

PROGRAM OUTCOMES (POs) FOR UNDERGRADUATE COURSES

1. Program: B.A.

After completing the Bachelor of Arts degree, students are able to:

POs	Program Outcomes
PO1	Acquire knowledge with facts and figures related concerned with subjects such as History, Geography, Economics, Languages, etc.
PO2	Identify with the basic concepts, fundamental principles, and various theories in the above mentioned subjects.
PO3	Grasp the importance literature in creating aesthetic, mental, moral, intellectual development of an individual and increasing a healthy society.
PO4	Understand how issues in social science influence literature and how literature can provide solutions to the social issues.
PO5	To gain the analytical ability to analyze critically the literature and social issues, appreciate the strength and suggest the improvements for better results.
PO6	Appreciate that social issues are no longer permanent and largely depend on political, economical changes and also on the developments in science and technology.
PO7	Appear as a multifaceted personality who is self dependant; earning his own bread and butter and also creating opportunities to do so.
PO8	Develop various communication skills such as reading, listing, speaking, etc., which will help in expressing ideas and views clearly and effectively.

2. Program: B.Com.

After completing the Bachelor of Commerce degree, students are able to:

POs	Program Outcomes
PO1	Expose knowledge of major theories and models in key areas of organizational behavior
PO2	Create the self-confidence environment to our students and to offer reliable educational resources that can fill the academic standards and innovations.
PO3	Analyze organizational problems and generate realistic solutions based on current academic research in organizational behavior.
PO4	Demonstrate knowledge of microeconomic theory as it relates to markets, firms, government policy, and resource allocation.
PO5	Demonstrate knowledge of key concepts underlying quantitative decision analysis.
PO6	Apply basic mathematical and statistical skills necessary for analysis of a range of problems in economics, actuarial studies, accounting, marketing, management and finance.
PO7	Demonstrate knowledge of the theories, concepts and findings of the various specializations.
PO8	Develop feasible alternatives and make effective decisions relating to business ethics and social responsibility.

3. Program: B.Sc.

After completing the Bachelor of Science degree, students are able to:

POs	Program Outcomes
PO1	Obtain knowledge with facts and figures related to various subjects in basic sciences such as Physics, Chemistry, Biology, Mathematics, etc.
PO2	Understand the fundamental concepts, principles, and scientific theories related to various scientific phenomena and their relevance in daily life.
PO3	Acquire expertise in handling scientific instruments, planning and performing laboratory experiments nothing losing the observations and drawing logical inferences from them.
PO4	Evaluate the given scientific data critically and systematically and drawing objective conclusions.
PO5	Able to think creatively (divergently and convergent) to propose novel ideas in explaining facts or providing new solution to the problems.
PO6	Develop the scientific outlook not only with respect to science subjects but also in all aspects related to life.
PO7	Absorbe ethical, moral and social values in personal and social life leading to highly cultured and civilized personality.
PO8	Realize the knowledge of subjects in other faculties such as humanities, performing arts, social sciences etc can greatly and effectively influence & inspire in evolving new scientific theories and inventions.

4. Program: B.B.A. (C.A.)

After completing the three year degree in B.B.A. (C.A.), students are able to:

POs	Program Outcomes
PO1	Improve their computer literacy, their basic understanding of operative systems and a working knowledge of software commonly used in academic and professional environments.
PO2	Learn how to organize information efficiently in the forms of outlines, charts, etc. by using appropriate software.
PO3	Use the Systems Analysis Design paradigm to critically analyze a problem.
PO4	Design and implement a web page, develop IT-oriented security issues and protocols.
PO5	Improve communication and business management skills, especially in providing technical support.

PROGRAM OUTCOMES (POs) FOR POST-GRADUATE COURSES

1. Program: M.Sc.

After Completing the Postgraduate degree in **Physics**, students are able to:

POs	Program Outcomes
PO1	Apply theoretical knowledge of principles and concepts of Science to practical problems.
PO2	Use various techniques and interpret the behavior.
PO3	Ability to plan, undertake, and report on a programme of original work.
PO4	Assess the errors involved in an experimental work and make recommendations based on the results in an effective manner.
PO5	Develop communication skills, both written and oral, for specialized and non-specialized audiences.

2. Program: M.Com.

After completing the Masters degree in Commerce, students are able to:

POs	Program Outcomes
PO1	Generate realistic solutions based on current academic research in organizational behavior.
PO2	Demonstrate knowledge of accounting theory as it relates to markets, firms, government policy, and resource allocation.
PO3	Demonstrate knowledge of key concepts underlying quantitative decision analysis.
PO4	Apply basic accounting and statistical skills necessary for analysis of a range of problems in economics, actuarial studies, accounting, marketing, management and finance.
PO5	Demonstrate knowledge of the theories, concepts and findings of the various specializations.

. Program: M.A.

After completing the Masters degree in Arts, students are able to:

POs	Program Outcomes
PO1	Develop various communication skills such as reading, listing, speaking, etc., which will help in expressing ideas and views effectively.
PO2	To gain analytical skill to analyze social issues.
PO3	Acquire knowledge with facts and figures related to that subject.
PO4	Grasp the importance literature in creating aesthetic, mental, moral, intellectual development of an Individual.
PO5	Appear as a multifaceted personality who is self-dependent.

PROGRAM OUTCOMES (POs) FOR Ph.D COURSES

1. Program: Ph.D

After Completing the Ph.D, students are able to:

POs	Program Outcomes
PO1	Critically apply theories, methodologies and Knowledge to address fundamental questions in their primary area of study.(Research, Critical Thinking, Content knowledge)
PO2	Pursue research of significance in the disciplinary or interdisciplinary or creative project.
PO3	Inculcating and developing research mind in the society to overcome their basic problems.
PO4	Demonstrate skills in oral and written communication, sufficient to publish and present work in their field.
PO5	Guiding and motivating students for doing the basic research in their local area.
PO6	Follow the principles of ethics in their field and in the academics.
PO7	Interact productively with people from diverse background as both leader and team.

PROGRAM SPECIFIC OUTCOMES (PSOs) FOR UNDERGRADUATE COURSES

1. Program: B.A. (English)

PSOs	Program Specific Outcomes
PSO1	Understand the importance of English as international language.
PSO2	Develop the literary test of students and encourage them for creative writing.
PSO3	Analyze the basic problems of students in communications skills.
PSO4	Enrich the critical analysis and linguistic sensibility of the students

2. Program: B.A. (Hindi)

PSOs	Program Specific Outcomes
PSO1	Student learns communicate effectively in the Hindi language.
PSO2	Language difficulties in the skills of listening, reading, writing, speaking can be understood and solved.
PSO3	Analyze the basic problems of students in communications skills in Hindi language.
PSO4	Students will write a compare and contrast paragraph using vocabulary associated with the language function.

3. Program: B.A. (Marathi)

PSOs	Program Specific Outcomes
PSO1	Students will understand the social customs and codes through Marathi literature.
PSO2	Students will be aware of impact of various factors on Marathi literature.
PSO3	Students can understand that moral values reflected in Marathi literature
PSO4	Students can go for higher studies and post graduate courses in Marathi language

4. Program: B.A. (Economics)

PSOs	Program Specific Outcomes
PSO1	Understand the nature and basic concepts of Micro Economics, Macro Economics.
PSO2	Development, Planning, Budget, international trade.
PSO3	Analyze and compare various market situations.
PSO4	Analyze Economic problems of various sectors in the Economy.
PSO5	Understand the applications of economic concepts, theories and policies

5. Program: B.A. (History)

PSOs	Program Specific Outcomes
PSO1	Understand the nature and basic concepts of History of Chh. Shivaji & His Times, Modern India, Ancient India, Medieval India.
PSO2	History of The World In 20TH Century.
PSO3	Introduction To History, History of Asia In 20TH Century.

6. Program: B.A. (Geography)

PSOs	Program Specific Outcomes
PSO1	Students can understand the fundamental concepts and nature of various branches of Physical and Human Geography.
PSO2	The program enables students to understand the man-nature relationship and associated social and environmental problems.
PSO3	Surveying and field observations creates awareness about the environment and develops consciousness to protect the same.
PSO4	Capable to physically survey and map any land domain.
PSO5	Knowledge of geographical and climatic maps, students can effectively interpret the regional physical, cultural and climatic features.
PSO6	Knowledge of Geography enhances ability to identify vulnerable zones of various natural and man-made hazards.

7. Program: B.A. (Political Science)

PSOs	Program Specific Outcomes
PSO1	Understanding of how political institutions, processes, laws, and ideas combine to influence policy and political outcomes.
PSO2	Understanding of transnational conflict and collaboration and their impacts on policymaking.
PSO3	Understanding of the conflicts between politics and ethics in contemporary pluralistic and bureaucratic environments.
PSO4	Understanding of the reciprocal influences between culture and politics, with particular emphasis on an understanding of the symbolic and material impacts of culture on policymaking.
PSO5	Knowledge of how to conduct quantitative and qualitative research to address political issues and problems.

8. Program: B.A. (Psychology)

PSOs	Program Specific Outcomes
PSO1	Understand basic concepts, principles and theories of Psychology.
PSO2	Accomplish to understand the basic steps in scientific research and psychology.
PSO3	Understand recent clarification, the causes, symptoms and treatment of various Psychological disorders.
PSO4	Knowledge of psychological testing, its administration, scoring and interpretation.
PSO5	Undertake an independent small-scale research projects or projects related with social works.

10. Program: B.Com

PSOs	Program Specific Outcomes
PSO1	Able to acquire basic and fundamental knowledge and skills for doing business and commercial activities of their choice.
PSO2	Empowers the students to choose a profession of their choice such as CA, CS, ICWA, MBA, M.Com etc
PSO3	Acquire the accounting knowledge, management principles, retail trading, banking and insurance transactions, business economics and financial management
PSO4	Acquire knowledge in the field of management accounting, corporate accounting, statistical and mathematical techniques and knowledge relating to corporate law and business laws
PSO5	Develop and capable of doing a business of their choice or choosing a profession or can become employees having basic knowledge and skill required for such activities.

11. Program: B.Sc. (Physics)

PSOs	Program Specific Outcomes
PSO1	Understanding of core knowledge on various papers of Physics. Clear the concepts which help them in understanding physical phenomenon in nature.
PSO2	Demonstrate skills and competencies to conduct scientific experiments related to Physics.
PSO3	Identify their area of interest and further specialize in the Physics.
PSO4	Analyze situations, search for truth and extract information, formulate and solve problems in a systematic and logical manner.
PSO5	Possess advanced knowledge and skills in job market for various technical industries.

12. Program: B.Sc. (Chemistry)

PSOs	Program Specific Outcomes
PSO1	Develop abilities to apply the knowledge of contents of principles of Chemistry.
PSO2	Develop the power of appreciation, the achievements in Chemistry and its role in nature as well as in the social order
PSO3	Able to handle instruments for basic and modern chemical analysis.
PSO4	Safe-handling of chemical materials, taking into account their physical and chemical properties including any specific hazards associated with their use and the ability to conduct risk assessments
PSO5	Students followed and understood general laboratory practice guidelines, including safety
PSO6	Evaluation, interpretation and synthesis of chemical information and data

13. Program: B.Sc. (Mathematics)

PSOs	Program Specific Outcomes
PSO1	Enrich students' knowledge and train them in the mathematics.
PSO2	Students can learn integration through infinite sum.
PSO3	Know the concepts, methods of solution & classification in mathematics.
PSO4	Student's build-up a progressive and successful career in Mathematics.
PSO5	Students will be trained in problem solving, carrying out calculations faster, perfection in skills.
PSO6	Know the calculus of function of several variables, applications of double & triple integration.
PSO7	Improve logical thinking, the techniques to solve the problems.

14. Program: B.Sc. (Electronics)

PSOs	Program Specific Outcomes
PSO1	Analyze, plan and apply the acquired knowledge in basic sciences in solving Electronics and Communication problems.
PSO2	Apply EDA tools to design linear and digital IC systems.
PSO3	Design, build and test analog & digital electronic systems for given specifications.
PSO4	Architect modern communication systems to meet stated requirements.
PSO5	Communicate effectively, demonstrate leadership qualities and exhibit professional conduct in their career.
PSO6	Specify, design and test power supplies for electronic systems including battery management, and power amplifiers.
PSO7	Analyze and design noise-free analog and digital communication systems.

15. Program: B.Sc. (Statistics)

PSOs	Program Specific Outcomes
PSO1	Develop an understanding of various statistical tools, techniques and software.
PSO2	Apply critical and contextual approaches across wide variety of subject matter.
PSO3	Develop logical thinking to comprehend key facts leading to formulation of the solution process.
PSO4	Develop self-confidence and awareness of general issues prevailing in the society.
PSO5	Integrate knowledge, skill and attitude that will sustain an environment of learning and creativity.

16. Program: B.Sc. (Zoology)

PSOs	Program Specific Outcomes
PSO1	Acquire the knowledge of animal science, natural phenomenon, and manipulation of nature and environment by man.
PSO2	Understanding the scientific terms, concepts, facts, phenomenon and their interrelationship.
PSO3	Students followed and understood general laboratory practice guidelines, including safety
PSO4	Develop scientific attitude which is the major objective this makes the students open minded, critical observations, curiosity, thinking etc.
PSO5	Abilities to apply scientific methods, collection of scientific data, problem solving.

. Program: M.Sc. (Analytical Chemistry)

PSOs	Program Specific Outcomes
PSO1	Develop generic skills for employment or further training in R&D, science based industry and establishments, education, and for training at management levels in other professions.
PSO2	Develop interpersonal skills, relating to the ability to interact with other people and to engage in team working.
PSO3	Develop powers of critical analysis and ability to solve problems.
PSO4	Understand the instrumental method of analysis like AAS, FES, GC, HPLC, TGA, DTA etc
PSO5	Understand the official method of standardization and quality control.
PSO6	Understand the data handling and knowing accuracy, precision, Standard deviation and regression etc.
PSO7	Know the broad and in depth understanding of ideas central to chemistry.

Program: M.Sc. (Organic Chemistry)

After Completing the Masters degree in Organic Chemistry, students are able to:

POs	Program Outcomes
PO1	Get basic knowledge in Organic Chemistry.
PO2	To be qualified for training as scientific researcher.
PO3	Develop knowledge of scientific theories and methods, gain experience in working independently with scientific questions and clearly express their opinion on academic issues.
PO4	Develop communication skills, both written and oral, for specialized and non-specialized audiences.
PO5	Observe specific phenomena experimentally & understand new applications of research in organic Chemistry.

Program: M.Sc. (Physics)

POs	Program Outcomes
PO1	Apply theoretical knowledge of principles and concepts of Physics to practical problems.
PO2	Use mathematical techniques and interpret mathematical models of physical behavior.
PO3	Demonstrate the ability to plan, undertake, and report on a programme of original work; including the planning and execution of experiments, the analysis and interpretation of experimental results.
PO4	Assess the errors involved in an experimental work and make recommendations based on the results in an effective manner.

PO5	Develop communication skills, both written and oral, for specialized and non-specialized audiences.
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Program: M.Sc. (Zoology)

PSOs	Program Specific Outcomes
PSO1	Understand the nature and basic concepts of cell biology, Animal physiology, Histology, Parasitology and Animal Diversity, Biochemistry, Taxonomy and Environmental Biology.
PSO2	Understand the relationship among animal, environment and plants and Animal physiology.
PSO3	Implementation of the procedures as per laboratory standards in the areas of Biochemical Techniques, Biochemistry, Genetics and Molecular Biology
PSO4	Understand the applications of biological sciences in Medical field, Agricultural field, Pharmaceutical Industries, Biotechnology and in food industries.

Program: Ph.D(Physics)

PSOs	Program Specific Outcomes
PSO1	To understand principles of physics and apply it to solve problem.
PSO2	Developing easy tools and skills while handling instrument such as FTIR, UV-VIS spectrometer, Spin coating machine, KBr Hydraulic Press, LCR meter, Keithley meter, Gas sensing kits etc.
PSO3	Develop powers of critical analysis and ability to solve problems.
PSO4	Making of prototypes while pursuing research. Monitoring and Mentoring hands on trainings on various instruments and tools used for characterization of different research material.

Course Outcomes (COs) for ARTS FACULTY

Department of English

Class	Course	Course outcome
F.Y.B.A. (Annual)	Compulsory English Visionary Gleams	CO ₁ . Development of literary and linguistic test of the newly admitted students.
		CO ₂ . Improvement of communication skills in English
		CO ₃ . Enrichment of Grammatical sense and writing skills.
		CO ₄ . Developing an ability for dialogue and group discussion.
	Optional English	CO ₁ .Development of liking for English literature
		CO ₂ .Clear understanding of the aims and objectives of course
		CO ₃ .Knowledge of the basic function of Literary Language.
	Functional English Paper I	CO 1. Organs of Speech
		CO 2. Learning Grammar
		CO ₃ . Words, Accent, sentences and weakforms
	Functional English Paper II	CO ₁ . Introducing oneself and others
		CO ₂ . Describing objects and narration skills
		CO ₃ Reading dialogues with proper accents
		CO ₄ . Presentation on given topics
S.Y.B.A. (Annual)	Compulsory English Literary Landscape	CO 1Strengthening the literary and linguistic test of the students.
		CO 2.Improvement of communication skills in English
		CO 3. Enrichment of Grammatical sense and reading skills.
		CO 4. Ability of group discussion and oral presentation
	Special English Paper I	CO 1. Introduction of elements of drama.
		CO 2. Development of students' liking for the stage.
		CO 3. Enhancement of the sense of technique of characterization.
		CO 4. Improvement of stage daring of the students.
	General English Paper II	
		CO 1. Familiarizing the students with the minor form of literature .
		CO 2. Introduction of short story as Genre of Literature.

