparative aspects of hormones and their physiological functions / role in vertebrates.
			CO5	Describe the adrenal glands of mammalian and non - mammalian vertebrates.
			CO6	Explain the hormonal control of calcium and phosphate homeostasis.
			CO7	Discuss the comparative endocrinology of feeding, digestion and metabolism in vertebrates.

M.Sc-I	ZOO 553 MJ	Comparative Animal Physiology	**CO1**	Explain digestive system, concept of digestion and enzymes involved digestion.
			CO2	Understand the process of respiration and importance of O2 and CO2.
			CO3	Illustrate the structure of the skeletal muscle, proteins involved in muscle contraction and role of Calcium ions in contraction.
			CO4	Justify the concepts of osmole, osmolarity, tonicity and ionic regulation in different environment.
			CO5	Explain process of excretion, functions of mammalian kidney and role of Renin - Angiotensin system in excretion.
			CO6	Understand different thermo-biological terminology and mechanism of thermoregulation in different animals.
			CO7	Explain different types of sense organs and their functions.
M.Sc. I	ZOO 554 MJ	Biochemical Techniques	**CO1**	Understand the principle of light, fluorescence, scanning, transmission electron microscope.
			CO2	Understand the principle of centrifugation, various types of Centrifugations, rotors and its applications.
			CO3	Understand the principle and differences between various types of chromatography techniques.
			CO4	Know about agarose and polyacrylamide gel electrophoresis.
M.Sc. I	ZOO 555 MJ	Integrated Pest Management	**CO1**	Understand basics of IPM, principles, tools, ethics & significances.
			CO2	Detect and diagnose different insect pests, their diseases & calculate economic injury level, economic threshold level.
			CO3	Understand pesticides, fungicides, herbicides, bio-herbicides and different methods used for pest control.

			CO4	Know different Entomopathogenic organisms.
			CO5	Apply advanced technology for pest control.
MSC 1	ZOO 556 MJP	Laboratory Exercises in Biochemical & Molecular Techniques	**CO1**	Understand various components of light, fluorescence, scanning, transmission electron microscope.
			CO2	Perform density gradient centrifugation.
			CO3	Perform thin layer chromatography.
			CO4	Perform paper chromatography.
			CO5	Perform sterilization of lab equipment.
			CO6	Isolation and quantification of prokaryotic and eukaryotic nucleic acids.
			CO7	Understand how to extract and quantify DNA from samples.
			CO8	Understand how to extract and quantify RNA from samples.
			CO9	Understand how to extract and quantify proteins from samples.
			CO10	Know the in-depth knowledge about agarose and polyacrylamide gel electrophoresis.
MSC 1	ZOO 557 MJP	Laboratory Exercises in Comparative Animal Physiology & Endocrinology	**CO1**	Perform estimation of amylase from human saliva.
			CO2	Demonstrate oxygen consumption in relation to body size.
			CO3	Demonstrate rate of salt loss / gain in fish.
			CO4	Demonstrate effect of different physiological conditions on red blood cells.
			CO5	Perform detection of nitrogenous waste products in different animal groups.
			CO6	Perform estimation of sugar in rat / crab / human blood.
			CO7	Demonstrate bleeding & clotting time of human blood.
			CO8	Understand structural and functional difference between invertebrate and vertebrate neurosecretory and endocrine

				organs.
			CO9	Demonstrate location of endocrine glands
			CO10	Illustrate blood sugar regulation in the crab - role of eye stalk.
			CO11	Demonstrate alloxan diabetes introduction in mouse / rat
			CO12	Demonstrate pancreatectomy and thyroidectomy in experimental animals.
			CO13	Demonstrate effect of epinephrine on blood sugar level and liver glycogen.
MS.c-I	ZOO 562 MJ	Economic Zoology	**CO1**	To gain knowledge about economically important branches of zoology.
			CO2	To gain knowledge about aquaculture.
			CO3	To acquaint knowledge about the culture techniques of fish.
			CO4	To acquaint the knowledge about biofloc fish farming.
			CO5	To learn concepts of sponge cultivation and related practices.
			CO6	To motivate the students for starting their self-employment.
M.Sc-I	ZOO 563 MJP	Laboratory Exercises in Economic Zoology	**CO1**	To gain knowledge about economic importance of prawn species.
			CO2	To gain knowledge about economic importance of molluscs.
			CO3	To acquaint knowledge about the culture techniques of pearl.
			CO4	To acquaint the knowledge about biofloc fish farming.
			CO5	To learn tank design and construction.
			CO6	To motivate the students for starting their self-employment.
M.Sc-I	ZOO 581 OJT/FP	On Job Training OR Field Project	**CO1**	Develop problem-solving skills.
			CO2	Demonstrate knowledge of research processes.
			CO3	Develop hands-on experience in a specific field of zoology.

			CO4	Perform literature review using print and online databases.
			CO5	Select and define appropriate research problem and parameters to prepare a project report.
			CO6	Identify, explain, compare, and prepare the key elements of a research proposal.
			CO7	Compare and contrast quantitative and qualitative research paradigms.
			CO8	Use sampling methods, measurement scales and instruments, and appropriate uses of each.
			CO9	Develop awareness about biodiversity conservation.

SEMESTER III				
M.Sc. II	ZOUT231	Animal Physiology- I	**CO1**	After successfully completing this course, students will be able to: Explain the membrane physiology and its dynamics.
			CO2	Explain the concept of nutrition and digestion.
			CO3	Explain the structure, contraction and types of contraction of muscle.
			CO4	Illustrate bioluminescence and animal electricity with examples and its significance
			CO5	Correlate the organisms Internal and external environments with homeostasis and biological Clocks.
			CO6	Diagrammatically represent the mechanism of respiration, gas exchange and transport
M.Sc. II	ZOUT 232	Fundamentals of Systematics and Economic Zoology	**CO1**	After successfully completing this course, students will be able to: Explain principles, methods of biological classification and diversity in kingdom Animalia.
			CO2	Explain the importance of taxonomic keys and taxonomic characters.
			CO3	Explain the principles of zoological classification and nomenclature
			CO4	Discuss the various taxonomic procedures and molecular phylogenetics & phylogeography.
			CO5	Illustrate the methodologies used in systematics.
			CO6	Illustrate the lac culture, apiculture, prawn culture, vermiculture, Poultry, dairy industry and Piggery.
			CO7	Explain the role of insects of economic importance.
			CO8	Explain parasitic roundworms of animal and plants.
			CO9	Signify the role of parasitic and soil protozoan in human welfare.
			CO10	Justify the use of animals in

				pharmaceutical research.
			CO11	Explain coral reef and its significance.
M.Sc. II	ZOUT 233	Research Methodology and Insect Physiology and Biochemistry	**CO1**	After successfully completing this course, students will be able to: Demonstrate knowledge of research processes (reading, evaluating, and developing)
			CO2	Perform literature reviews using print and online databases.
			CO3	Select and define appropriate research problem and parameters to prepare a project proposal.
			CO4	Identify, explain, compare, and prepare the key elements of a research proposal/report.
			CO5	Compare and contrast quantitative and qualitative research paradigms
			CO6	Use sampling methods, measurement scales and instruments, and appropriate uses of each.
			CO7	Justify the rationale for research ethics,
			CO8	Explain the structure, Chemistry of integument and sclerotization.
			CO9	Describe the process of digestion and metabolism
			CO10	Explain the characteristics of haemolymph and types of haemocytes.
			CO11	Illustrate the structure, physiology and biochemistry of flight muscle.
			CO12	Demonstrate the process of excretion, detoxification and water balance
			CO13	Justify the role of insect hormones in physiological processes.
M.Sc. II	ZODT 234	Immunology	**CO1**	After successfully completing this course, students will be able to: List the primary and secondary immune organs.
			CO2	Explain the concepts of immunity, self-nonself immune response, autoimmune disease.
			CO3	Explain the theories of antibody synthesis and generation of antibody diversity.