		CO 3. Familiarizing with the basics of English Language.
		CO 4. Awareness of phenomena of world English.
	Functional English Paper III	CO1. Vocabulary, prefix and suffix
		CO2. Elaboration of concepts
		CO3. Different types of Report
		CO4 language used for Radio and TV programs
	Functional English Paper IV	CO1. Verbal and Non-verbal Communication
		CO 2. Reading Newspaper, situational conversations
		CO3. Group Discussion and group activities
		CO4. Interview skills
T.Y.B.A. (Annual)	Compulsory English	CO 1. Improvement of speaking skills in English.
		CO 2. Enrichment of the Grammatical sense and news reporting.
		CO 3. Skills for compering and rapid reading.
		CO 4. Perfection of the use of idioms and phrases
	Special English Paper III	CO.1. Introduction of the novel as genre of literature
		CO2. Sensitization of the element of fiction
		CO.3. Knowledge of the novels
		CO.4.Introduction to the critical analysis of prose passages
	Special English Paper IV	CO.1.Enrichment of critical views of the students
		CO.2.Development of broad views in students about various approaches
		CO.3. Study of the interpretation of various critics

		CO.4.Knowledge of different critical terms
	General English Paper III	CO.1.Enrichment of competence in English
		CO.2.Introduction of clauses and phrases
		CO.3.Illustration of pragmatics
		CO.4. Development of the poetry writing skill
	Functional English Paper V	CO1. Acquainting students to new career options
		CO2. Various career in Language
		CO3. Creating awareness about language changes from one media to the other
		CO4. Language activities of media through exposure
		CO5. To impart translation skills related to media
	Functional English Paper VI	CO1. Possibilities of self-employment
		CO2. Provide basic sources of information regarding SSI
		CO3. Idea of self-employment through field work, study reports and interviews
		CO4. Overall personality development through key competency modules
		CO5. Create possibility of focused writing
Departement of Hindi		
F.Y.B.A. (Annual)	Hindi Samanya-1 (Hindi General 1)	
		1. छात्रों को हिंदी गद्य और पद्य साहित्यकारों से परिचित कराना।
		2. छात्रों में राष्ट्रीय भावना का विकास करना।
		3. छात्रों की निचार क्षमता और कल्पना को बढ़ाना देना।
		4. साहित्यिक भाषा प्रयोग से छात्रों को अवगत कराना।
		5. छात्रों में भाषा और साहित्य के प्रति प्रेम निर्माण करना।
S.Y.B.A. (Annual)	Hindi Samanya 2 (Hindi General 2)	
		1. छात्रों को हिंदी के प्रातिनिधिक कहानीकारों से परिचित कराना।
		2. छात्रों को हिंदी के प्रातिनिधिक कवियों से परिचित कराना।
		3. छात्रों को कार्यालयीन हिंदी से अवगत कराना ।
		4. भाषा के सूक्ष्म अध्ययन पर बल देना।
		5. छात्रों को अवांतर पठन के लिए प्रेरित करना।
	Hindi vishes 1 (Hindi Special 1)	

		1. छात्रों को हिंदी भाषा एवं भाषा विज्ञान से अवगत कराना।
		2. छात्रों को हिंदी की बोलियों से परिचित कराना।
		3. हिंदी के शब्द भंडार, लिपि आदि का परिचय देना।
		4. उच्चारण अवयवों का परिचय देना।
		5. छात्रों को भाषा के विविध रूपों से परिचित कराना।
	Hindi vishes 2 (Hindi Special 2)	1. छात्रों को हिंदी हिंदी के मध्ययुगीन साहित्य से परिचित कराना।
		2. छात्रों को हिंदी नाटक और उपन्यास विधा से परिचित कराना।
		3. हिंदी के आधुनिक साहित्य का परिचय देना।
		4. छात्रों में साहित्य के आस्वाद की क्षमता पैदा करना।
		5. छात्रों की भाषा क्षमता और विचार क्षमता को बढ़ावा देना।
T.Y.B.A. (Annual)	Hindi Samanya 3 (Hindi General 3)	1. छात्रों को हिंदी के आत्मकथा साहित्य से परिचित कराना।
		2. छात्रों को साहित्य की निर्माण प्रक्रिया से परिचित कराना।
		3. हिंदी भाषा के कार्यालयीन उपयोग से अवगत कराना।
		4. खंडकाव्य विधा से परिचित कराना।
		5. छात्रों में आलोचक की दृष्टि पैदा करना।
	Hindi vishes 3 (Hindi Special 3)	1. छात्रों को हिंदी साहित्य के इतिहास से अवगत कराना।
		2. छात्रों को हिंदी के विविध साहित्यकारों से परिचित कराना।
		3. प्रसिद्ध रचनाओं से छात्रों को अवगत कराना।

4. साहित्य और समीक्षा लेखन की ओर छात्रों की रुचि पैदा करना।
5. साहित्य का महत्व आत्मसात करना।

1. छात्रों को काव्यशास्त्र से अवगत कराना।
2. संस्कृत, हिंदी और अंग्रेजी के साहित्य सिद्धांतों से परिचित कराना।
3. अलंकार और छंदों का ज्ञान कराना।
4. साहित्य रचना की प्रक्रिया से छात्रों की अवगत कराना।
5. समीक्षा कर्म का महत्व एवं दायित्व स्पष्ट करना।

1. छात्रों को गद्य और पद्य साहित्य से परिचित कराना।
2. छात्रों में राष्ट्रीय भावना का विकास कराना।
3. छात्रों की विचार क्षमता और कल्पना को बढ़ावा देना।
4. साहित्यीय भाषा प्रयोग से छात्रों को अवगत कराना।
5. छात्रों में हिंदी भाषा और साहित्य के प्रति प्रेम निर्माण कराना।

- आधुनिक मराठी वाङ्मय (१०२४)**
१. सामान्यतर जी.ए. १, २ आणि ३ पर्यंतच्या सामान्य स्तरावरील मराठी या विषयाचा अभ्यास करणे—या विद्यार्थ्यांना स्फुरण देणे मराठी साहित्य, मराठी भाषा आणि मराठी संस्कृती यांचा कसला परिचय करून देणे.
 २. साहित्यसंश्लेषी — विरोधन: मराठी साहित्यसंश्लेषी रुची निर्माण करणे
 ३. विद्यार्थ्यांच्या वाङ्मयीन अभिरुचीचा विकास करणे
 ४. आस्वाद घेण्यासाठी टीळरा क्षमता विकसित करणे
 ५. साहित्यसंश्लेषातून जीवनविषयक समज विकसित करणे
 ६. मराठी साहित्यातील भिन्न भिन्न प्रवाह आणि प्रकार लक्षात घेणे
 ७. जागतिकीकरणाने विविध क्षेत्रांना सामोरे जाण्यासाठी भाषिक क्षमता विकसित करणे
 ८. व्यक्तिमत्त्व विकासात भाषेचे महत्व स्पष्ट करणे.

- आधुनिक मराठी साहित्य आणि उपरोक्त मराठी (२०२७)**
१. शुब्दलेखनाची ओळख करून देणे
 २. पारिभाषिक संज्ञांची ओळख करून देणे
 ३. चरित्र आत्मचरित्र या साहित्यप्रकारांच्या तात्विक घटकांचे ज्ञान करून देणे
 ४. आधुनिक मराठी साहित्यातील निवडक चरित्र आत्मचरित्रात्मक लेखांचे आकलन, आस्वाद आणि मूल्यमापन करण्याची क्षमता विद्यार्थ्यांमध्ये निर्माण करणे

- मराठी साहित्यातील विविध साहित्यप्रकार (२०२८)**
१. मराठी साहित्यप्रकारांच्या तात्विक घटकांचे ज्ञान घेणे.
 २. वेगवेगळ्या काळखंडातील मराठीतील अभिजात साहित्यकृतींचा संस्कार घडविणे. साहित्यविषयाची अभिरुची निर्माण करणे.
 ३. साहित्यकृतीला मुक्त प्रतिवाद देण्याची क्षमता विकसित करणे
 ४. साहित्याचा शुद्ध पातळीवर अभ्यास करण्याची क्षमता विकसित करणे
 ५. पदव्युत्तर अभ्यास करण्याची परतपायी करणे.

[illegible]

आवांवीन मराठी वाङ्मयाचा इतिहास (इ.स.१८८० ते १९६०) (२०३)	१. जिवनसंवादावर आत्मचरित्राचा आलेख काय करताना? तसेच साहित्यिक मूल्यमापन परंपरेचे स्थूल ज्ञान करून घेणे.
	२. विशिष्ट कलेखंडाच्या चार्जभूमीवर साहित्यामागील प्रेरणा प्रवृत्तीचे ज्ञान करून घेणे.
	३. साहित्यप्रकारांच्या विकसनशील परंपरेचे स्थूल ज्ञान करून घेणे.
	४. बदलवृत्तीवर अभ्यास करण्याची पूर्वतयारी करणे.
आधुनिक मराठी साहित्य आणि व्यावहारिक व उपेक्षित मराठी	१. आधुनिक मराठी साहित्यातील विविध साहित्य प्रकारांचा परिचय वाढविणे. त्याचे आकलन करून घेणे. साहित्यसावदलची अभिरुची विकसित करून कलाकृतींचा आस्वाद घेण्याची क्षमता वाढविणे.

२. नेमलेल्या कलाकृतींच्या संदर्भात साहित्यपरंपरेचा स्थूल परिचय करून घेणे.
३. भाषेचे यथोचित आकलन करण्याची व वापर करण्याची यथायोग्य क्षमता विकसित करणे.
४. 'निबंध' व प्रवारावर्णन या साहित्यप्रकारांचे तात्विक विवेचन करणे.
५. विद्याध्यायीची वाचन व लेखन क्षमता विकसित करून त्यांना गंधपरीक्षांची आवड निर्माण व्हावी, यासाठी प्रयत्न करणे.

१. साहित्याचे स्वरूप समजावून घेणे
२. साहित्याचे प्रयोजने समजावून घेणे
३. साहित्यनिर्मितीची प्रक्रिया समजावून घेणे
४. साहित्याची भाषा समजावून घेणे
५. साहित्याची आस्वाद प्रक्रिया समजावून घेणे
६. साहित्यिक अभिरुची समजावून घेणे
७. साहित्य आणि समाज यातील परस्परसंबंध समजावून घेणे
८. साहित्यप्रकारांची संकल्पना समजावून घेणे
९. वाङ्मयीन मूल्य समजावून घेणे

भाषाविज्ञान— वर्णनात्मक आणि ऐतिहासिक (३०३१) . भाषेचे स्वरूप व कार्य भाषेच्या अभ्यासाचे महत्त्व, भाषेच्या अभ्यासाची प्रमुख अंगे जाणून घेणे.

२. भाषा म्हणजे काय व तिचे मानवी जीवनातील कार्य व महत्त्व जाणून घेणे
३. वेगवेगळ्या भाषाअभ्यासधर्तीचे वेगळेपण व महत्त्व जाणून घेणे
४. रचनेनिर्मितीची प्रक्रिया समजावून घेणे.
५. वर्णद्विधाची रचना व कार्य समजावून घेणे
६. रचनेविज्ञान, रचनेम संकल्पना आणि मराठीची रचनेम व्यवस्था जाणून घेणे
७. मराठीची रूपमव्यवस्था समजावून घेणे
८. वाक्यविन्यास व अर्थविन्यास या भाषावैज्ञानिक संकल्पनांचा मराठीच्या संदर्भात स्थूल परिचय
९. ऐतिहासिक भाषाभ्यासपद्धतीचे स्वरूप व महत्त्व लक्षात घेणे.
१०. भाषाकुलाची संकल्पना जाणून घेवून मराठी भाषेच्या उत्पत्तीचा अभ्यास करणे.
११. मराठी भाषेचा उत्पत्तीकाल जाणून घेवून तत्कालीन भाषिक स्थित्यांचा आढावा घेणे.

F.Y.B.com	'यशोगाथा' पाठ्यपुस्तक आणि व्यावहारिक मराठी उपयोजित मराठी	<p>१.२. तय्यातय्याने भाषा म्हणून मराठीच्या तादब्बालीचा ऐतिहासिक आढावा घेणे.</p> <p>३. वाणिज्य विद्याशाखेच्या विद्यार्थ्यांना मराठीच्या व्यवहारक्षेत्राची माहिती देणे. विविध क्षेत्रातील भाषा व्यवहाराचे स्वरूप गरज समजावून देणे.</p> <p>२. या व्यवहार क्षेत्रातील मराठी भाषेचे स्थान स्पष्ट करणे व त्यातील मराठीच्या प्रत्यक्ष वापराचा अभ्यास करणे.</p> <p>३. विविध क्षेत्रातील मराठीचा अभ्यास करण्यासाठी प्रसारमाध्यमाचे स्वरूप व त्यातील भाषा व्यवहार समजावून देणे.</p> <p>४. प्रसारमाध्यमातील विविध लेखन प्रकारांचा अभ्यास व प्रत्यक्ष लेखन</p> <p>५. राजभाषा मराठीचे स्थान, कार्यालयीन भाषेचे स्वरूप, मराठीतून लेखन करताना येणा-या अडचणी, कार्यालयीन भाषेची तसे व कौशल्ये, अर्थकारण व वाणिज्य विषय मराठीतून परिणामकारकरित्या मांडता यावा यासाठी कौशल्यांची आवश्यकता आहे. मराठीत आजवर या दिशेने कोणते प्रयत्न झालेले याची माहिती विद्यार्थ्यांना देणे आवश्यक आहे.</p>
	मराठी विज्ञानसाहित्य आणि व्यावहारिक मराठी	<p>विद्यार्थ्यांमध्ये मराठी विज्ञानसाहित्य विषयी आवड निर्माण करणे.</p> <p>२. विद्यार्थ्यांमध्ये वैज्ञानिक जाणिव्हा निर्माण करून देणे.</p> <p>३. विद्यार्थ्यांमध्ये विज्ञान, उद्योगातील विविध प्रवाह, रांघी यांचा परिचय करून देणे.</p> <p>४. विद्यार्थ्यांमध्ये लेखन, वाचन, आकलन आणि संभाषण ही भाषिक कौशल्ये अधिकाधिक विकसित करणे.</p> <p>५. भाषिक कौशल्याचे विविध अविष्कार आणि प्रसारमाध्यमे यांच्या परस्परसंबंधाचे ज्ञान विद्यार्थ्यांना करून देणे.</p> <p>६. वैज्ञानिक, कार्यालयीन, व्यवसायिक आदी कामकाजात मराठीच्या होणा-या वापराची माहिती देत पारिभाषिक संज्ञांची ओळख विद्यार्थ्यांना करून देणे.</p>
F.Y. B.Com	Bus.Math.& Stat.	CO1 To prepare for competitive exam.
		CO2 To understand the concept of EMI
		CO3 To understand the concept of population and sample.
S.Y.B.com	Marketing Management(Spl-1)	CO1 To orient the students recent trends management.
		CO2 To acquaint the students with the use of e-commerce in competitive environment.
		CO3 To calculate knowledge of various aspects of marketing management through practical approach.
S.Y .B.com	Business communication	CO1 Understand the concept, process and IMP of business communication.
		CO2 Understand the channels and methods of communication.
		CO3 Learnt the various soft skills.
T.Y.B.com	Auditing (Sem-1)	CO1 Understand the concept of auditing
		CO2 Learnt the process of auditing.
		CO3 To know the concept of tax audit.
T.Y.B.com	Advance Accounting	CO1 To know the basic of accounting standards.
		CO2 To know the band final account and its uses in banking co.

		CO3 To know the insurance claim accounting & its types.
T.Y.B.com	Cost and works accounting	CO1 To know the basic of marginal costing.
		CO2 To know the cash budget and flexible budget.
		CO3 To know the standard costing and variances.
T.Y.B.com	Marketing management(Spl-3)	CO1 To know the detailing of marketing research.
		CO2To understand the role brand and distribution.
		CO3To inform about Marketing and economic development.
M.Com-I(Sem-I)	Advanced accounting and taxation	CO1 To lay a theoretical foundation of account
		CO2 To study a theoretical foundation of accounting and accounting standards.
		CO3 To gain ability to solve problems relating to company accounts.
M.Com-I(Sem-II)	Advanced accounting and taxation	CO1 To develop competency of student to solve problems relating special areas in account.
		CO2 To understanding of financial reporting practices.
		CO3 To familiarize the student with procedure of accounting for taxation.
M.Com-I	Income tax	CO1 To know the computation of income under salaries.
		CO2 To know the computation of business and profession.
		CO3To study and understand computation of taxable income.
M.Com-I	Business tax assessment and planning	CO1 To know the assessment of companies & co-operative society.
		CO2 To know the tax planning.
		CO3 To know the GST and its applications.
M.Com -II	Capital market and financial services	CO-1 Understand the concept of Capital market.
		CO2 To learn the process of stock market.
		CO3 To learn the financial services of co-operative sector.
M.C.om- II	Specialized areas in auditing	CO1 To know the audit under tax laws is going on.
		CO2 To know and understand internal audit.
		CO3 To know audit of co-curative societies.
M.Com-II	Advanced auditing	CO1 To know the basic concepts of auditing.
		CO2To know the IFRS & standards.
		CO3 To know the audit under CIS Environment.
M.Com-II	Recent advances in accounting, taxation and auditing	CO1 To know about IFRS and listing agreement clause-49
		CO2 To know environmental accounting and forensic accounting.
		CO3 To know lean and responsibility accounting.

Department of Economics		
F.Y.B.A. (Annual)	Indian Economy Prospects and Problems(G-I)	CO.1.Understanding problems of various sectors of Indian economy, Developmentconcept's & prospects of Indian economy
		CO.2. students can describe and compare Indian economy and developed economies.
S.Y.B.A. (Annual)	Modern Banking(G-II)	CO.1 students can understand and ,analyze. Functioning of the economy.
		CO.2. students can understand basic concept of Macro Economics and application
		CO.3. Analyze macroeconomic policies including fiscal and monetary policies
		CO.4. Determine economic variables including inflation, unemployment, poverty, GDP, Balance of Payments using
		macro economic theories.
	Micro Economics (S-I)	CO.1.Students can analyze various market conditions.