			CO4	Explain the principle and application of the common techniques used in Immunology
			CO5	Illustrate the events and dynamics of inflammation
			CO6	Compare the MHC molecules and diseases associated with HLA.
			CO7	Differentiate between active and passive immunization
			CO8	Compare the three pathways of complement fixation pathway.
M.Sc. II	ZODP 234	Zoology Practical Paper-3 (Immunology)	**CO1**	Identify the pattern of identity of antigen- antibody reaction.
			CO2	Identify the microscopic structure of the lymphoid organs.
			CO3	Demonstrate immunoelectrophoresis technique.
			CO4	Demonstrate the double diffusion techniques.
			CO5	Detect the human blood groups by antigen -antibody reactions
			CO6	Prepare the human blood smear to identify various blood cells.
M.Sc. II	ZOUP 235	Special Lab I Module-I: Animal Physiology-I	**CO1**	Demonstrate the effect of body size and salinity on oxygen consumption in given animals.
			CO2	Demonstrate the effect of starvation on liver and muscle glycogen in given animal.
			CO3	Demonstrate the effect of exercise on breathing, pulse rate and blood lactate level.
			CO4	Demonstrate the effect of pH, temperature and inhibitors on salivary amylase.
			CO5	Map the taste buds on human tongue
M.Sc. II	ZOUP 235	Special Lab I Module-II: Fundamentals of Systematics and Economic Zoology	**CO1**	Identify museum specimen/pictures of minor phyla, Invertebrates, Protochordates and Vertebrates.
			CO2	Identify animals with the help of taxonomic keys.
			CO3	Collect and preserve animal samples using common methods.

			CO4	Write scientific report of field/ institutional visit.
			CO5	Compare the methods of collection and curation of insects.
			CO6	Identify the poultry breeds.
			CO7	Identify edible freshwater fish from nearby area.
			CO8	Demonstrate the apiculture equipment.
			CO9	Demonstrate the methods of prawn culture.
			CO10	Compare various fishing tools, crafts and gears.
M.Sc. II	ZOUP 235	Special Lab I Module-III: Research Methodology and Insect Physiology and Biochemistry	**CO1**	Use MS excel in presentation and analysis of data using common statistical tests.
			CO2	Suggest a suitable title for a research article.
			CO3	Write the abstract, key words, result, discussion, conclusion and citations of references.
			CO4	Write a research project to seek funding.
			CO5	Conduct a scientific survey.
			CO6	Perform protein purification experiment.
			CO7	Demonstrate the heart and haemocytes of cockroach.
			CO8	Demonstrate the effect of starvation on glycogen in insects.
			CO9	Demonstrate the effect of temperature on water loss in cockroach.
			CO10	Detect the amino acids in insect haemolymph by chromatographic method.
			CO11	Determine the oxygen consumption in dragon fly nymph.
			CO12	Perform the assay of amylase activity in midgut of insect.
SEMESTER IV				
M.Sc. II	ZOUT 241	Animal Physiology- II	**CO1**	After successfully completing this course, students will be able to: Explain the composition of blood, types of blood cells, vascular dynamics and clotting.