		CO.2. Students can compare various market situations.
		CO.3. students can understand ,analyze various Micro Economic problems and polices.
		CO.4. Understanding of the behavior of financial and money markets and perform costbenefit analysis for making investment decisions.
	Macro Economics (S-II)	CO.1 Students can understand and ,analyze. Functioning of the economy.
		CO.2. Students can understand basic concept of Macro Economics and application
		CO.3. Analyze macroeconomic policies including fiscal and monetary policies
		CO.4. Determine economic variables including inflation, unemployment, poverty, GDP, macro economic theories of India
T.Y.B.A. (Annual)	Economic Development & Planning(G-III)	CO.1. Enable students to understand indicators of economic development, it's constraints, development Theories & approaches , need of planning
	International Economics(S-III)	CO.1. This course provides the students a thorough understanding and deep knowledge about the basicprinciplesthat governthe free flow of trade in goods and services at the global level. tend to
		CO.2. Students will able to understand and describe various modules, lay stress both on theory and applied nature of the subject that have registered rapid changes during the last decade .
		CO.3. Knowledge of the impact of free trade and tariffs on the different sectors of the economy as well as at the macro level.
		CO.4. Training about the rationale of recent changes in the export import policies of India.
		CO.5. students can describe and compair policy point of view under the present waves of globalization and liberalization .
		CO.6. The students would also be well trained about the rationale of recent changes in the export import policies of India.
	Public Finance(S-IV)	CO.1.Students will able to understand and describe Meaning, Nature, Scope and Importance of Public Finance
		CO.2. Enable student's to identify Causes of increase in Public Expenditure and Effects of Public Expenditure
		CO.3.Students can analyze Indian Tax structure .

Department of History

F.Y.B.A. (Annual)	CHH. SHIVAJI AND HIS TIMES (1630 - 1707) (G-I)	CO.1. Enable the students to understand the study of History of Maratha to make it value based, conceptual and thought provocative.
		CO.2. Introduction to the International elements in the study of Marathas to facilitate comparative analysis of this history.
		CO.3. Highlighting the importance of past in exploration of present context. Understanding of the Socio –economic, cultural and political background of 17th century Maharashtra.
		CO.4. Development of spirit of healthy Nationalism & Secularism among the student.
		CO.5. Encouragement of students to for competitive examinations.
S.Y.B.A. (Annual)	MODERN INDIA (1850-1950) (G-II)	CO.1. Enable students to understand the History of freedom movement of India, aims, objectives problems and progress of Independent India.
		CO.2. Enabling the student to understand the processes of rise of modern India.
		CO.3. Knowledge of the basic concepts/ concerns/ frame work of Indian History.
	ANCIENT INDIA (3000 BC - 1206 AD) (S-I)	CO.1. Enable students to understand the social, economic, religious and institutional bases of Ancient India.
		CO.2. Students can understand agricultural concepts.
		CO.3. Students can understand industry, trade.
		CO.4. Development of the concept of Nation- State background of political history. And ancient Indian Art & Architecture.
	MEDIEVAL INDIA (1206 - 1707) (S-II)	CO.1 students can understand the sources of History of medieval India.
		CO.2. The course intends to provide an understanding of the social, economic, religious bases of medieval India.

		CO.3. Knowledge medieval Indian art & architecture.
T.Y.B.A. (Annual)	HISTORY OF THE WORLD	CO.1. Enable students to understand Modern World, acquaint the student with the Socio-economic & Political
	IN 20TH CENTURY (1914 - 1992) (G-III)	Developments in other countries. And understand the contemporary world in the light of its background History.
		CO.2. Orientation of the students with political history of Modern World.
		CO.3. Knowledge about the main developments in the Contemporary World
		CO.4. Impart knowledge about world concepts.
		CO.5. Understanding of the economic transition in World during the 20th Century.
		CO.6. Become aware of the principles, forces, processes and problems of the recent times.
		CO.7. Knowledge regarding growth of various political movements that shaped the modern world.
		CO. 8. Highlighting the rise and growth of nationalism as a movement in different parts of the world.
	INTRODUCTION TO HISTORY (S-III)	CO.1. Orientation of the students about how history is studied, written and understood.
		CO.2. Explanation of methods and tools of data collection.
		CO. 3.Understanding the meaning of Evolution of Historiography.
		CO.4. Knowledge of Various Views of Historiography.
		CO.5. Knowledge of the approaches to Historiography.
		CO.6. Knowledge of the types of Indian Historiography.
		CO.7. Ability to describe importance of inter-disciplinary research.
		CO.8. Introduction of the basics of research.
		CO.9. Knowledge of the recent research in History.
		CO.10. Learn how to use sources in their presentation.
	HISTORY OF ASIA IN 20TH	CO.1. Orienting the students with political history of Asia.
	CENTURY (1914– 1992) (S-IV)	CO.2. Enabling the students to understand the economic transition in Asia during 20th Centuries.
		CO.3. Understanding the important developments in the 20th century Asia in a Thematic approach.
		CO.4. Providing an overall view and broad perspective different movements connected with Nationalist aspirations in the region of Asia in general.
		CO.5. Empowering the students to cope with the challenges of globalization.
Department of Geography		
F.Y.B.A. (Annual)	G-1.Gg-110 Elements of Geomorphology	CO.1 Introduction to the shape, size and interior structure of the earth.

		CO.2 Introduction to the basic theories on origin of continent and ocean basins.
		CO.3 Study of internal and external movements and forces (agents) and their resultant landforms.
		CO.4 Applied study of concepts and theories in Geomorphology in various human activities, environmental hazard assessment and watershed management.
S.Y.B.A. (Annual)	G-2 Gg-210 Geography of Disaster	CO.1 Introduction to the basic concepts in disaster management system and classification of disasters.
	Management	CO.2 Study of various components of disaster management such as Preparedness, Response, Recovery,

		Mitigation and Rehabilitation.
		CO.3 Study of causes and consequences of various climatic, geological, geomorphic and atmospheric disasters.
		CO.4 Introduction to the global issues with causative and controlling factors of these issues.
		OR
	G-2 Gg-210 Element of	CO.1. Knowledge of the basic principles and concepts in Climatology and Oceanography.
	Climatology and	CO.2. Knowledge of the applications of Climatology and Oceanography in different areas and environment.
	Oceanography	CO.3. Awareness of the Planet Earth and thereby to enrich the student's knowledge.
	S-1 Gg-220 Economic	CO.1. Introduction of the basic principles and concepts in Economic Geography
	Geography	CO.2. Knowledge of the applications of Economic Geography in different areas and development.
		CO.3. Integration of the various factors of economic development and to acquaint the students about this dynamic aspect of economic geography.
		OR
	S-1 Gg-220 Tourism Geography	CO.1. Introduction about the basic principles and concepts in Economic Geography
		CO.2. Knowledge and the applications of Economic Geography in different areas and development.
		CO.3. Integration of the various factors of economic development and to acquaint the students about this dynamic aspect of economic geography.
	S-2 Gg-201 Fundamentals	CO.1. Enabling the students to use various Projections and Cartographic Techniques.
	of Geographical Analysis	CO.2. Knowledge of basic of Statistical data.
		CO.3. Knowledge and principles of surveying, its importance and utility in the geographical study.
T.Y.B.A.		
(Annual)	G-3. Gg-310 Regional	CO.1. Knowledge of geography of our Nation.
	Geography of India	CO.2. Awareness of the magnitude of problems and Prospects at National level.
		CO.3. Understanding of the inter relationship between the subject and the society.
		CO.4. Understanding of the recent trends in regional studies.
		OR
	G-3. Gg-310 Human Geography	CO.1. This course is to acquaint the students with the nature of man-environment relationship and human capability.
		CO.2. Adoption and modification of the environment under its varied conditions from primitive
		CO.3. Identification and understanding environment and population in terms of their quality and spatial distribution pattern.
		CO.4. Comprehension of the contemporary issues facing the global community.
	S-3 Gg-320 Agricultural	CO.1. Introduction of the Agricultural activities and its relation with Geography.
	Geography	

		CO.2.Familiarization with new modern technical methods and their applications in Agricultural activities.
		CO.3.Enabling the students to apply Previously knowledge in Problems and Prospects in agriculture

	S-4 Gg-301 Techniques of Spatial Analysis	CO.1 Study of SOI toposheets with proper interpretation of the physical and cultural landscapes and landforms over the hilly, plateau and plain regions.
		CO.2 Introduction to the weather charts of India Meteorology Department (IMD) including interpretation of various weather conditions during the summer, winter and monsoon seasons over India.
		CO.3 Brief study on applications of aerial photographs and satellite images in geography research
F.Y.Bsc paper I (Geo)	Geomorphology	CO1 Student understand the physical geography and its branches
		CO2 Students understand the interior of the earth ,origin of continents and ocean basins
		CO3 Student understand the crustal movement and internal movement of earth.
F.Y.Bsc paper II(Geo)	Climatology and oceanography	CO1 Students introduced by climatology basic principles ,concepts , nature ,scope and importance
		CO2 Students understand the composition and structure of the atmosphere.
		CO3 Students were learnt the isolations and temperature of the atmosphere.
FYBsc paperIII (Geo)	Techniques in physical geography	CO1 Student introduced about maps and scales and types conversion of scale.
		CO2 Student learnt the methods of relief representations
		CO3 Student got knowledge about SOI toposheet and draw profiles.
SYBsc Paper I (Geo)	Geography of resources	CO1 Student acquainted the fundamental concepts of resources and classified the resources.
		CO2 Student learnt about human resources.
		CO3 Students aware the relationship between resources and development and planning of resources.
SYBsc Paper II(Sem-I)	Watershed Management I	CO1 Student understood the concepts in the watershed management.
		CO2 Characteristics of watershed, introduced geo-morphological characteristics
		CO3 Introduced hydrological process in watershed
SYBsc PaperI (SemII)	Watershed Management I	CO1 Students understood about resource appraisal of watershed methods
		CO2 Student introduced to watershed planning – importance
		CO3 Student understood about water and soil conservation methods
SYBsc PaperIII	Fundamentals of geographical analysis	CO1 Student knows about how to present data and analysis
		CO2 They also know about map, types of map and projections

		CO3 Students know the types of serving
Department of Psychology		
F.Y.B.A (Annual)	Psychology General Paper-1(G1)	CO.1 Provision of the solid foundation for the basic principles of psychology
		CO.1 Familiarization with the historical trends in psychology, major concepts, heoretical perspectives, and empirical findings
S.Y.B.A (Annual)	Psychology General Paper -II (G2)	CO.1 Knowledge of basic concepts, theories and applications of Social psychology
		CO.2. Familiarization with group behaviour.
	Psychology Special Paper-I (S-1)	CO.1 Abnormal Psychology.
		CO.2 Knowledge of the recent classification of abnormality.
		CO.3 Knowledge about the causes, symptoms and treatments of various types of psychological disorders.
	Psychology Special Paper-II (S-2)	CO.1 Developmental Psychology
		CO.21 Knowledge of the basic concepts of human development processes.
		CO.3 Understanding the influences of various factors on development.
	SYBA Logic General Paper-II (G2)	CO.1 Logic and Principles of Reasoning
		CO.2 Knowledge of the principles and techniques of Axiomatic System, Predicate
		CO.3 Calculus, Relational Logic and Identity.
Department of Politics		
F.Y.B.A. (Annual)	Indian govt. and Politics paper G-1	CO1. Students can learn more about political process in details . They can know more about actual functioning both constitutional and Administrative.
		CO2. Emphasis on local influences of castes and jatis from language,religion ethic.
		CO3. Critical assesment of its impact on our pol,processes
		CO4. Learning of background of our constitution federal system structure of our state and central govt.party system election process
S.Y.B.A. (Annual)	Political Theory and concepts Paper-G-2	CO1.This is an introductory paper to the concepts, ideas and theories with reference to individualthinkers
		CO2.Students can learn in detail the concept of state , liberty,justice,power and Authority

		CO3.It is need of students to emphasite the containing this relevance of concepts.
	S1 Western Political Thoughts	CO1. From this paper students can studies the various thinkers and their thought .
		CO2. Students can study the classical tradition in politics theory from plato to marx.
	S2 Political Sociology	CO1. Students will learn basic principles of political theory .
		CO2. They can study various types of Political culture of different country .
		CO3. Knowledge of nature and types of Political participation.
T.Y.B.A. (Annual)	S-3 Public Administration	CO1. This paper is an introductory course in public Administration.
		CO2. The paper covers personal public administration in its historical context.
		CO3. Students learn more about the recent development in new public administration.
		CO4. Knowledge of our budget and its processes.
	S-4 International Politics	CO1.This paper deals with concepts and dimensions of International relations.
		CO2.Students learn different aspects of balance of power leading to the present situation of unipolar world
		CO3.Highliting of the various accepates and confict ,resolution,and collective security .
	G-3	CO1.Learning of idealogy like nationalism Gandhism,Fascism Political Ideology.
		CO1.Students will learn the role of different ideology and their impact in politics.
		CO1.Each idealogy will be critically studied in its historical context.
		CO1. Knowledge about various ideologies like nationalalismfascism,MarxismGandhism.
M.A –I History	History of its theory	CO1 To understand various concept of definition, nature and functions.
		CO2 To understand the history and its theory.
		CO3 To understand structuralism, post-structuralism, post-modernism.
M.A-II	History and its practice	CO1 Student understood research methodology of history.
		CO2 Student understood the types of operations in research methodology.
		CO3 Pupil understood various schools of history writing.
M.A-II	Debates in Indian History	CO1 Student understood the various debates about Aryan
		CO2 Student understood the state in Indian history .Ancient and medieval state and their formulation.
		CO3 Student understood What is urbanization and Urban Decay.
MA-II	World after world war-II	CO1 Student understood cold war and its origin and nature.
		CO2 Student understood what non-aligned movement is.
		CO3 Student understood development in South-East Asia.
MA-I	Cultural History of	CO1 संस्कृती म्हणजे काय हे समजले.

	Maharashtra	
		व् प्राचीन महाराष्ट्रातील महाराष्ट्राचे भौगोलिक स्थिती, भाषा समजते .
		व् मध्ययुगीन कालखंडात विविध पंथ उदयाला आले. त्या पंथांचा अभ्यास व भक्ती चळवळ समजली.
MA-I	Nature of Dalit moment in Maharashtra	व् बाबासाहेब आंबेडकरांचे सामाजिक आर्थिक राजकीय विचार समजले.
		व् डॉ. बाबासाहेब आंबेडकरांचे वेगवेगळे कार्य समजले.
		व् डॉ. बाबासाहेब आंबेडकरांचे भारतीय राज्यघटनेतील योगदान समजले.
MA-II	13th – 19th century in Maharashtra	व् १९ व्या शतकातील महाराष्ट्राची पार्श्वभूमी समजली.
		व् महाराष्ट्रातील प्रशासनावर आणि विचारसरणीवर पाश्चात्यांचा प्रभाव कसा पडत गेला हे समजले.
		व् महाराष्ट्रातील प्रबोधनात विविध घटकांचे योगदान समजले.
MA-II	History of Maharashtra in 20 century	व् भारतीय स्वातंत्र्य चळवळीत महाराष्ट्राचे योगदान समजले.
		व् ब्राह्मणेंतर चळवळ आणि दलित चळवळींचा उदय व विकास समजतो.
		व् महाराष्ट्रातील नागरीकरण, कापड उद्योग , साखर उद्योग आणि सहकार चळवळीचा अभ्यास समजतो.
MA-II sem-III	जगातील प्राचीन आणि मध्ययुगीन संस्कृती	व् सभ्यता व संस्कृती संकल्पना आणि अर्थ समजतो.
		व् विविध देशांच्या प्राचीन संस्कृतीचा परिचय होतो.
		व् ग्रीक आणि रोम या देशांच्या संस्कृतीचा अभ्यास होतो.
MA-I	मराठा राजतंत्र	व् मराठा राजतंत्राची संकल्पना समजली.
		व् मराठ्यांच्या इतिहासाचा अभ्यासाची साधने समजली.
		व् मराठ्यांची प्रशासकीय संरचना समजली.
MA-I Sem-II	Nature of Dalit moment in Maharashtra	व् डॉ. आंबेडकरांचे भारताविषयीचे धोरण समजले.
		व् डॉ. आंबेडकरांचे विचारांचा परिचय झाला.
		व् डॉ. आंबेडकरांचे बौद्ध धर्माविषयीचे विचार समजले.
MA-I Sem-II	प्राचीन भारतातील संकल्पना आणि संस्थांचा विकास	व् प्राचीन भारताचा इतिहास आणि कालखंड समजले.
		व् इतिहासातील अभ्यासाची साधने समजतात.
		व् इतिहासातील राजकीय संकल्पना समजल्या.
MA-I Sem-II	मराठा राजतंत्र	व् मराठा राजतंत्राची माहिती मिळाली.
		व् मराठ्यांचा इतिहास समजावून घेण्यासाठीच्या आवश्यक साधनांचा परिचय झाला.
		व् शिवपूर्वकाळ ते पेशवाईपर्यंतचा प्रवास समजला.
MA-I Sem-II	मराठ्यांचा सामाजिक आर्थिक इतिहास	व् मराठ्यांचा सामाजिक आर्थिक इतिहासाचा परिचय झाला.
		व् इतिहास अभ्यासाच्या साधनांच्या मदतीने मराठ्यांचा इतिहास समजला.
		व् मराठा काळातील ग्रामव्यवस्था, उत्पादन स्त्रोत आणि महसूल व्यवस्था समजली.

MA-II Sem-III	प्राचीन व मध्ययुगीन संस्कृतीचा इतिहास	व्१ प्राचीन कालखंडातील संस्कृतीची ओळख झाली.	
		व्२ प्राचीन कालखंडातील वेगवेगळ्या संस्कृतींचा अभ्यास करता आला.	
		व्३ ग्रीक आणि रोम संस्कृतीची माहिती मिळाली.	
MA-II sem-iv	२० शतकातील वैचारिक जगाचा इतिहास	व्१ पुनरूज्जीवन व बुद्धीप्रामाण्यवाद याविषयी माहिती मिळाली.	
		व्२ सुधारणावाद व सुधारणावादी चळवळींचा अभ्यास झाला.	
		व्३ वैज्ञानिक विचारप्रणालीचा अभ्यास झाला.	
MA-I	व्यावहारिक आणि उपयोजित मराठी	व्१ आवडीचे संशोधनाचे क्षेत्र निश्चित करता आले.	
		व्२ मराठी भाषा आणि वाङ्.मयाचे प्रगत ज्ञान झाले.	
		व्३ लेखन गुणांना उत्तेजन मिळाले.	
MA-I	मध्ययुगीन मराठी वाङ्.मयाचा इतिहास	व्१ वेगवेगळ्या वाङ्.मयप्रकारांचा परिचय झाला.	
		व्२ विविध साहित्यविषयक चळवळींचा परिचय झाला.	
		व्३ सामाजिक व वाङ्.मयीन परंपरांचे आकलन झाले.	
MA-I	भाषाविज्ञान : सामाजिक	व्१ स्वन स्वनिम स्वनांतर संकल्पनांचा परिचय झाला.	
		व्२ स्वनिमांचे प्रकार समजले.	
		व्३ अर्थविन्यासाचे प्रकार समजले.	
MA-I	ग्रामीण साहित्य	व्१ साहित्यप्रवाहांचे ज्ञान झाले.	
		व्२ सामाजिक व वाङ्.मयीन परंपरांचे ज्ञान झाले.	
		व्३ कृषि संस्कृती व अवस्थांतरे समजली.	
MA-II	प्रसारमाध्यमे आणि साहित्यव्यवहार	व्१ लेखन कौशल्यांचा विकास झाला.	
		व्२ प्रसारमाध्यमांचे समाजातील महत्त्व समजले.	
		व्३ प्रसारमाध्यमात सेवेची संधी मिळविण्यासाठी भाषिक कौशल्यांचा विकास झाला.	
MA-II	साहित्य समीक्षा व संशोधन	व्१ समीक्षा संकल्पनेचा परिचय झाला.	
		व्२ विविध समीक्षा पद्धतींचा परिचय झाला.	
		व्३ अंतर्विद्याशाखीय संशोधनाचे स्वरूप व महत्त्व समजले.	
MA-II	विशेष लेखकाचा अभ्यास	व्१ लेखकाच्या जडणघडणीचा परिचय झाला.	
		व्२ लेखकाचे साहित्यिक योगदान समजले.	
		व्३ लेखकाची लेखनशैली व साहित्यविषयक विचार यांचा परिचय झाला.	
MA-II	लोकसाहित्याची मूलतत्त्वे आणि मराठी लोकसाहित्य	व्१ लोकसाहित्य संकल्पना व स्वरूप समजते.	
		व्२ लोकसाहित्याची व्यापकता व सर्वसमावेशकता समजते.	
		व्३ लोकसाहित्यातील सामाजिक, सांस्कृतिक, धार्मिक जाणवा समजल्या.	
MA-I	Indian Economics Policy	व्१ राष्ट्रीय उत्पन्न रचना व स्वरूप समजले.	

		ळरदारिद्रय आणि बेकारी व लोकसंस्थेची वैशिष्ट्ये समजली.	
		ळउर्जा व वहातूक यांच्या पायाभूत सुविधांची माहिती मिळाली.	
MA-I sem-II	Agricultural Economics	ळभारतीय शेती स्थान, उत्पादकता यांची माहिती मिळाली.	
		ळशेती क्षेत्रातील मजूरांची समस्या समजली.	
		ळशाश्वत शेती म्हणजे काय ते समजले.	
MA-II sem-III	Growth and Development	ळविकसित आणि अविकसित संकल्पना समजली.	
		ळरदारिद्रय आणि विषमता यांची माहिती समजली.	
		ळआर्थिक विकासाच्या सिध्दांताचा अभ्यास समजला.	
MA-II sem-IV	Growth and Development	ळकृषि आणि उद्योगाची आर्थीक विकासातील भूमिका समजली.	
		ळपर्यावरणाचा विकास आणि वृद्धी यांचा परिचय झाला.	
		ळव्यवहार आणि विश्वास यांची माहिती मिळाली.	
T.Y.B.A.	आत्मथाएँ /काव्य, नाटक	ळआत्मकथा और काव्य, नाटक का परिचय हुआ।	
		ळपारिभाषिक शब्द का परिचय हुआ।	
		ळपत्रलेखन पध्दती अवगत हुआ।	
MA-I sem-I	प्राचीन काव्य	ळप्राचीनकालीन काव्य का परिचय हो गया।	
		ळउपन्यास, कहानी के तत्व का परिचय हुआ।	
		ळअलंकार, रस इन साहित्य विधाओंका ज्ञान हुआ।	
MA-I Sem-II	मध्ययुगीन काव्य	ळ निर्गुण और सगुण शाखाओंका परिचय हुआ।	
		ळआधुनिक हिंदी कथा साहित्य नाटक और निबंध का परिचय हुआ ।	
		ळपाश्चात्य साहित्यशास्त्र और सिध्दांत समज गए।	
MA-II sem-III	आधुनिक काव्य	ळकाव्य का महत्त्व और योगदान समज गया।	
		ळआधुनिक काव्य का परिचय हुआ।	
MA-II sem-III	भाषाविज्ञान	ळभाषा की परिभाषा समज गयी।	
		ळभाषा संकल्पना और स्वरूप का परिचय हुआ।	
MA-II Sem-III	हिंदी साहित्य का इतिहास	ळप्राचीन काल के साहित्य का परिचय हुआ।	
		ळसाहित्यिक रचनाओंका ज्ञान हुआ।	
MA-II Sem-III	आधुनिक हिंदी आलोचना	ळआलोचना का स्थान समज गया।	
		ळआलोचना महत्व दर्शाना और आलोचना का भाषा में स्थान समज गया।	
MA-II sem-IV	आधुनिक काव्य	ळआधुनिक काव्य का परिचय हुआ।	

		ब्रह्मकुंवर नारायण की रचनाओंका परिचय हुआ।	
MA-II sem-IV	हिंदी भाषा का ऐतिहासिक विकास	ब्रह्महिंदी भाषा का विकासक्रम समज गया।	
		ब्रह्महिंदी का ऐतिहासिक विकास समज गया।	
MA-II sem-IV	भारतीय साहित्य	ब्रह्मअनुवादीत साहित्य का परिचय हुआ।	
		ब्रह्मनाटक वाङ्मय प्रकार का परिचय हुआ।	
M.A –I(Sem-I)	International trade	CO1 To understand international theories	
		CO2 To understand concept term of trade.	
		CO3 To understand trade policy.	
M.A-I(Sem-II)	International finance	CO1 To understand concept-balance of payment	
		CO2 To understand functions of foreign exchange market.	
		CO3 To understand concept of international capital flow.	
M.A-II (sem-III)	Demography and rural development	CO1 understood the demography nature & scope.	
		CO2 understood the population theories.	
		CO3 understood the population structure.	
M.A-II (sem-IV)	Demography and rural development	CO1 Understood the concept, scope and objectives.	
		CO2 Understood the rural infrastructure.	
		CO3 Understood the problems of rural development.	
M.A-II (Sem-III)	Modern Banking	CO1 Understood the role of financial system.	
		CO2 Enable to learn role and functions.	
		CO3 understand the non-banking financial institutions.	
M.A-II (Sem-IV)	Research Methodology	CO1 Understand the meaning and types of research.	
		CO2 Enable to learn various research and techniques.	
		CO3 understand analysis of data.	
M.A-I (Sem-I)	Micro-Economics	CO1 understood the concept of market.	
		CO2 To learn about consumer behavior.	
		CO3 Student find out the meaning of production.	

		CO8. Understanding the concept and techniques of different types of index numbers.
	Organizational Skill	CO2.Orientation of the students towards the concept of Organization and Modern Office.
	Development. (Paper -105 -a)	CO2.Knowledge and role of and Functions of Office Manager.

		CO3.Knowledge of the functioning of Modern office appliances equipments and e- format
	Marketing & Salesmanship (106-c)	CO1.Awareness about market and marketing.
		CO2.Establishment of link between commerce/Business and marketing.
		CO3.Understanding of the basic concept of marketing.
		CO4.Understanding and marketing philosophy and generating ideas for marketing research.
		CO5.Knowledge about the relevance of marketing in modern competitive world.
		CO6.Development of an analytical ability to plan for various marketing strategy.
	Business Environment &	CO1.Awareness about the Business Environment.
	Entrepreneurship (106-e)	CO2.Creation of entrepreneurial awareness among students,
		CO3. Motivation of making their mind set for taking up entrepreneurship as career.
S.Y.B.Com. (Annual)	Business Communication -201	CO1.Understanding of the concept, process and importance of communication.
		CO2.Provision of knowledge of various media of communication.
		CO3. Development of business communication skills through the application and exercises
	Corporate Accounting (-202)	CO1.Awareness about the conceptual aspect of corporate accounting
		CO2.Enabling the students to develop skills for Computerized Accounting
	Business Management (204)	CO1.Provision of knowledge & understanding about business management concept.
	Elements of Company Law (205)	CO1.Imparting the students with the knowledge of fundamentals of Company Law.
		CO2. Knowledge of new concepts involving in company law regime.
		CO3.Awareness to students with the duties and responsibilities of Key Managerial Personnel.
		CO4. Imparting students the provisions and procedures under company law.
	Marketing Management –(I) (-206-h)	CO1. Orientation of the students with recent trends in marketing management
		CO2.Awareness about marketing of eco friendly products in the society through students
		CO3. Knowledge and the use of E-Commerce in competitive environment
		CO4.Understanding the influences of marketing management on
S.Y.Bcom	Business Economics	CO1 Understood micro economics
		CO2 Understood the concept of national income.
		CO3 understood the concept of money and banking.

T.Y.B.Com.	Business Regulatory Framework	CO1.Development and the awareness among the students regarding these laws affecting business, trade and commerce.
(Annual)	(Mercantile Law) (301)	
	Advanced Accounting (302)	CO1. Imparting the knowledge of various accounting concepts
		CO2. Knowledge about accounting procedures, methods and techniques.
		CO3.Development of practical approach to accounts writing by using software
	Auditing & Taxation (Paper - 304)	CO1.Knowledge about preparation of Audit report.
		CO2.Assurance Standards, Tax Audit, and Audit of computerized Systems.
		CO3.Knowledge about the concept and principles of Auditing, Audit process,
	Marketing Management. (Paper-II)	CO1.Understanding of the concept and functioning of marketing planning and sales management
	(Course Code 305 -h)	CO2.Knowledge of marketing strategies and organization
		CO3.Information of various facets of marketing with regulatory aspects
	Marketing Management(Paper-III) (h)	CO1.Understanding the role Brand and Distribution Management in marketing
		CO2.Information about Marketing and Economic Development
		CO3.Knowledge and the importance of control on marketing activities
III. Course Outcomes (COs) of Science Faculty		
Department of Physics		
F.Y. B.Sc.		
(Annual)	Mechanics, Heat and Thermodynamics Paper I. (Section-I)	CO1. An understanding of Newton's laws of motion and applying them in calculations of the Motion of simple systems.
		CO2. Understanding the concepts of energy, work, power.
		CO3. Understanding of the concepts of conservation of energy, surface tension and viscosity the concepts of elasticity and be able to perform calculations using them.
	Heat and Thermodynamics Paper II. (Section –II)	CO 1. Understanding of the: properties and relationships between the thermodynamic properties of a pure substance ideal gas equation and its limitations, real gas

		CO 2. The laws of thermodynamics to formulate the relations necessary to analyze a thermodynamic process,
		heat engines and calculate thermal efficiency.

		CO 3. Analyze the refrigerators, heat pumps.
	Physics Principles and	CO 1. Understanding of the various atomic theories and calculation of energy value of atom.
	Applications Paper II (Section-I)	CO2. Understanding of electromagnetic waves and its spectrum, types and sources of electromagnetic waves and applications.
		CO 3. The general structure of atom, spectrum of hydrogen atom.
		CO4. Understanding of the atomic excitation and LASER principles. Different bonding between in atoms and molecules.
	Electromagnetics (Section-II)	CO 1. Exposure to the fundamental laws of electricity, magnetism and their applications in day to day life,
		CO 2. Making the awareness to students about Gauss's and Coulomb's Law,
		CO3. Development of understanding among the students about principles of electromagnetic induction,
		CO4. Knowledge about the basics of magnetostatics.
	Practical course (paper-III)	CO1. Exposure of techniques of handling simple instruments and also certain mechanical and thermal properties of matter.
		CO 2. Acquire technical and manipulative skills in using laboratory equipment, tools, and materials.
		CO3. Demonstrate an ability to collect data through observation and/or experimentation and interpreting data.
		CO5 Demonstrate an understanding of laboratory procedures including safety, and scientific methods.
		CO6. Acquire the complementary skills of collaborative learning and teamwork in laboratory settings.
S.Y. B.Sc.	PHY 211) Mathematical Methods	CO 1 Understand the complex algebra useful in physics courses.
(Semester-I)	in Physics I (Paper-I)	CO 2. Understand the concept of partial differentiation.
		CO 3. Understand the role of partial differential equations in physics.
		CO4. Understand vector algebra useful in mathematics and physics.
		CO5. Understand the singular points of differential equation.
	(PHY 212) Electronics I (Paper-II)	CO1 Apply laws of electrical circuits to different circuits.
		CO2. Understand the relations in electricity and properties and working of transistors.
		CO3. Understand the functions of operational amplifiers.
		CO4 Design circuits using transistors and operational amplifiers.
		CO5. Understand the Boolean algebra and logic circuits.
		OR
	(PHY 222) Instrumentation (Paper-III)	CO1. Understand the functions of different instruments.

		CO2. Use different instruments for measurement of parameters.
		CO3. Design experiments using sensors.
(Semester-II)		
	(PHY221) Oscillations, Waves	CO 1. Understand the physics and mathematics of oscillations.
	and Sound (Paper-I)	CO 2. Solve the equations of motion for simple harmonic, damped, and forced oscillators.
		CO 3. Describe oscillatory motion with graphs and equations, and use these descriptions to solve problems of oscillatory motion.
		CO4. Explain oscillation in terms of energy exchange, giving various examples.
		CO5. Understand the mathematical description of travelling and standing waves.

		CO6. Explain the Doppler effect, and predict in qualitative terms the frequency change that will occur for a stationary and a moving observer.
		CO7. Explain in qualitative terms how frequency, amplitude, and wave shape affect the pitch, intensity, and quality of tones produced by musical instruments.
	(PHY 222) Optics (Paper-II)	CO 1. Acquire the basic concepts of wave optics
		CO 2. Describe how light can constructively and destructively interfere
		CO3. Summarize the polarization characteristics of electromagnetic waves
		CO4. Understand optical phenomena such as polarization, birefringence, interference and diffraction in terms of the wave model.
		CO5. Analyze simple examples of interference and diffraction phenomena.
		CO6. Be familiar with a range of equipment used in modern optics.
	(PHY 223) Practical Paper III (Annual)	CO 1. Use various instruments and equipment.
		CO2. Design experiments to test a hypothesis and/ determine the value of an unknown quantity.
		CO3. Investigate the theoretical background to an experiment.
		CO4. Set up experimental equipment to implement an experimental approach.
		CO5. Analyse data, plot appropriate graphs and reach conclusions from your data analysis.
T.Y. B.Sc.		
Semester-I	(PH 331) Mathematical Methods in Physics II	CO1. Calculate with vectors and scalars in physics.
		CO2. Determine the difference between Complex numbers and Real number.
		CO3. Learn geometrical representation of complex numbers.
		CO4. Find Fourier Series of periodic function,
		CO5. Use Laplace transform as tools of Physics.
	PH 341) Solid State Physics	CO ₁ . Have a basic knowledge of crystal systems and spatial symmetries.
		CO ₂ . Be able to perform structure determination of simple structures.
		CO ₃ . Know the significance of Brillouin zones,
		CO ₄ . Know Bloch's theorem and what energy bands.
		CO ₅ . Know the fundamental principles of semiconductors, including pn-junctions, and be able to estimate the charge carrier mobility and density.
		CO ₆ . Be able to account for what the Fermi surface is and how it can be measured.

	PH 333) Classical Mechanics	CO ₁ . Training the students of B. Sc. class in the Mechanics of the particles.
		CO ₂ . Motion of central force, scattering of particles, Lagrangian and Hamiltonian formalisms to an scope that they can use these in the modern branches.
		CO ₃ . Understanding of Central force, Reduction of two body problem into equivalent one body problem, Motion in inverse square law force field and to state Kepler's laws.
T. Y. BSc.- SEM – I	Paper-I: Advanced digital system design	CO1 - Understand digital system designing process and state reduction technique.
		CO2 – Understand importance of Verilog and modeling types.
		CO3 – Understand various programmable logic designs.
		CO4 – Studied various case studies.
T. Y. BSc SEM – I	Paper-II: Microcontrollers	CO1 – Learn the architecture of 8051 microcontroller.
		CO2 – Learn instruction set and how uses it.
		CO3 – Understand how to interface memory with microcontroller.
		CO4 – Understand how to interface I/O devices with microcontroller.
T. Y. BSc.- SEM – I	Paper-III: Analog circuit designing and applications of linear IC's	CO1 – Understand the OP-AMP working, their stability, different technique for compensation.
		CO2 – Understand the basic applications of OP-AMP filter, practical log antilog amplifier.
		CO3 – Understand the basic applications of linear ICs IC (LM311), F.G. – ICL8038, LM566.
		CO4 – Understand the PLL (Phase Locked Loop) and Regulators (Voltage).
T. Y. BSc.- SEM – I	Paper-IV: Analog circuit designing and applications of linear IC's	CO1 – Understand the Bhor model, different crystal structure, excess carrier in semiconductor.
		CO2 – Understand the forward and reverse biased junction, breakdown-Reverse bias, zener, and avalanche.
		CO3 – Understand the structure, operation, characteristics of BJT and their effect of BJT.
		CO4 – Understand the concept of FET, MOSFET characteristics of MOSFET.
T. Y. BSc.- SEM – I	Paper-V: Analog circuit designing and applications of linear IC's	CO1 – Understand the fundamentals of C language.
		CO2 – Understand the development of algorithm, flowchart for writing program.
		CO3 – Understand the concept and use of functions, array and pointer.
		CO4 – Understand the different types of algorithm.
T. Y. BSc. SEM – I	Paper-VI: Fiber optic communication	CO1 – Understand basic structure of OFC and types of OFC cable.
		CO2 – Understand type of optical sources and detectors.
		CO3 – Understand various losses in OFC and their measurement.
		CO4 – Understand the fiber optic communication.