			CO2	Illustrate the anatomy and physiology of heart and cardiac cycle
			CO3	Describe the excretory system, nitrogenous wastes and renal regulation
			CO4	Illustrate the osmoregulatory mechanism in invertebrates and vertebrates
			CO5	Discuss the neuronal physiology and various potentials.
			CO6	Justify the location and structure of eye, ear and taste buds to their functions.
			CO7	Justify energy utilization in physiological and metabolic activities.
M.Sc. II	ZOUT 242	Mammalian Reproductive Physiology and Aquaculture	**CO1**	After successfully completing this course, students will be able to: Explain the male and female reproductive systems and sexual dimorphic characteristics
			CO2	Explain the sexual cycles with examples
			CO3	Illustrate the reproductive dysfunctions.
			CO4	Diagrammatically represent the hormonal regulation of reproductive processes like pregnancy, lactation and parturition.
			CO5	Prepare the flow chart to demonstrate the hormonal coordination of reproductive processes.
			CO6	Justify the artificial control of reproduction.
			CO7	Identify the fish diseases and the causative organisms
			CO8	Mention the various composite fish culture with significance of each type.
			CO9	Describe the methods of freshwater prawn culture and its management.
			CO10	Explain the methods of pearl culture and pearl harvesting.
			CO11	Illustrate the preparation and management of fish culture ponds.
			CO12	Demonstrate the methods of packaging and transport of fish and brood fish.
			CO13	Illustrate techniques of fish harvesting, preservation & processing.

			CO14	Compare the techniques used in fishery development.
M.Sc. II	ZODT 243	Pest Control	**CO1**	After successfully completing this course, students will be able to: Explain the Pest, nature of damage caused by pests and pest control.
			CO2	Explain medical, veterinary, Household and stored grain pests.
			CO3	Explain the Principles and methods of pest control including Biological control measures.
			CO4	Explain the Integrated pest management (IPM)
			CO5	Explain the Non- insect pest and their control: Rat, Bandicoots, Crabs, Snails, Slugs, Birds and Squirrels.
			CO6	Explain the principle and working of pesticide appliances.
M.Sc. II	ZODT 244	Apiculture	**CO1**	After successfully completing this course, students will be able to: Explain the basic concepts of apiculture like systematics, colony organization, polymorphism, morphology and foraging.
			CO2	CO2: Explain the tools and management of apiary.
			CO3	CO3: Explain the importance of institutions pertinent to apiculture.
			CO4	CO4: Discuss the setup of beekeeping business.
			CO5	CO5: Illustrate the bee keeping as occupation.
			CO6	Justify the presence of bees to increase the agriculture productivity.
M.Sc. II	ZODP 243	Zoology Practical Paper- 4 Animal Physiology- II	**CO1**	Determine the bleeding and clotting time of human blood.
			CO2	Demonstrate the invertebrate heart.
			CO3	Calculate the heartbeats of Daphnia/*Drosophila* larva.
			CO4	Determine serum urea and protein and glucose in human blood and urine.
			CO5	Justify the effects of various physical and chemical factors on frog heart and

				muscle.
M.Sc. II	ZODP 243	Zoology Practical Paper- 4 Pest Control	**CO1**	Identify beneficial and harmful insects.
			CO2	Identify and classify insect pest of agricultural, veterinary and public health importance.
			CO3	Know the effects of contact insecticides and fumigants on behavior of insect pests.
			CO4	Determine the LD50
			CO5	Behavior of insects to repellants and attractants.
			CO6	Know the principle and working of pesticide appliances.
			CO7	Identify and know the role of biological controlling agents.
			CO8	Know the non-insect pests.
M.Sc. II	ZODP 244	Zoology Practical Paper- 5 Mammalian Reproductive Physiology	**CO1**	Identify the histological slides of reproductive organ/tissues.
			CO2	Explain the various types of placenta in mammals.
			CO3	Comment on merits and demerits of contraceptive devices/methods.
			CO4	Illustrate the technique of gonadectomy.
			CO5	Perform vaginal smear technique to identify the phases of oestrous cycle.
			CO6	Distinguish the male and female anatomical features of reproductive system in mammals.
M.Sc. II	ZODP 244	Zoology Practical Paper- 5 Aquaculture	**CO1**	Identify Indian oysters.
			CO2	Identify the common freshwater fish used in culture farming.
			CO3	Demonstrate the processing and storing methods for fish and prawn.
			CO4	Test the freshness of fish/prawn by histological methods.
			CO5	Test the freshness of fish/prawn by biochemical methods.
			CO6	Prepare the culture of Daphnia and rotifers.
			CO7	Estimate the productivity of water bodies.
M.Sc. II	ZODP	Zoology Practical	**CO1**	Identify the honey bees

	244	Paper- 5 Apiculture	**CO2**	Explain the bee morphology and behaviour
			CO3	Illustrate the bee enemies
			CO4	Justify the rearing techniques and bee management.