T. Y. BSc.- SEM – II	Paper-I: Advanced communication system	CO1 – Understand the basic concept of antenna and propagation, different types of antenna.
		CO2 – Understand the modulation, demodulation filter method, phase locked loop.
		CO3 – Understand the AM, FM transmitter and receiver, speed gun, LNA.
		CO4 – Understand the digital communication modulation types.
T. Y. BSc.- SEM – II	Paper-II: Microcontroller and its applications	CO1 – Understand how to use C language for microcontroller programming.
		CO2 – Understand how to use timers, interrupts and serial communication.
		CO3 – Understand how to apply this knowledge in real world applications.
		CO4 – Understand architecture and basic programming of PIC18F4580
T. Y. BSc.- SEM – II	Paper-III: Power electronics	CO1 – Understand basics of power electronics and power devices and its introduction.
		CO2 – Understand power devices operation and protection of these devices.
		CO3 – Understand various types of power circuits.
		CO4 – Understand applications of power electronics.
T. Y. BSc.- SEM – II	Paper-IV: Foundation of Nanoelectronics	CO1 – Understand the principles of electromagnetics.
		CO2 – Understand wave particle duality principle and wave mechanics.
		CO3 – Understand the classical statistics and conductivity of metals.
		CO4 – Understand the importance of nanoelectronics and quantum dot applications.
T. Y. BSc.- SEM – II	Paper-V: Mathematical and circuit analysis using MATLAB	CO1 – Introduction to MATLAB, understood the 2D and 3D plots, different statement and their programming.
		CO2 – Understood the Fourier series and also MATLAB exercise.
		CO3 – Understood the Laplace Transform, their properties, applications.
		CO4 – Understood the mathematical applications, diode characteristics, Ohm's law, RC filter.
T. Y. BSc.- SEM – II	Paper-VI: Industrial automation	CO1 – Functional elements of instrument and generalized measurement.
		CO2 – Understand bridge circuit and DAS system.
		CO3 – Understand process control system and characteristics and parameters.
		CO4 – Understood the various controller modes.
T. Y. BSc	Practical: Practical course-I	CO1 – Understand wave shaping circuits and log amplifier.
		CO2 – Understand the function generator and multivibrators types.
		CO3 – Understand the static characteristics of MOSFET and light dimmer circuit.
		CO4 – Understand FM modulator using VCO and QASK.
		CO5 – Understand the Hall Effect and four probe method.
		CO6 – Understand the solar cell and Band gap measurement.
		CO7 – Understand the propagation losses and bending losses in fibers.
		CO8 – Understand the numerical aperture measurement.
T. Y. BSc.-	Practical: Practical course-II	CO1 – Understand the basics of C programming.

		CO2 – Understand use of Verilog HDL for designing combinational and sequential circuits.
		CO3 – Understand the assembly level language use for 8051 microcontroller programming.
		CO4 – Understand the C language use for 8051 microcontroller programming.
		CO5 – Understand the interfacing circuit used with 8051 microcontroller.
T. Y. BSc.- Practical:	Practical course-III (Project Work)	CO1 – Understand selection of component and devices for project work.
		CO2 – Understand how to apply theoretical concept for designing project.
		CO3 – Understand the PCB designing, soldering and use of various instruments.
		CO4 – Understand the errors finding during project testing.
		CO5 – Understand the concept and real application of project.
M Sc Sem-I	Basic Organic Chemistry	CO1 To understand the basic organic chemistry and chemical bonding and the different types of reactivity.
	(Section -I) Structure and reactivity	CO2 To understand the basic concepts of acids and bases.
		CO3 To understand the various structures of intermediate in-organic reactions mechanism theory.
	2 Stereochemistry	CO1 To understand the concept of stereochemistry.
		CO2 To assign the orientation bonds in the molecule and assign the configuration.
		CO3 to understand the stereo specific and stereo selective reactions.
M .Sc Sem-II	Synthetic organic chemistry	CO1 To understand the various types of reagent and its selective roles in oxidation.
		CO2 To understand the various types of reducing agents.
		CO3 To understand the rearrangements to reason for rearrange bond.

	(PH 334) Atomic and Molecular Physics	CO 1. Describe the latest vector atom model and drawbacks of previous models.
		CO2. Know and understand the normal and anomalous Zeeman effect, Paschen Back as well as Raman Effect basically.
		CO3. Define and discuss the concepts of microstate and macrostate of a model system.
		CO4. Define and discuss the Boltzmann distribution and the role of the partition function.
		CO5. Discuss the concept and role of indistinguishability in the theory of gases; know the results expected from classical considerations and when these should be recovered.
		CO6. Define the Fermi-Dirac and Bose-Einstein distributions; state where they are applicable.
	(PH 335) Computational Physics	CO ₁ . Familiarization with the numerical methods used in computation and programming using C+ language
		CO ₂ . They can use these in solving simple problems pertaining to Physics.
		CO3. Arrays and pointers in C.
	(PH 336) Astronomy and Astrophysics	CO1. Understand the fundamentals of astronomy.
		CO2. Understand astronomical instruments.
		CO3. Understand formation of stars
		CO4. Understand Galaxies and dark matter
Semester-II	(PH 341) Classical Electrodynamics	CO1. The outcome of this course is to understand the covariant formulation of electrodynamics to explore the unification of electricity and magnetism.
		CO2. Origin of the electromagnetic radiation by an accelerating charge particle: Its applications to linear and circular accelerators.
		CO3. Understanding of the scattering of electromagnetic wave by free and bound electron.
	(PH 343) Thermodynamics and Statistical Physics	CO1. Describe the latest vector atom model and drawbacks of previous models,
		CO2. Know and understand the normal and anomalous Zeeman effect, Paschen Back effect and Stark effect as well as Raman Effect basically,
		CO3. Define and discuss the concepts of microstate and macrostate of a model system,
		CO4. Define and discuss the Boltzmann distribution and the role of the partition function.
		CO5. Discuss the concept and role of indistinguishability in the theory of gases; know the results expected from classical considerations and when these should be recovered.
		CO6. Define the Fermi-Dirac and Bose-Einstein distributions; state where they are
	(PH342) Quantum Mechanics	CO1. Show an understanding of wave mechanics;

		CO2. Know the concept of operators in quantum mechanics.
		CO3. Perform calculations on wave functions, and solve the Schrödinger equation for simple potential problems.
		CO4. Apply Schrodinger's equation in Hydrogen atom;
		CO5. Describe the structure of the hydrogen atom and show an understanding of quantization of angular momentum.
	(PH344) Nuclear Physics	CO1. Understand the fundamental principles and concepts governing nuclear and particle physics.
		CO2.Demonstrate knowledge and understanding of scientific and technological applications, of Nuclear Physics

		as well as their social, economic and environmental applications.
		CO3. Demonstrate comprehension of physical reality through estimation, approximation, and mathematical modeling, and understand how small number fundamental physical principles underlie a huge variety of interconnected natural phenomena,
		CO4. Able to explain the Rutherford's experiment, Nuclear Radiation and
	(PH345) Electronics II	CO1. Electronics is nothing but efficient applications of semiconductor materials.
		CO2. Here students learn various electronic devices with fundamental and application point of view. Define and discuss Algebraic and K-map simplification methods. Implementation of Boolean equation.
		CO3. Be able to explain Flip-Flop (RS, JK, T and D) i. e combinational logic circuits adder and subtractors. More about sequential logic circuits i.e. Asynchronous.
	(PH346) Laser	CO1. Ordinary light and laser
		CO2. Stimulated emission
		CO3. To understand laser output
		CO4. Different application of laser
	Practical Courses (Annual)	
	(PH347) Laboratory Course I	CO1. Laboratory course I deals with the experiments based on fundamental concepts in Physics.
	(Phy348) Laboratory Course II	CO2. Laboratory course II involve experiments using electronic devices and program writing with C.
	(PH349) Laboratory Course III (Project)	CO3. Laboratory course III gives free hand to student to work in any physics subject to carry
M.Sc. I Semester-I	PHYUT 501 Classical Mechanics (5 Credits)	CO1. Constrained motion and lagrangian formulation CO2. Vibrational principles and Hamilton formulation CO3. Canonical transformation and poisson bracket
	PHYUT 502 Electronics (5 Credits)	CO1- To understand the Applications of special function ICs CO2- To understand the Regulated power supply CO3- To understand the Digital Logic circuits: Combinational Logic and Sequential Logic CO4- To understand the Analog to digital converters and Digital to analog converters
	PHYUT 503 Mathematical Methods in Physics (4Credits)	CO1- To understand the linear spaces and operators CO2- To understand the Matrix Algebra CO3- To understand the Special Functions CO4- To understand the Fourier series and Integral transforms

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	(PHYUP 505) Physics Lab I (5 Credits)	CO1. Laboratory course I deals with the experiments based on fundamental concepts in Physics.
Semester II	(PHYUT601) Electrodynamics (5 Credits)	CO1- To understand the Multipole expansions and time varying fields CO2- To understand the Energy, force, momentum relations and electromagnetic wave Equations CO3- To understand the Inhomogeneous wave equations and Gauge transformations CO4- To understand the Relativistic Mechanics and Covariance
	(PHYUT602) Solid State Physics (5 Credits)	CO1- To understand the Band Theory of Solids CO2- To understand the Diamagnetism and Paramagnetism CO3- To understand the Ferromagnetism, Antiferromagnetism and Ferrimagnetism CO4- To understand the Superconductivity
	(PHYUT 603) Quantum Mechanics I (5 Credits)	CO1- To understand the Revision and general formalism CO2- To understand the Representation of States – Dirac notation CO3- To understand the Angular Momentum CO4- To understand the Approximation Methods
	PHYUT604: LASERS	CO1- To understand the Interaction of radiation with matter CO2- To understand the three and four level system CO3- To understand the Different types of lasers CO4-To understand the Laser applications
	(PHYUT 605) Experimental Techniques in Physics II (4Credits)	CO1- To understand the Radiation Sources, Detectors and Sensors CO2- To understand the Structural Characterization and Thermal Analysis CO3- To understand the Morphological and Magnetic Characterization CO4- To understand the Spectroscopic Analysis
	(PHYU P606) Physics Lab II (5 Credits)	CO1. Laboratory course II deals with the experiments based on fundamental concepts in Physics
M. Sc II	(PHYUT701) Statistical Mechanics	CO1. The outcome of the course on Statistical Mechanics to expose students to

Semester III	in Physics (5 Credits)	the theoretical techniques
		CO2. Understanding the interacting systems, phase transitions and the non-equilibrium phenomena.
		CO3. To understand the Ideal Bose and Fermi Systems

	(PHYUT702) Quantum Physics (5 Credits)	CO1. Understanding the basic principles of quantum mechanics.
		CO2. Solve the Schrodinger equation to obtain wave functions for some basic, physically important potential, and estimate the shape of the wave function based on the shape of the potential.
		CO3. Understand the role of uncertainty in quantum physics, and use the commutation relations of operators to determine whether or not two physical properties can be simultaneously measured.
		CO4. Develop a knowledge and understanding of perturbation theory and level splitting.
	(PHYDT703) Energy Studies I	CO1. The outcome of the course on Science of renewable Energy Sources is to students to the basics of the alternative energy sources like solar energy, hydrogen energy, etc.
		CO2- To understand the Radiation and Its Measurements
	(PHY DT 704) ASTRONOMY AND ASTROPHYSICS I	Co1- To Understand the Astronomical Scales & Basic Concepts of Positional Astronomy
		Co2- To Understand the Astronomical Techniques and Physical Principles
		Co3- To Understand the Sun and Stellar Structure
		Co4- To Understand the Star Formation, Nucleosynthesis and Stellar Evolution
	PHYDT705: SPECTIAL LAB I	1) ASTRONOMY
		CO1- To understand the polar align an astronomical telescope
		CO2- To understand the Computation of a lunar eclipse
		CO3- To understand the Computation of a solar eclipse
		2) ENERGY STUDIES
		CO1- To understand the Determination of Calorigic value of Wood/Cow dung
		CO2- To understand the Study of Photovoltaic a Characteristics of Solar Cell
		CO3- To understand the Study of power versus load characteristics of Solar Power Photovoltaic Systems
	(PHYDP 706) Physics Lab III (5 Credits)	CO1. Understanding of the general concepts in C language.
		CO2. Application of Physics concepts in solving problems.
		CO3. Familirization of statements and array of C language.
		CO4. Emphasis on the significance of C+ theory.
Semester IV	(PHYUT801) Nuclear Physics (5 Credits)	CO1. Understand the fundamental principles and concepts governingnuclearand particle physics.
		CO2. Demonstrate knowledge and understanding of scientific and technological applications, of Nuclear Physics as well as their social, economic and environmental applications,
		CO3.Demonstrate comprehension of physical reality through estimation, approximation, and mathematical

		modeling,
		and understand how small number fundamental physical principles underlie a huge variety of interconnected natural phenomena.
		CO4. Able to explain the Rutherford's experiment, Nuclear Radiation and Charged Particle Accelerators.
	(PHYUT802) Material Science (5 Credits)	CO1. Various production techniques and applications.
		CO2. Fracture analysis for different metals.
		CO3. Strengthening mechanisms and Applications of metallic and nonmetallic materials.
	(PHYDT803) Energy Studies II (5 Credits)	CO1. The outcome of the course on Science of renewable Energy Sources is to expose the students to the basics of the alternative energy sources like solar energy, hydrogen energy, etc.
		CO2- To understand the Photothermal applications of Solar Energy
		CO3- To understand the Hydrogen Energy
		CO4- To understand the Wind and Bio Energy
	(PHYDT804) ASTRONOMY AND ASTROPHYSICS II	CO1- To understand the Basic Structure and Properties of the Milky Way
		CO2- To understand the Galaxy Morphology, Hubble's Classification of Galaxies
		CO3- To understand the Astronomical Techniques
		CO4- To understand the Large Scale Structures & the Expanding Universe

	(PHYUP805) Special Lab II:	1) Astronomy and Astrophysics
		CO1- To understand the to study the characteristics of CCD camera
		CO2- To understand the to polar align an astronomical telescope
		2) Energy Studies
		CO1- To understand the Determination of heat Loss Coefficeient in Flat Plate Collector
		CO2- To understand the Study of Hot Water system
	(PHYUP806) Project (5 Credits)	CO1. Creation of opportunity to participate in some ongoing research activity
Department of Mathematics		
F.Y.B.Sc (Annual)	Algebra& Geometry. PaperI	CO1. The course aids in basic understanding of the integers , polynomials , system of linear equations , eigen values&eigen vectors .
		CO2. Study and classification of conics , analytical geometry of 2D & 3D , plane ,sphere cone & cylinder.
	Calculus & Differential Equations. Paper II	CO1. Study of calculus of real valued functions of real variables .
		CO2. Knowledge of differential equations of first order and first degree.
		CO3. Applications of differential equations of first order and first degree.
		CO4. Study how to find integration of : Rational functions by using partial fractions.Irrational functions by using partial fractions. Reduction formulae.
	Practical Course Paper-III	CO1.Imparting skill to solve problems .
S.Y. B.Sc Semester-I	Multivariable Calculus. Paper I	CO1.Study calculus of functions of several variables.
		CO2.Applications of double and triple integration.
	Discrete Mathamatics. Paper II	CO1.Permutation and combination
		CO2.Prepare truth table.
	Practical Course.	CO1.Imparting skill to solve problems .
Semester-II	Linear Algebra Paper II	CO1.Knowledge of vector spaces and subspaces.
		CO1.Finding of the basis and dimension of vector spaces.

		CO1.Knowledge and study Linear Operators on vector spaces and their properties.
		CO1.Study Inner Product spaces and properties, Gram-Schmidt Process.
	Multivariable Calculus Paper II	CO1. Limit, continuity and differentiation of vector valued function
		CO2.linear transformation
	Practical Course.	CO1.Imparting skill to solve problems.

T.Y. B.Sc.	Metric Spaces	CO1.Introductory Concepts
Semester-III	Paper I	CO2. Study continuous functions on metric spaces.
		CO3. Knowledge and study of connectedness and completeness property of Metric Spaces.
	Real Analysis I Paper II	CO1.Knowledge and study Sets and Functions.
		CO2.Study of convergence of sequences and series of Real Numbers.
	Problem course based on	CO1. Imparting skill to solve problems.
	paper I & II Paper III	
	Group Theory Paper IV	CO1.Learning of groups and subgroups.
		CO2.Knowledge and study of Permutation groups.
		CO3.Knowledge and study Homomorphisms of groups and factor groups.
	Ordinary Differential	CO1.Linear Differential Equations with constant coefficients.
	Equations Paper V	CO2.Non Homogeneous differential Equations
		CO3.Power series solution of Differential Equations.
		CO4.System of first order equations.
	Problem course based on	CO1.Imparting skill to solve problems.
	paper III & IV Paper VI	CO2.Theory
	Operational Research. Paper VII	CO1. Knowledge and study Modeling with linear programming ,
		CO2.Simplex Method , Duality,
		CO3.Transportation Model , The assignment model .
	Number Theory VIII	CO1.Knowledge and study of Divisibility of integers ,
		CO2.Congruences ,
		CO3.Greatest Integer Function ,
		CO4.Quadratic Reciprocity ,
		CO5.Diophantine Equations .
	Practical Course IX	Imparting skill to solve problems.
Semester-IV	Complex Analysis Paper I	CO1.Knowledge and study of Complex Numbers ,
		CO2.Analytic functions , Elementary functions ,
		CO3.Integrals , Series , Residues and poles .

	Real Analysis II Paper II	CO1. Study of Riemann Integrations ,
		CO2.Improper Integrals ,
		CO3.Sequences and series of functions.
	Problem Course based on	CO1.Imparting skill to solve problems.
	Paper I & II Paper III	

	Ring Theory Paper IV	CO1.Knowledge and study of Rings and Fields ,
		CO1.Ideals and Factor Rings , Factorization .
	Partial Differential Equations Paper V	CO1.Knowledge of Ordinary Differential equations in more than two variables and their methods of substitution,
		CO2.First order partial differential equations , Types and methods of solution.
	Problem course based on Paper III & IV Paper VI	CO1.Imparting skill to solve problems .
	Labesgue Integration Paper VII	CO1. Study of Measurable Sets , Measurable Functions ,
		CO2.Labesgue Integration , Fourier Series.
	Computational Geometry Paper VIII	CO1. Study of two dimensional transformation ,
		CO2.Three dimensional transformation ,
		CO3.Plane curves ,Space curves , Beizer Curves .
	Practical Course IX	CO1.Imparting skill to solve problems

Department of Electronics

F.Y. B.Sc. (Annual)	Analog Circuit Design Paper I	CO1. Introduction of various analog circuits.
		CO2. The basic designing aspects for analog electronic system are introduced.
		CO3. The basic principles of amplifiers and oscillators are introduced, which gives idea about their applications.
		CO4. This course develops analog system designing skills among the student, which leads to
		develop their knowledge of analog circuits in different applications.
	Principles of Digital Electronics Paper II	CO1. This course is designed to make students familiar with concepts of digital electronics.
		CO2. The learning of various number systems is very important in accordance of there practical applications
		in the field of digital system.
		CO3. This course introduces to the students with basic logic gates, Boolean algebra and K-Maps along with their applications.
		CO4. The arithmetic circuits, combinational circuits and sequential circuits make students sound in
		designing of digital system for various applications.
		CO5. Studies of logic families are very important in order to design actual digital circuit for applications.

	Practical Paper III	CO1. Building of different electronic circuits for specific applications is the main aspect of this course.
		CO2. The practicals are based on theoretical concepts; it helps students to understanding principles of the
		designed systems.
S.Y. B.Sc.	Electronic Instrumentation	CO1. This is the practical course, where the actual basic principles are implemented nd some laws and
Semester-I		a theorems are verified in a systematic way.
		CO2. This course helps in understanding of the electronic fundamentals and it helps in building student

		interest as well.
		CO3. The course is divided into two sections as simply analog and digital.
		CO4. The students have an experience to observe and handle various components and Instruments in the Lab
		CO5. The main outcome of this course is to design the electronic circuit using particular components.
		CO6. Testing and measuring is the act of knowing the components and devices which Increases student enthusiasm in the practical field.
		CO7. Analysis and verification makes complete platform for concept clarity.
	Analog Circuit Design	CO1. This course introduces various analog circuits.
		CO2. The basic designing aspects for analog electronic system are introduced.
		CO3. The basic principles of amplifiers and oscillators are introduced, which gives idea about their applications.
		CO4. This course develops analog system designing skills among the student, which leads to develop their knowledge of analog circuits in different applications.
Semester-II	Electronic Instrumentation Paper-I	CO1. This course leads to study block diagrams of different electronic instrumentation and equipments like DMM, CRO, signal and function generators.
		CO2. The more stress is on the understanding of the working principles of popular instruments.
		CO3. In this course students are getting the knowledge of specifications of various instruments in the technical way.
		CO4. The main outcome of this course is to learn the operating procedure of instruments.
		CO5. Through this course, students come in familiar with advance technologies like PSTN, dish antenna, internet, video conferencing etc
	Communication Electronic Paper-II	CO1. This course deals with study of basics of communication systems and telephone
	Practical Design	CO1. This course assumes the prior knowledge of basic digital electronics and explains various topics in digital circuit design.
		CO2. This course deals with the design aspects of various combinational and sequential circuits.
		CO3. Data converters come across analog and digital conversions and knowledge of interfacing in many electronic systems.
		CO4. This course also gives theoretical designing using k-map for simplification of various electronic circuits in mathematical way.
Department of Statistics		
F.Y. B.Sc. (Annual)	Descriptive Statistics Paper-I	CO1. Building of different electronic circuits for specific applications is the main aspect of this course.
		CO2. Knowledge and use of graphical technique and interpret
		CO3 Computation of various measures of central tendency, Dispersion, Skewness and Kurtosis.

		CO4. Compoutation of the correlation coefficient for bivariate data and interpret it.
		CO5. Analysis of data pertaining to attributes and to interpret the results.
		CO6. Summary and analysis of the data using computer.
		CO7. Application of statistics in the various field.
	Discrete Probability	CO1. Comparison between random and non-random experiments.
	And Probability Distribution Paper-II	CO2. Finding the probabilities of events.

		CO3. Obtaining the probability distribution of random variable (one or two dimensional) in the given situation ,and
		CO4. Application of standard discrete probability distribution to different situation.
	Practical Course Paper-III	CO1. Computation of the various measures of central tendency, Dispersion, Skewness and Kurtosis.
		CO2. Computation of the correlation coefficient, regression coefficients.
		CO3. Fitting the binomial distribution.
		CO4. Analysis data pertaining to discrete and continuous variables and to interpret result.
		CO5. Computing the probabilities of bivariate distributions.
		CO6. Interpretation of summary statistics of computer output.
S.Y.B.Sc.	ST-211 Discrete Prob.Distri.	CO1. Study of discrete probability distributions.
Semester-I	Time series and R-software ST-221-	CO2. Knowledge and study of different component of time series and analyze time series data.
	Statistical Methods Paper-I	CO3. Knowledge and study of different command of R-Software to analyze the statistical data.
		CO4. Knowledge and study of multiple regression and multiple and partial correlation coefficients.
		CO5. Application of statistics in the field demography.
		CO6. Testing of the hypothesis particularly about mean, variance, correlation, proportions.
	ST-212 Continuous probability	CO1. Study of the standard univariate continuous probability distributions.
	Distributions. ST-222 Sampling	CO2. Knowledge and study of bivariate continuous probability distributions.
	istributions And Inference	CO3. Study of exact sampling distributions (Chi-Square, t, F).
	Paper- II	CO4. Testing of the hypothesis particularly about mean (unknown population variance), variance, goodness of fit and independence of attributes.
	Practical Course Paper- III	CO1. Computing the multiple and partial correlation coefficients, trivariate multiple regression plane, to find residual sum of squares and adjusted residual sum of squares. (using calculators and MSEXCEL), fit various discrete and continuous distribution, test the goodness of fit, to draw model samples (using calculators and MSEXCEL).
		CO2. Testing the various hypothesis included in theory.
		CO3. Analysis of the time series data.
T.Y.B.Sc	Paper I Distribution Theory (ST:331)	CO1. Knowledge and study of standard univariate & bivariate continuous probability distributions like Beta Distribution .
		of first and 2nd type, Laplace, Cauchy, Weibull & Bivariate normal distribution type, Laplace, Cauchy, Weibull & Bivariate normal distribution.
		CO2. Knowledge and study of probability distributions of different Order statistics.

	Paper II Actuarial Statistics (ST:341)	CO1. Develop a High quality training in Actuarial statistics locally and internationally.
		CO2. Provision of an opportunity for research in actuarial statistics and development of Insurance (n-year term life insurance, Endowment Insurance, Whole life insurance) product.
		CO3. Knowledge and study of Annuities (Annuity certain, Annuity Immediate, Discrete life annuities).
		CO4. Knowledge and study of Premiums for a variety of insurances products
	Paper II Estimation Theory (ST:332)	CO1. Knowledge and study of point and interval estimation methods for making inferences about unknown population parameters on the basis of samples.
		CO2. Study and estimation of methods like Method of moments & Maximum likelihood method.

		CO3. Study of different criterion of estimators like unbiasedness, variance of the estimator (UMVUE and MVBUE), Sufficiency, Efficiency, Consistency.
		CO4. Study of interval estimation
	Paper III Testing of Hypotheses (ST:342)	CO1. Knowledge and study of parametric tests :- MP, UMP tests, Likelihood ratio tests and sequential probability ratio tests (SPRT).
		CO2. Study of Non- Parametric tests:- Sign test, Wilcoxon signed rank test, Mann-Whitney test,Run test and Kolmogorov-Smirnov test.
	Paper IV Sampling Methods (ST:333)	estimation of standard error.
		CO2. Knowledge and study of determination of sample size.
		CO3. Knowledge and study of the role of sample survey in research methodology.
	Paper V Statistical Quality Control (ST:343)	CO1. Knowledge and study of online and offline process control methods.
		CO2. Knowledge and study of control chart for variables (X-bar, R-chart) and Attributes (P-chart, C-chart)
		CO3. Knowledge and study of capability, capability ratio, capability indices (Cp and Cpk).
		CO4. Knowledge and study of acceptance sampling plans for attributes.
	Paper VI Design Of Experiments (ST:334)	CO1. Knowledge and study of the ANOVA: Concepts and Techniques.
		CO2. Study and knowledge of different design of experiments like CRD,RBD and LSD.
		CO3. Study and knowledge of efficiency of design (RBD over CRD, LSD over CRD and LSD over RBD)
		CO4. Study and knowledge of analysis of covariance in CRD and RBD.
		CO5. Study and knowledge of factorial experiments and confounding (Total and Partial).
	Paper VII Operations Research (ST:344)	CO1. Study and knowledge of formulation of linear programming problems (LPP).
		CO2. Study and knowledge of graphical method for obtaining optimal solutions to LPP.
		CO3. Study and knowledge of simplex method, Big-M method and Duality for obtaining optimal solutions to LPP.
		CO4. Study and knowledge of Transportation Problem (T.P.) and Assignment Problem (A.P.).
		CO5. Study of Critical Path Method (CPM) and Project Evaluation and Review Techniques (PERT).
	Paper VIII C Programming (ST:335)	CO1. Study basic concepts of C- language.
		CO2. Development of logic and programming skills.
		CO3. Development of various C programs for descriptive statistics and C programs for correlation coefficient and regression equation.
	Paper IX Stochastic Process. (ST:345)	CO1. Study of finite Markov chain and transition probability matrix.

		CO2. Study of classification of states (Recurrent, transient and ergodic) .
		CO3. Knowledge and study of periodicity of Markov chain and stationary distribution.
		CO4. Knowledge and study of Poisson process and Compound Poisson process.
	Paper X Regression analysis (ST:336)	CO1. Explanation of variability in dependent variable by means of one or more independent variable.
		CO2. Estimation of the least square parameters of simple, multiple and logistic regression equation and i.
		nterpret parameters
		CO3. Estimating the parameters of weighted least squares and interpret residual plot.

	Paper XI Statistical computing	CO1. Knowledge and study of the basic concepts of R- Software and graphical presentation of data using R- software.
	using R-Software (ST:346)	CO2. Study different measures of central tendency, dispersion, Coefficients of skewness, kurtosis, correlation, regression and probability and probability distributions using R- Software.
		CO3. Study parametric and non- parametric tests using R –Software.
	Paper XII Practical Paper -I (ST:347)	CO1. Fitting the lognormal distribution and model sampling from Cauchy and Laplace distributions.
	Paper XIII Practical Paper -II (ST:348)	CO2. Testing the parametric and non- parametric hypotheses.
		CO3. Estimation of population mean, population total and population proportion with standard errors using Sampling methods.
		CO4. Construction of life tables and computation of benefit premiums for insurance products
Department of Chemistry		
F.Y.B.Sc. Annual	Physical and Inorganic Chemistry Paper: I	CO1. Knowledge of the various properties of states of matters.
		CO2.Understanding of the dynamic nature of surface and its applications in catalysis and nanoscience.
		CO3.Application of the mathematical formulation to chemical science.
		CO4. Solve stoichiometric calculations to different chemical reactions.
		CO5.Memorize development of atomic theory.
		CO6.Apply the entropy concept to second and third law of thermodynamics.
		CO7.Understand the concept of hybridization.
		CO7.Numericals based on related topics.
	Organic and Inorganic Chemistry Paper: II	CO1Discuss the structure and reactivity of organic Molecules.
		CO2.Find out aromatic /non aromatic characters.
		CO3.Outline the chemistry of s and p-block Elements.
		CO4.Write electronic configuration of element.
		CO5.Predict the conversion of functional group.
		CO6.Explain the concept of geometrical isomerism.
	Chemistry practical	CO1. Calibrate the apparatus like volumetric flask, pipette and burette.
		CO2. Understand the determination of heat of solution, equivalent weight.
		CO3. Perform qualitative analysis of organic compounds.
		CO4. Carry out qualitative analysis of acidic and basic radicals.
		CO5. Carry out quantitative analysis by volumetric method and gravimetric methods.
		CO6. Carry out quantitative analysis by volumetric method.

		CO7. Learn the applications of types of titrations for various estimations.
		CO8. Handle viscometer to determine the viscosity and relative viscosity of liquids.
S.Y.B.Sc.	Physical and Analytical	CO1.Understand the concept of concept of kinetics, terms used, rate laws, types of order
	Chemistry Paper:I	CO2.Understand the mathematical equation of first order and second order reaction.
	Semester -I CH-211	CO3.Know types of photochemical reactions and concept of quantum yield.
	Semester-II CH-221	CO4.Extraction of solute from two immiscible solvent.
		CO5.Elucidation of composition diagram.

		CO6.Classify the common analytical techniques.
		CO7.Understand errors and its interpretation.
		CO8.Outline the basic principles in qualitative analysis.
		CO9.Numericals based on related topics.
	Organic and Inorganic	CO1.Understand the concept of stereoisomerism.
	Chemistry Paper:II	CO2.Able to suggest the possible synthetic routes of chemical reaction.
	Semester -I CH-212	CO3.Answer the importance and chemistry of different biomolecules
	Semester-II CH-222	CO4.Identify the different reagents in organic synthesis.
		CO5.Classify heterocyclic compounds.
		CO6.Understand the importance of biochemistry
		CO7.Know physico-chemical principles involved in electrometallurgy.
		CO8.Understand electrolysis of alumina, refining its alloys.
		CO9.Know differentiate between properties of pig iron, wrought iron and steel.
		CO10.Understand term corrosion, its type, mechanism and factors affecting corrosion.
		CO11.Know Methods of prevention of metal from corrosion.
		CO12.Outline the chemistry of d-block Elements.
		CO13.Understand M-C bond, organometallic compounds and its synthesis.
		CO14.Know toxic chemical in the environment and impact on human health.
	Practical Course in Chemistry	CO1. Verify theoretical principles experimentally.
	(CH – 223)	CO2. Acquire skill of crystallization, record correct m. p. / b. p
		CO3.Perform the complete chemical analysis of the given organic compound and should be able to recognize the type of compound.
		CO4. Write balanced equation for all the reactions, they carry in the laboratory.
		CO5. Perform the given organic preparation according to the given procedure.
		CO6. Follow the progress of the reaction by using TLC technique.
		CO7. Set up the apparatus properly for the given experiments.
		CO8. Perform all the activities in the laboratory with neatness and cleanness
T.Y.B.Sc.	Physical Chemistry Paper: I	CO1.Apply mathematical equation for order of reaction.
	Semester -I CH-331	CO2.Estimate the energy of activation and order of reaction.
	Semester-II CH-341	CO3.Understand the Interionic Attraction theory.
		CO4.Study basic terms and subject application in molecular spectroscopy.
		CO5.Use of different spectra for understanding of molecular structure.
		CO6.Understand the phase rule and terms involved in it.
		CO7. Knowledge of the electrochemical cell and conventions.
		CO8.Understand the relationship between thermodynamics and EMF.

		CO9. Understand the fundamentals of radiochemistry and its applications.
		CO10. Be able to understand Crystal system and their characteristics.
		CO11. Understand the concept of quantum chemistry
		CO12. Numerical problems based on topics.
	Course: Inorganic Chemistry Paper: II	CO1. Differentiate AO's and M.O's, BMO and ABMO, VBT and MOT

	Semester -I CH-332	CO2.Draw of molecular orbital and calculate bond order and explain stability.
	Semester-II CH-342	CO3.Know the various types of Ligands and meaning of the terms used in co-ordination chemistry
		CO4.Classify the various types of isomerism.
		CO5.Explain different complexes, electro neutrality principle and multiple bonding
		CO6.Know Strong field and weak field splitting, calculation of CFSE and evidence of CFSE.
		CO7.Explain Charge transfer Spectra, John- Teller distortion, spectrochemical and nepheluxetic series.
		CO8.Draw M.O. diagram of complexes on the basis of MOT.
		CO9.Outline the chemistry of f-block Elements.
		CO10.Know biological role of inorganic ions & compounds.
		CO11.Understand M-C bond, organometallic compounds
		CO12.Explain semiconductor and superconductor
		CO13.Draw n (E) & N (E) Curves and difference between metal semiconductor and insulator on basis of n (E) & N (E) Curves
		CO14.Understand defects in solids.
	Course: Organic Chemistry Paper: III	CO1.Compare the strength of organic acids and Bases
	Semester -I CH-333	CO2.Draw the conformational isomers and compare its stability.
	Semester-II CH-343	CO3.Understand stereochemistry of substitution reactions
		CO4.Learn the mechanism of nucleophilic and Electrophilic substitution reactions
		CO5.Compose synthetic applications of some important synthetic reagents
		CO6.Understand the Retrosynthetic analysis
		CO7.Know the importance of different spectroscopic methods in structure determination of organic compounds.
		CO8.Applications of UV-VIS, FT-IR and NMR spectroscopic methods
		CO9.Numericals on UV-VIS,FT-IR and NMR spectroscopic methods
	Course: Analytical Chemistry Paper: IV	CO1.Understand the principles of common ion effect and solubility product
	Semester -I CH-334	CO2.Conceptual understanding of electrogravimetric principle.
	Semester-II CH-344	CO3.Explain methods of thermo gravimetric analysis.
		CO4.Demonstrate the applications of Spectrophotometric analysis.
		CO5.Apply different analytical techniques for analysis.
		CO6.Understand the efficiency of solvent extraction.
	Course: Industrial Chemistry Paper: V	CO1.Memorize the modern approach to chemical industry.
	Semester -I CH-335	CO2.Describe the scope of agrochemicals.

	Semester-II CH-345	CO3.Discuss the preservation and processing of foods.
		CO4.Names the Fuels and eco-friendly fuels and use of solar energy.
		CO5.Understand nutritive aspects of food constituents
		CO6.Recognize importance of different industries.
		CO7.Understand basic concept of polymer.
		CO8.Explain importance of Sugar Industry in India.
		CO9.Define pharmaceutical terms.
		CO10.Outline the problems of pollution and deposal of waste of various industries.