Name of the Program: B.Voc (Medical Lab Technology)

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
F Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	MLT-111	HUMAN ANATOMY-I	C01	Demonstrate the basic concepts to learn the terminology of the subject and basic knowledge of cells & tissues and to understand anatomy of human body.
			C02	To develop an understanding of the structure and function of organs and organ systems in normal human body.
			C03	It is effectively appropriate terminology to effectively communicate information related to anatomy and recognize the anatomical structures.
F Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	MLT-112	HUMAN PHYSIOLOGY-I	C01	Demonstrate to integrate basic knowledge of cells, tissues, blood, physiological functions and diseases of system.
			C02	To develop an understanding of the function of organs and organ systems in normal human body.
			C03	It is able to reveal the physiological systems of body and also understand the basis of diseases.
F Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	MLT-113	BIOCHEMISTRY-I	C01	Demonstrate a basic understanding of reagent preparation, instrument handling and can perform common analytical in Clinical Biochemistry.
			C02	Formulated to impart basics knowledge of biochemistry, apparatus, units, equipment, and volumetric analysis in the Clinical Biochemistry.

F Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-114**	**FUNCTIONAL ENGLISH**	**C01**	Reading and listening Skills: Students will become accomplished, active readers and listeners who are able to appreciate ambiguity and complexity and who can articulate their own interpretation with an awareness and curiosity for other's perspectives.
			C02	Writing Skills: Students will be able to write effectively for a variety of professional and social settings.
			C03	Oral Communication Skills: Students will demonstrate the skills needed to participate in conversation that builds knowledge collaboratively.
F Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT 115 (P)**	**PRACTICAL'S IN HUMAN ANATOMY-I**	**CO1**	On completion of this course, students will be able to .Devise pseudo codes and flowchart for computational problems.
			CO2	Write, debug and execute simple programs in 'C'.
F Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT 116 (P)**	**PRACTICAL'S IN COMPUTER FUNDAMENTALS**	**C01**	Create database tables in postgreSQL.
			C02	Write and execute simple, nested queries.
SEMESTER II				
F Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-231 (T)**	**Human Anatomy-II**	**C01**	Gain the skills and project-based experience needed for entry into web design and development careers.
			C02	Use a variety of strategies and tools to create websites.
			C03	Learners shall be able to understand basic concepts and Web Page
				Develop awareness and appreciation of the many ways that people access the web, and will be able to create standards-based websites that can be accessed by the full

				spectrum of web access technologies.
F Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-232 (T)**	**Human Physiology-II**	**C01**	Identify importance of object oriented programming and difference between structured¬ oriented and object oriented programming features.
			C02	Able to make use of objects and classes for developing programs.
			C03	Able to use various object oriented concepts to solve different problems.
F Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT 233 (T)**	**Biochemistry –II**	**C01**	Develop the understanding the fundamentals of modern operating system
			C02	Understand what is an operating system and the role it plays
			C03	
F Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-124 (T)**	**Personal Enhancement**	**C01**	Develop the professional and inter-personal communications and facilitate an all-round enhancement of personality.
			C02	Develop hard or technical skills help securing a basic position in one's life and career.
F Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-125 (P)**	**Practical's in Anatomy-II**	**C01**	Learners shall be able to understand basic concepts and Web Page
			C02	On completion of the course, student will be able to Understand how to develop dynamic and interactive Web Page
F Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-126 P**	**PRACTICAL'S IN HUMAN PHYSIOLOGY-II**	**C01**	Use an integrated development environment to write, compile, run, and test simple object-oriented programs
			C02	Read and make elementary modifications to programs that solve real-world problems.

SEMESTER III				
S Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-231 (T)**	**PATHOLOGY – I**	**C01**	On completion of the course, student will be able to Compare and chose a process model for a software project development.
			C02	Identify requirements analyze and prepare models.
			C03	Prepare the SRS, Design document, Project plan of a given software system.
S Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-232 (T)**	**CLINICAL HAEMATOLOGY-I**	**C01**	On completion of the course, student will be able to Design E-R Model for given requirements and convert the same into database tables.
			C02	Use database techniques such as SQL & PL/SQL..
			C03	Explain transaction Management in relational database System responsible for our performance in life
S Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT 233 (T)**	**MICROBIOLOGY-I**	**C01**	On completion of the course, student will be able to– To access open database through Java programs using JDBC and develop the application
			C02	Understand and Create dynamic web pages, using Servlets and JSP.
			C03	Work with basics of framework to develop secure web applications.
S Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT 234 (T)**	**HISTOPATHOLOGY & HISTOTECHNIQUES-I**	**C01**	distinguish between different mathematical techniques and applications
			C02	equip the quantitative skills that are required to make business decisions.
			C03	formulate and solve decision problems in quantitative terms.
S Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-235 P**	**PRACTICAL CLINICAL HAEMATOLOGY-I**	**C01**	Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs
			C02	Validate input in a Java program.
S Y B.VOC. (MEDICAL	**MLT-236 P**	**PRACTICAL'S IN MICROBIOLOGY-I**	**C01**	To use SQL & PL/SQL

LABORATORY TECHNOLOGY)			**C02**	To perform advanced database operations
SEMESTER IV				
S Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-241 (T)**	**PATHOLOGY-II**	**C01**	Equip the students with skills required in software industry.
			C02	Create a Web form with server controls.
			C03	Use the features of Dot Net Framework along with the features of ASP. NET
S Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-242 (T)**	**CLINICAL HAEMATOLOGY-II**	**C01**	Understand and Create dynamic web pages, using Servlets and JSP.
			C02	Work with basics of framework to develop secure web applications.
S Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-243 (T)**	**MICROBIOLOGY-II**	**C01**	To defend and safety in e commerce. To learn e skills
			C02	To know what is Internet and Extranet
			C03	To know Internet marketing techniques
S Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-244 (T)**	**HISTOPATHOLOGY& HISTOTECHNIQUES-II**	**C01**	Students who complete their postgraduation in economics are mentally equipped to pursue research in the same discipline. It is generally accepted that the research is nothing but the extension and application of knowledge in a certain specialized field.
			C02	Therefore regular and external students who do their post-graduation will be given an opportunity to get exposed to a few elements of social science research.
			C03	Elementary knowledge of research methodology shall consolidate and deepen their understanding of various branches of Economics.
S Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-245 (P)**	**PRACTICAL'S IN CLINICAL HAEMATOLOGY-II**	**C01**	Use the features of Dot Net Framework along with the features of ASP. NET
			C02	Display dynamic data from a data source by using Microsoft ADO.NET and data binding.

S Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-246 P**	**PRACTICAL'S IN MICROBIOLOGY –II**	**C01**	Students will be able to study the different Java components
			C02	Students will be able to learn the different forms of java and php as applicable for effective presentation
SEMESTER V				
T Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-351 (T)**	**IMMUNOHEMATOLOGY & BLOOD BANKING**	**C01**	Understand basics of Mobile application development.
			C02	Develop ability to work in android development environment.
			C03	Design and develop mobile applications
T Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-352 (T)**	**Clinical Enzymology & Automation**	**C01**	The students will be able to understand how server-side programming works on the web.
			C02	The students will be able to use PHP built-in functions and creating custom functions.
			C03	The students will be able to understand POST and GET in form submission.
T Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-353 (T)**	**PARASITOLOGY & VIROLOGY**	**C01**	Learn the techniques needed for providing protection and security to our personal data and information resources
			C02	Experiment and learn the skills to provide protection and security to organizational data and information to build a secured IT infrastructure in the companies.
			C03	To develop high level of professional ethics in providing security in the cyber world.
T Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-354 (T)**	**DIAGNOSTIC CYTOLOGY**	**C01**	Students will be able to understand ERP and learned about different technologies used.
T Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT-355 P**	**PRACTICAL'S IN CLINICAL ENZYMOLOGY**	**C01**	Install and Configure Android Application Development tool.
			C02	Design and Develop user interface for the Android platform.