		CO5.Students learn about the Indians nuclear energy programme.
		CO6 Explain spectra and relate the observations to electronic, molecular and dynamic processes occurring in the samples.
		CO7.Able to account for spectroscopic methods in different energy intervals.
		CO8.Interpret the basic processes associated with molecular phenomena.
		CO9.Use optical spectroscopy to study the structure and orientation of molecules adsorbed on surfaces.
		CO10.Justify the difference in intensity between Stokes and anti-Stokes lines.
		CO11.Explain the concept of crystallography and apply it to different crystal structures.
		CO12.Understand the molecular spectroscopy: I.R, Raman, electronic and Mossbauer and its application.
	Inorganic Chemistry	CO1. Understand the details of molecular symmetry including symmetry elements, operations and symmetry point groups.
	Semester -I CHI-130	CO2. Use of group theory to recognize and assign symmetry characteristics to molecules.
		CO3.Understand the mathematical basics needed for group theory, including matrices, reduction formula, reducible and irreducible representations.
		CO4. Apply group theory in valence bond theory treatment of structure and bonding.
		CO5. Apply group theory in molecular orbital theory treatment of bonding and structure.
		CO6. Apply group theory to predicting concerted organic reactions.
		CO7. Explains the trends in atomic and physical properties of group elements.
		CO8.Understand the concept of vibrational modes.
		CO9.Calculate the number, the symmetry and the form of normal modes of vibrations.
		CO10.Use group theory to predict how many of these modes will contribute to the spectrum and their polarization.
		CO11.Extract molecular information from vibrational spectra.
		CO12.Able to known phenomenon of symmetry and its importance.
	Inorganic Chemistry	CO1.Understand the fundamental principles of main group organometallic chemistry.
	Semester -II CHI-230	CO2.Able to use Crystal Field Theory to understand the magnetic properties of coordination compounds.
		CO3.Able to describe the stability of metal complexes by the use of formation constants .
		CO4.Able to recognize the types of isomers in coordination compounds.
		CO5.Familiarization with some applications of coordination compounds.
		CO6.Understand how metal ions interact with biological environments and how these interaction influences the properties of metal centers.
		CO7.Apply principles of coordination chemistry to explain how nature tailors properties of metal centers for specific applications.
	Organic Chemistry	CO1. Predict the reactivity of an organic compound from its structure.
	Semester -I CHO- 150	CO2. Develop basic skills for the multi-step synthesis of organic compounds.
		CO3. Know the different aromatic substitution processes and their application to heteroaromatic systems.

		CO4. Describe synthetically the processes relevant organic-chemical reactions and be able to discuss the mechanism of these reactions.
		CO5. Assign configurations to relevant stereochemical elements in molecular structures and predict stereochemical outcomes in organic reactions.
		CO6. Differentiate chiral and achiral molecules.
		CO7. Identify the stereocenters in a molecule and assign the configuration as R or S.
		CO8. Know the relationship between enantiomers and their specific rotations.
		CO9. Predict the energetically preferred conformation for straight-chain and branched alkanes, and for substituted cycloalkanes.
	Organic Chemistry	CO1. Know the basic mechanism of oxidation in organic compounds.
	Semester -II CHO-250	CO2. Acquire knowledge about the reagents which causes oxidation in various compounds

Geography M.A Arts Faculty.

M.A –I Sem-I	Principles of geomorphology	CO1 Student understood the history of geomorphology and studies geological time scale.
		CO2 Student understood the interior of the earth with various sources and theories like Isotasy.
		CO3 Student able to define weathers of mass movements in nature.
M.A-I (Sem-II)	Practical's of serving	CO1 Student know the difference between geodetic and plane survey.
		CO2 Students learnt terms used in leveling like spot hight.
		CO3 Student able to identified the parts of dumpy levels.
M.A-I (Sem-I)	Principals of climatology	CO1 Student learnt the nature ,scope , sub-divisional development.
		CO2 Student understands the atmospheric Composition and structure.
		CO3 Student were aware the atmospheric motion.
M.A._I (Sem-I)	Principles of economic geography	CO1 Understood nature and scope of economic geography.
		CO2 Student understood formation and testing of hypothesis.
		CO3 Students understood various types of economics such as homestead and tribal.
M.A._I (Sem-I)	Principles of population.	CO1 Student understood the evaluation of settlement and population geography.
		CO2 Student learnt various factors influencing the growth and distribution.
		CO3 Student understood the various factors in influencing the dispersion and nucleation.
M.A._I (Sem-I)	Practices in Physical Geography	CO1 Student learn the drainage network and drainage stream.
		CO2 Students understood few climatic elements.
		CO3 Student understand the few climatic classification schemes.
M.A._I (Sem-I)	Particles in human geography	CO1 Student learn the crop combination method by weavers.

		CO2 Student acquired the knowledge measure the network indices & Ratio measure
		CO3 Student aware the method of calculations of urban data.
M.A. _I (Sem-II)	Quantitative techniques in geography	CO1 Students introduced about geographical data.
		CO2 Student understood the analytical methods of descriptive statistics.
		CO3 Student learnt concept of probability and methods of determination.
M.A. _I (Sem-II)	Particles in cartography	CO1 Student learnt the data representation by various techniques and data measurement.
		CO2 Student aware about the plotting the semi log on X & Y with whisker.
		CO3 Student learnt fundamental concepts of Math projection definition.
M.A. _I (Sem-II)	Geography of tourism	CO1 Student learnt the basic concept of tourism geography.
		CO2 Student learnt the types of tourism & Adventure of Tourism.
		CO3 Student learnt impact of tourism physical economic and social tourism.
M.A. _I (Sem-II)	Geography of Disaster management	CO1 Students introduced the concept and definition of disaster.
		CO2 Student understood the classification of disasters.
		CO3 Student understood the impact of disaster.
M.A. _I (Sem-II)	Geo -informatics -I	CO1 Student learnt basic of GIS history of GIS & element of GIS.
		CO2 Student understood special relationships, functional relationships and logical relationships.
		CO3 Student studied geometric primitives raster, vector. quad treeetc
M.A. _I (Sem-II)	Geo-informatics-II	CO1 Student learnt field work and survey published data and reports.
		CO2 Student studied the principles of remote sensing.
		CO3 Student understood atmosphere and surface.
M.A. _I (Sem-II)	Population geography	CO1 Student learnt the nature and scope of population geography.
		CO2 Student studies various factors of affecting growth on population theories.
		CO3 Student learnt various factors affecting on distributions of world population.
M.A. _I (Sem-II)	Geography of rural settlement	CO1 Students studied evaluation of settlement.
		CO2 Student understood various factors of affecting site of distribution and growth of settlement
		CO3 Student learnt various rural services.
M.A. _II (Sem-II)	Geography of India with special references of Maharashtra.	CO1 Student introduced about geography of India and Maharashtra.
		CO2 student learnt the physiography of India And Maharashtra.

		CO3 student aware of climate of India and Maharashtra.
M.A-II Sem-III	Interpretation of topographical maps and village survey.	CO1 Student learnt Interpretation of topographical maps and village survey.
		CO2 Student understood the location of village extension and physical future
		CO3 Students understood how to fill the questionnaire in the village survey
M.A-II Sem-III	Research method in geography	CO1 Student introduced about surveying and map projections.
		CO2 Student learnt about the creation of database of physical and cultural features.
		CO3 Student understood geometry of aerial photographs and database creations.
M.A-II Sem-III	Social and cultural geography	CO1 Student understand the nature and scope ,definition of social and cultural geography
		CO2 Student aware the basic concept of materialism and discussion of culture.
		CO3 student understand social well being quality of life and human development.
M.A-II Sem-III	Practical of watershed analysis	CO1 Student learnt delineate the water shed from toposheet.
		CO2 Student calculated the basin perimeter, shape and area.
		CO3 Student calculated linear aspects of drainage basin.
M.A-II Sem-III	Urban Geography	CO1 Student understand the nature and scope and definition of urban geography.
		CO2 Student understood the few theories of urban geography like centre place
		CO3 Student understand the concept of urbanization and urban demography.
M.A-II Sem-III	Political Geography	CO1 Student learnt nature and scope of political geography.
		CO2 Student studied various approach to study of political geography.
		CO3 Student understand the concept of nation , state and nation building. .
M.A-II Sem-III	Practical in population and settlement geography	CO1 Student leant various demography Indices such as mortality.
		CO2 student understood demographic transactions applied to Mahara shtra.
		CO3 Student studied the various indices related settlement geography.
M.A-II Sem-IV	Theoretical and applied geography	CO1 Student learnt different Geographers such as Greek,Roman & Indian.
		CO2 Student understand the paradigms , systems and models and types.
		CO3 Student understood from this topc field survey.
M.A-II Sem-IV	Principles of remote sensing	CO1 Student understood definition, history and principles of development.
		CO2 Student understood concept of radiation principles.
		CO3 Student understood platforms types of their charaterstics.
M.A-II	Practical in remote sensing &	CO1 Student understand the basic concept of remote sensing & GIS.

Sem-IV	GIS	
		CO2 Student understand principle point, fiducial marks
		CO3 Student prepare the packet and mirror stereoscope to interpretation of aerial photograph.
M.A-II Sem-IV	Geography of food security	CO1 Student learnt the economic growth factors affecting food security.
		CO2 Student acquired the knowledge of food justice.
		CO3 Student learnt food security bill 2013
M.A-II Sem-IV	Geography of health	CO1 Student understand the definition and development & achievement of health geography.
		CO2 Student understand the geographical factor attending human health
		CO3 Student understood the health care system in India.
M.A-II Sem-IV	Regional geography of SAARC countries	CO1 Student introduced about history of SAARC organization.
		CO2 Student understood geography of India .
		CO3 Student learnt geography of Pakistan & Bangladesh.
M.A-II Sem-IV	Natural and manmade Hazards	CO1 Student introduced about natural hazards and disasters.
		CO2 Students understood climatic hazards, storms ,drought and floods.
		CO3 Student learnt geological hazards.
M.A-II Sem-IV	Principles of regional geography & project work	CO1 Student understood the concept of regional geography, regionalization and planning.
		CO2 Student understood central place theory and growth pole
		CO3 Students worked on various projects and presented.

		CO3. Know the reagents that causes selective and complete reduction
		CO4. Interpret ^1H NMR, ^{13}C NMR, IR, UV, and mass spectra and use these data to determine the structure of organic molecules.
		CO5. Predict the relative energies of reactive intermediates such as radicals, carbocations, and carbanions, based on structural considerations such as orbital hybridization, hyperconjugation, and resonance stabilization.
		CO6. Describe stereochemical problems in relation to chemical transformations.
		CO7. Correlate the chemical structure of biomolecules to reactivity: Functional groups, acid-base properties, Biochemical as well as synthetic routes.
		CO8. Describe different approaches to the formation of carbanions; discuss their structures, Stabilities/reactivates and applications in synthesis.
		CO9. Student should be able to plan syntheses using carbanions as nucleophilic
		CO10. Explain the origins of the observed diastereoselectivity.
	Course: General Chemistry	CO1. Demonstrate safe handling of chemicals and equipment in the laboratory.
	Semester -I CHA- 190	CO2. Demonstrate knowledge of Good Laboratory Practices, Good Manufacturing Practices and Fire Safety.
		CO3. Define the principles involved in analytical chemistry.
		CO4. Apply suitable method of analysis for a given analytical determination.
		CO5. Describe the fundamentals of separation techniques.
	Course: General Chemistry	CO1. Apply a fundamental understanding of the tools of optical spectroscopy.
	Semester -II CHA-290	CO2. Demonstrate an understanding of the interactions of electromagnetic radiation with matter in the analysis of papers from the current scientific literature.
		CO3. Demonstrate a basic understanding of a range of state-of-the-art spectroscopic techniques that will be surveyed in the latter part of the course.
		CO4. Able to explain the principles of the most important liquid and gas chromatography as well as electro-migration techniques;
		CO5. Able to understand principles and their practical application in publications describing chromatography or electro-migration techniques;
		CO6. Describe in detail the principles governing chromatographic separations.
	Physical Chemistry Practical-I	CO1. Apply the research-based knowledge for various instrumental applications
	CHP-107	CO2. Understand the principles and working of Potentiometer and determine stability constant of a complex ion by potentiometry.
		CO3. Determine concentration of unknown solutions and degree of hydrolysis and hydrolysis constant by pH-Metry.
		CO4. Use Dilatometer for kinetic study.
		CO5. Determine specific rotation and percentage of two optically active substances by polarimetrically.
		CO6. Apply statistical treatment for experimental data.

	Inorganic Chemistry Practical-II	CO1. Perform gravimetric and volumetric analysis for ores and alloy.
	CHI-127	CO2. Analyze binary mixtures by gravimetric and volumetric method.
		CO3. Synthesize the metal complexes and find out the percentage purity.
		CO4. Understand and Perform ion exchange chromatographic technique for separation of metal ion.
		CO5. Synthesize and characterize nanoparticles by different analytical techniques.
		CO6. Apply Conductometric method for verification of Debye Huckle theory.
	Organic Chemistry Practical-III	CO1. Know uses of chemistry software's like MOPAC, ISIS draw, Chem office.
	CHO-247	CO2. Understand and demonstrate different purification techniques.

		CO3. Perform thin layer chromatography technique for completion of reaction.
		CO4. Perform single and two stage preparation.
		CO5. Apply knowledge of Green principle for organic synthesis.
		CO6. Apply Microscale Techniques for the separation of three component mixture using ether.
M.Sc.-II	Electrochemical and Radio Analytical	CO1. Demonstrate safe handling of chemicals and equipment in the laboratory.
(Analytical Chemistry)	Methods of Analysis	CO2. Proficiency in professional sampling and sample treatment prior to analysis.
	Semester-III CHA- 390	CO3. Capability of treatment and evaluation of the results of analysis.
		CO4. Understanding and capability of performing basic chemical processes in an analytical laboratory.
		CO5. Capability of performing measurements on basic analytical instruments.
		CO6. Develop and apply methods for separating chemical compounds in mixtures using chromatography.
	Pharmaceutical Analysis	CO1. Apply various analytical techniques to drug analysis and control.
	Semester-III CHA- 391	CO2. Apply various analytical methods assessing the purity of formulations.
		CO3. Assess stability of pharmaceutical products, active ingredients, excipients and compounds like preservatives, taste and smell improving agents.
		CO4. Examine the reliability of various techniques in Pharmaceutical Analysis, including statistical processing.
		CO5. Use the Pharmacopoeia in drug analysis and control.
		CO6. Apply techniques for artificial ageing of pharmaceutical products or active materials, and accelerating ageing techniques.
	Advances in Analytical Techniques	CO1. Understand the theoretical principles behind modern analytical instrumentation.
	Semester-III CHA- 392	CO2. Develop a range of laboratory skills relating to instrument operation, observation and measurement, appropriate to final year studies.
		CO3. Process data sets produced from some instruments
		CO4. Report in detail on a chosen technique and on analysis of the data.
		CO5. Understand and perform a suite of statistical techniques.
		CO6. Evaluate data sets using appropriate techniques.
		CO7. Assess quality of data needed to obtain specific goals.
	Analytical Method Development & Validation; Geochemical & alloy Analysis	CO1. Understand the purpose of analytical method validation and the principles of measurement uncertainty.
	Semester-III CHA- 380	CO2. Define the parameters used for method validation.
		CO3. Able to know the validation characteristics as per ICH Q2(R1) .
		CO4. Generate a validation, verification or transfer protocol, as appropriate, including practically relevant experiments and acceptance criteria.
		CO5. Interpret the results of validation, verification and transfer studies using appropriate statistics.

		CO6. Understand the different possible approaches that may be used for analytical method transfer as
		per available guidance from EMA, USP <1224>, FDA and WHO.
		CO7. Review analytical procedures in terms of transfer to another laboratory and identify potential problems.
		CO8. Develop an understanding of the fundamental science that underpins a range of inorganic geochemistry
		Tools for Earth Scientists.
		CO9. Appreciate the processes that are required to extract accurate geochemical data from natural samples.
		CO10. Acquire skills in computer programming.
		CO11. Develop an understanding of a range of data processing/analysis techniques and the ability to determine

		suitable data analysis approaches to test hypotheses.
		CO12. Be able to identify suitable scientific objectives that can be addressed with geochemical measurements, and suitable data analysis.
	Analytical Toxicology and Forensic Science	CO1. Discuss classification and significance of ‘drugs of abuse’ and critically evaluate methods available for their detection and analysis
	Semester-IV CHA- 481	CO2. Explain the effects of adsorption, distribution, metabolism and excretion of foreign compounds on responses to toxic compounds and apply these principals to the metabolism and forensic analysis of drugs of abuse.
		CO3. Explain the application of palynology, osteology and other forensic indicators in the interpretation of the time frame of events and identification of individuals in forensic investigations.
		CO4. Discuss advancements and new concepts in forensic analysis and apply these to the wider application of forensic biology.
	Analytical Spectroscopy	CO1. Understand the concept of different spectroscopic techniques.
	Semester-IV CHA- 490	CO2 Able to know the principle and instrumentation of electron spectroscopy, chemiluminescence, fluorescence and phosphorescence, surface characterization techniques and XRD.
		CO3. Understand applications of spectroscopic techniques.
		CO4. Distinguish the specialties and applications of various types of spectroscopic methods.
	Analytical methods for Analysis of fertilizers, detergents, Water, and Polymer, Paint and pigment	CO1. Explain general scheme of analysis for soap with different parameters.
		CO2. Estimate the different constraints from synthetic detergent
		CO3. Understand concept of different test for paints and pigments
		CO4. Differentiate the plasticizers, binders and thinners.
	Semester-IV CHA- 491	CO5. Describe the types of petroleum products and identify it by different methods.
		CO6. Understand concept and classification of polymer.
		CO7. Able to different types of polymerization techniques.
		CO8. Understand concept of chemical analysis of polymer based on different instrumental techniques.
		CO9. Generalize the properties of electrical, optical and chemical polymers.
		CO10. Understand the concept of end group analysis of polymers.
	Method of Analysis and Applications	CO1. Demonstrate the sampling methods for collection of blood and urine sample.
	Semester-IV CHA- 492	CO2. Estimate the different constituents from blood and urine sample.
		CO3. Classify the different types of human nutrients.
		CO4. Analyze the carbohydrates from human nutrients by different methods.
		CO5. Appraise the lipids from human nutrients by different methods.