			C03	Save state information across important operating System events.
T Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	MLT-356 P	PRACTICAL'S IN PARASITOLOGY & VIROLOGY	C01	make dynamic web pages and deploy it over server
			C02	The students will be able to read and process data in a MySQL database.
SEMESTER VI				
T Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	MLT-361 (T)	CLINICAL IMMUNOLOGY	C01	Develop algorithmic solutions to simple computational problems
			C02	Process available data using python libraries and predict outcomes using Machine Learning algorithms to solve given problem.
			C03	Understand programming basics of python programming language
T Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	MLT-362 (T)	CLINICAL ENDOCRINOLOGY& TOXICOLOGY	C01	The students will be able to understand how to receive and process form submission data.
			C02	The students will be able to read and process data in a MySQL database.
			C03	The students will be able to use PHP built-in functions and creating custom functions.
T Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	MLT-363 (T)	DIAGNOSTIC MOLECULAR BIOLOGY	C01	It will help them to implement the knowledge of Digital Marketing in practical by enhancing their skills in the field of Marketing.
			C02	It will help them to gain a solid understanding of the theoretical and conceptual knowledge of international marketing.
			C03	The students will be able to give knowledge about using digital marketing in business
T Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	MLT-364 (T)	Professional Ethics and Values	C01	Students would understand the core values that shape the ethical behavior.
			C02	This course would increase sense of Social Responsibility among students.

			C03	It helps to understand risk and safety measures in personal and professional life.
T Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT 365 (P)**	**PRACTICAL'S IN CLINICAL ENDOCRINOLOGY & TOXICOLOGY**	C01	Process available data using python libraries and predict outcomes using Machine Learning algorithms to solve given problem.
			C02	Able to estimate Machine Learning models efficiency using suitable metrics.
T Y B.VOC. (MEDICAL LABORATORY TECHNOLOGY)	**MLT 366 (P)**	**PRACTICAL'S IN DIAGNOSTIC MOLECULAR BIOLOGY**	C01	The students will be able to use PHP built-in functions and creating custom functions.
			C02	The students will be able to read and process data in a MySQL database.

PROGRAMME SPECIFIC OUTCOMES

Name of the Programme: B. Voc. (MLT)

PSO1	The students will be acquainted to apply knowledge and technical skills associated with medical laboratory technology for delivering quality clinical investigations support.
PSO2	It will also enhance students' performance in routine clinical laboratory procedures within acceptable quality control parameters in hematology, biochemistry, immunohematology and microbiology.
PSO3	Students can apply the fundamentals of research process to complete and present research studies that enrich the field of physical therapy.
PSO4	It can demonstrate technical skills, social behavior and professional awareness for functioning effectively as a laboratory technician.
PSO5	It will enable students to operate and maintain laboratory equipments utilizing appropriate quality control and safety procedures.
PSO6	It will instill to recognize the impact of laboratory tests in a global and environmental context.
PSO7	It will enhance the students' capacity to communicate effectively by oral, written and graphical means.
PSO8	It can develop students as a leader / team member in diverse professional and industrial research areas.
PSO9	Students will be trained in practical to apply problem solving techniques in identification and correction of pre analytical, post analytical & analytical variables.

PSO10	It will instill humanitarian values and foster sympathetic attitude in the students to work in an ethical and professional manner without bias against any ethnicity, race, religion, caste or gender.
PSO11	Students will be trained in practice of professional and ethical responsibilities with high degree of credibility, integrity and social concern.