	Analytical chemistry Practical Course –I	CO1. Understand the principles and applications of modern chemical instrumentation, experimental design, and data analysis.
	CHA-387	CO2. Apply statistical methods of data analysis including error distributions, hypothesis testing, confidence intervals, the method of maximum likelihood or least-squares analysis.
		CO3. Students will be able to analyze pharmaceutical and commercial products and determine the proper repair procedure required.
		CO4. Students will be able to apply proper safety procedures.
		CO5. Student will be able to analyze samples qualitatively and quantitatively by proper instrumentation

	Analytical Chemistry Practical Course-II	CO1. Make accurate chemical analyses using a variety of instrumental techniques.
	CHA-487	CO2. Describe their findings clearly and concisely in writing, including interpretation of results and statistical analysis.
		CO3. Present data in graph and/or tabular formats effectively.
		CO4. Apply what they have learned about instrumental analysis to carry out a new procedure of their own design.
		CO5. Explain observations made during the course of an experiment.
		CO6. Discuss how experimental variables affect the outcome of a measurement.
		CO7. Identify appropriate instrumental methods for given chemical analysis problems, taking into account such
		CO8. factors as sample type, interferences, sensitivity, and selectivity.
		CO9. Identify and resolve problems when they arise in analyses.
	Analytical Chemistry Practical Course-III	CO1. Explain and demonstrate a range of analytical techniques.
	CHA-488	CO2. Discuss and describe the theoretical background on which these techniques are based.
		CO3. Operate analytical techniques used in the analysis of pharmaceuticals & carry out pharmaceutical assays.
		CO4. Demonstrate an appreciation of the commercial significance and application of these analyses.
		CO5. Implement methodologies for the regulation and control of pharmaceutical quality
		CO6. Comprehend and apply quality control measures in pharmaceutical analysis.
		CO7. Critically evaluate a variety of methods of analysis for food
		CO8. Perform measurement, analysis and assessment of a range of food analytes
		CO9. Comparatively evaluate the application of selected instrumental methods for the
		CO1. Students express their creativity and develop higher order thinking skills.
	Research Project	CO1. Search the Literature survey for the project
	CHA-488	CO2. Use analytical instrumental to carry out the project
		CO3. Develops an aptitude for doing research.
		CO3. Team work gives more innovative ideas.
		CO4. Handle analytical instruments neatly for analysis and discuss their experiment results.
		CO5. Know specification of instrumental techniques and interpretation data.
		CO6. Write project reports and Power point presentation using ICT tools
Department of Zoology		
F.Y. B.Sc. (Annual)	(ZY 101) Animal Systematics and Diversity I (Section-I) Paper I.	CO 1 Study of principles of classification: Systematics, Binomial nomenclature, five kingdom classification system.
		CO 2. Study of Salient features and classification of invertebrate phyla like Protozoa, Porifera, Coelenterata,

		Platyhelminthes, Aschehelminthes and Annelida.
		CO 3. Study of Paramoecium related to systematic position, structure, nutrition, excretion and reproduction.
		CO 4. Study of earthworm related to systematic position, characters, body systems and economic important's.
	Animal Systematics and	CO1. Salient features and classification of some protochordates like Hemichordata, Urochordata and
	Diversity II (Section-II)	Cephalochordata.
		CO 2. Salient features of class Pisces and Amphibian.
		CO 3. Study of frog in related to systematic position, external characters and systems like digestive, circulatory
		CNS and reproductive system.

		CO 4. Study of some classes with specific characteristics like migration in fishes, neoteny and parental care in amphibians.
	(ZY 102) Fundamentals of	CO1. Study of the concepts of cell Biology.
	Cell Biology (Section-I) Paper II.	CO 2. Study of the scope of Cell Biology.
		CO 3. Study of cell structure and cell functions.
		CO 4. Study of broad description of bio-chemistry of cell, structure & functions of cell organelles.
		CO 5. Study of cell biology with its concern aspects scientifically.
		CO 6. Study of the cellular activities.
		CO 7. Study of significance of cell & its molecular activities.
		CO 8. Study of cancer cell & cancer causing agents.
	Genetics (Section-II)	CO1. Study of fundamentals of Genetics, Mendelian ratios & modified Mendelian ratios.
		CO2. Study of awareness about Heredity & Inheritance of traits/ disease.
		CO3. Study of chromosome, its types and structure.
		CO4. Study of applications of genetics.
S.Y.B.Sc. Semester-I	ZY- 211 Animal Systematics and Diversity III Paper-I	CO 1. Study of invertebrate phyla like Arthropoda, Mollusca & Echinodermata
		CO 2. Study of Arthropoda, Mollusca Echinodermata with reference to their specific characteristics like mimicry larval forms, shell and foot modification and pedicellariae.
		CO 3. Detailed study of morphology and physiology of various system of <i>Asterius</i> .
	ZY- 212 Applied Zoology	CO 1. Study of different types of fisheries and ponds.
	(Fisheries & Agricultural Pests	CO 2. Study of culture of freshwater fishes like Rohu, Catla, Mrigal and Prawn.
	and their Control) Paper II	CO 3. Study of harvesting methods of some marine forms like Harpedon, Mackerel, lobster, Pearl oyster.
		CO 4. Study of fishery byproducts and different fish preservation techniques.
		CO 5. Study the Introduction to Pests and Various types of Pests.
		CO 6. Study the Insect pests of Agricultural Importance. (Marks of Identification, Life cycle, Nature of damage, and Control measures.)
		CO 7. Study of Non-insect Pests.
		CO 8. Study of the pest control practices in brief.
		CO 9. Study of the plant protection appliances.
		CO 10. Study of pesticides.
Semester-II		
	(ZY 221) Animal Systematics and	CO 1. Study of invertebrate phyla like Arthropoda, Mollusca & Echinodermata
	Diversity V (Paper-I)	CO 2. Study of Arthropoda, Mollusca Echinodermata with reference to their specific characteristics like mimicry,

		larval forms, shell and foot modification and pedicellariae.
		CO 3. Detailed study of morphology and physiology of various system of <i>Asterius</i> .
	(ZY 222) Applied Zoology II	CO 1 Study the concept of Apiculture and nesting behavior of <i>A. dorsata</i> , <i>A. florae</i> , <i>A. indica</i> and <i>A. mellifera</i> .
	(Apiculture & Sericulture)	CO 2. Study of bee keeping equipment.
		CO 3. Study of bee keeping and seasonal management.
		CO 4. Study of different types of bee products.
		CO 5. Study of bee diseases and enemies.

		CO 6. Study the concept of Sericulture and different types of silkworm like Mulberry, Tassar, Eri and Muga silkworms in India.
		CO 7. Study of morphology and life cycle of <i>Bombyxmori</i> .
		CO 8. Study of cultivation and harvesting of mulberry plant.
		CO 9. Study of silkworm rearing and postharvest processing
T.Y.B.Sc.		
Semester III	(ZY 331) Animal Systematics and Diversity V (Paper I)	CO 1. Study of the morphology and physiology of <i>Pilaglobosa</i> and <i>Calotesversicolor</i> .
		CO 2. Description, locomotion and nutrition of Phylum – Protozoa.
		CO 3. Description of the phylum Coelenterata and its polymorphism
		CO 4. Description of Canal System of phylum- Porifera.
		CO 5. Description of Phylum Nematoda and give examples of pathogenic Nematodes
		CO 6. Identification and study of the characters of class - Dipnoi with its example.
		CO 7. Comparative studies of Heart, Kidney, Brain and Arterial System in different vertebrates.
		CO 8. Study of the Dentition in mammals.
		CO 9. Description of the Accessory Respiratory organs in fishes.
	(ZY 332) Mammalian Histology (Paper-II)	CO 1. Study of the epithelial, connective, nervous and muscular tissue.
		CO 2. Histological studies of the organs like- skin, tooth, tongue, alimentary canal and digestive gland, respiratory organs, blood vessels, kidney and reproductive organs.
		CO 3. Detail study of endocrine gland like pituitary, thyroid and adrenal gland.
	(ZY 333) Biological Chemistry Paper III	CO 1. Study of chemical process within living organism.
		CO 2. Study the Types of bonds and their functions in biomolecules.
		CO 2. Study the Structure of Water molecule and their Physical and Chemical Properties.
		CO 4. Study the concept of Acid and Base, pH, Sorenson's scale, derivation of Henderson-Hassel Balch equation and its application.
		CO 5. Study the concept of Buffer, Types, Buffering capacity, and buffers in biological system.
		CO 6. Much of biochemistry deals with the structures, functions and interactions of biological macromolecules.
		CO 7. Study the Carbohydrates with classification and Significance.
		CO 8. Study the Proteins with Structures and Classifications of Amino acids.
		CO 8. Study the Enzymes their Classification and Regulation.
		CO 9. Study the Lipids and their Classification and Significance.
	(ZY 334) Environmental Biology	CO1 Understanding of Basic concepts of Environmental science & its Scope.

	&Toxicology (Paper IV)	CO 2. Study of Biotic & Abiotic factors.
		CO 3. Study of types of Ecosystem, Food web/chain & Ecological Pyramid.
		CO 4. Understanding of Different Types of Environmental pollution.
		CO 5. Study of Effects of pollution on Environment & Ecosystem.
		CO 6. Study of Bio-indicators & Environmental monitoring.
		CO 7. Understanding the Environmental challenges in India.
		CO 8. Study of Toxicants & their effect.

	(ZY 335) Parasitology (Paper V)	CO 1. Study of types of parasite like endo parasites and ectoparasites.
		CO 2. Study of types of hosts like intermediate, definitive paratenic and reservoir.
		CO 3. Study of host parasite relationship.
		CO 4. Detailed study of endoparasite of <i>Plasmodium vivax</i> , <i>Entamoebahistolytica</i> , <i>Ascariuslumbricoides</i> and <i>Taeniasolium</i> .
		CO 5. Detailed study of the ectoparasite of Head louse, Tick, Mite.
		CO 6. Study of parasitological significance of Zoonosis.
		CO 7. Study of epidemic diseases.
	(ZY 336) Cell Biology (Paper VI)	CO1. Study of the concepts of cell Biology.
		CO 2. Study of the scope of Cell Biology.
		CO 3. Study of cell structure and cell functions.
		CO 4. Study of broad description of bio-chemistry of cell, structure & functions of cell organelles.
		CO 5. Study of cell biology with its concern aspects scientifically.
		CO 6. Study of the cellular activities.
		CO 7. Study of significance of cell & its molecular activities.
		CO 8. Study of cancer cell & cancer causing agents.
Semester IV		
	(ZY 341) Biological Techniques (Paper I)	CO 1. Study of preparation of different solutions/ strength of chemicals in percentage, normality, ppm, ppb etc.
		CO2. Study of separation techniques like chromatography, electrophoresis, ultracentrifugation, colorimetry and spectroscopy.
		CO3. Study of haematological techniques like Blood cell count, Microscopy, Micrometry and Camera lucida.
		CO 4. Study of micro technique procedure like procurement of tissues, fixatives, method of fixation and dehydration.
		CO 5. Detailed study of microtome: types & knives.
		CO 6. Study of different types of stain and staining procedure.
	(ZY 342) Mammalian Physiology and Endocrinology (Paper II)	CO 1. Study of concept of nutrition and study of physiology of digestion related to digestive enzymes.
		CO 2. Study of circulation in relation to cardiac cycle, blood pressure and advanced techniques like electrocardiogram, angiography and coronary bypass.
		CO 3. Study of types of respiration pulmonary and tissue, transport of oxygen and carbon dioxide, RQ and BMR.
		CO 4. Study of excretion, its physiology, role of ADH and significance of renal failure and dialysis.
		CO 5. Study of striated muscles, theory of muscle contraction and response of muscles to various stimulations.
		CO 6. Study of conduction of nerve impulse, transmission and impulse stimulation, EEG, epilepsy.
		CO 7. Study of reproductive cycles with hormonal control related to pregnancy, parturition and lactation and male reproduction.

		CO 8. Study of hormone action and endocrine disorders like- gigantism, dwarfism, goitar, Myxodema etc.
	(ZY 343) Genetics & Molecular	CO 1. Study of Genetics & its study at molecular level.
	Biology (Paper III)	CO 2. Study of the fundamentals of Genetics.
		CO 3. Study the interrelationship between Genetics & Molecular Biology.
		CO 4. Study of awareness about Heredity & Inheritance of traits/ disease.

		CO 5. Study of applications & techniques of the Molecular Biology.
		CO 6. Study of the Molecular processes & activities of Genetic material.
	(ZY 344) Organic Evolution (Paper IV)	CO 1. Study of Origin Of Life.
		CO 2. Study of Evidences of Organic evolution.
		CO 3. Study of Theories of Organic evolution.
		CO 4. Study the Isolating Mechanism of species.
		CO 5. Understanding of the mechanism of speciation & their types.
		CO 6. Study the Geological Time Scale.
		CO 7. Study the Animal distribution according to the geographical area.
		CO 8. Study of Evolution of Man.
		CO 9. Study of Zoogeographical realms.
	(ZY 345) General Embryology (Paper V)	CO 1. Study the Scope and Theories of general embryology.
		CO 2. Study the Concepts of Developmental Biology.
		CO 3. Study the Gametogenesis in brief.
		CO 4. Study the Fertilization in brief.
		CO 5. Study the Concepts of Cleavage, Gastrulation, and Blastula in brief.
		CO 6. Study the Chick Embryology in brief.
	(ZY 346) Medical Entomology (Paper (Paper VI)	CO 1. Study of fundamentals of entomology.
		CO 2. Study of veterinary entomology.
		CO 3. Study of social insects such as wasp and termites and significance of social organization.
		CO 4. Study of household insect related to human such as cockroach, silverfish, ants and bottles.
		CO 5. Study of some insects as agent causing human diseases such as mosquito, housefly, bedbug, flea, tick, mite etc.
M. Sc. I		
(Zoology)	(ZY 101) Biochemistry I	CO 1. Study of chemical process within living organism.
Semester-I		CO 2. Study the Types of bonds and their functions in biomolecules, study the Structure of Water molecule and their Physical and Chemical Properties.
		CO 4. Study the concept of Acid and Base, pH, Sorenson's scale, derivation of Henderson-Hassel Balch equation and its application.
		CO 5. Study the concept of Buffer, Types, Buffering capacity, and buffers in biological system.
		CO 6. Much of biochemistry deals with the structures, functions and interactions of

		biological macromolecules.
		CO 7. Study the Carbohydrates with classification and Significance.
		CO 8. Study the Proteins with Structures and Classifications of Amino acids.
		CO 8. Study the Enzymes their Classification and Regulation.
		CO 9. Study the Lipids and their Classification and Significance.
	(ZY 102) Cell Biology	CO1. Study of the concepts of cell Biology.

		CO 2. Study of the scope of Cell Biology.
		CO 3. Study of cell structure and cell functions.
		CO 4. Study of overview of chemical nature of cell.
		CO 5. Study of cell biology with its concern aspects scientifically.
		CO 6. Study of the cellular activities.
		CO 7. Study of significance of cell & its molecular activities.
		CO 8 Detail study of cell cycle with their regulation.
		CO 9 Study of Cytoskeleton.
	(ZY 103) Genetics	CO1. Study of fundamentals of Genetics, Mendalian ratios & modified Mendalian ratios.
		CO2. Study of classical consent of gene.
		CO3. Study of linkage and crossing over.
		CO4. Study of inheritance of qualitative and quantitative traits.
		CO 5 Detail Study of population genetics.
	(ZY 105) Skills in Scientific	CO 1 Study of common error in written and spoken presentation.
	Communication and Writing	CO 2 Study the hypothesis, theory and concept and genetic code as a simple language.
		CO 3 Study of outline of a science paper and project preparation, funding.
		CO 4 Study the writing of Introduction, Materials and Methods, Observations and Results and Discussion.
	(ZY 106) Fresh Water Zoology	CO 1. Study of types of aquatic environment.
		CO 2. Study of physical and chemical properties of water.
		CO 3. Study of Physiological and protective adaptations of protozoa, rotifer, crustaceans, fishes.
		CO 4. Study of Diagnostic features and life cycle of temporary rainwater pool animals: Fairy shrimps and Tadpole shrimps.
		CO 5. Study of Respiratory and Locomotary adaptations in freshwater insects and their larvae.
		CO 6. Study of Amphibia and water.
		CO 7. Study of Adaptations in Freshwater reptiles.
		CO 8. Study of Economic importance of freshwater mollusks.
		CO 9. Study of Biological changes in freshwater due to sewage pollution and its effect on freshwater animals.
Semester II		
	(ZY 201) Biochemistry II	CO 1 Study of basic law of thermodynamics.
		CO 2 Detail study about metabolism and metabolic pathway like glycolysis, TCA etc.
		CO 3 Study oxidative degradation of amino acid, purine and pyrimidine degradation and lipid metabolism.
	(ZY 202) Molecular Biology	CO 1. Study of DNA structure and topology.

		CO 2. Study of Physical properties of DNA.
		CO 3. Study of DNA replication.
		CO 4. Study of DNA damage and repair.
		CO 5. Study of Transcriptional unit in prokaryotes and eukaryotes.
		CO 6. Study of Protein synthesis.
		CO 7. Study of Mobile DNA elements.

	(ZY 203) Developmental Biology	CO 1. Study the Scope and Theories of general embryology and model organism.
		CO 2. Study the Concepts of Developmental Biology.
		CO 3. Study the Gametogenesis in brief including spermatogenesis and oogenesis.
		CO 4. Study the Fertilization in brief.
		CO 5. Study the Concepts of Cleavage, Gastrulation, and Blastula in brief.
		CO 6 Details study of organizers and mesoderm induction in xenopus.
		CO 7 Study the pattern formation in drosophila.
		CO 8 Detail study of growth and post embryonic development.
	(ZY 204) Endocrinology	CO 1. Study of Hormones as chemical messenger and its structure.
		CO 2. Study of Hormone receptors, on plasma membrane, cytoplasm, and nucleus.
		CO 3. Study of Mechanism of hormone action signal transduction cascade.
		CO 4. Study of Hypothalamic hypophysiotropin.
		CO 5. Study of Adenohypophysial hormones.
		CO 6. Study of Control of Chromatophore.
		CO 7. Study of Hormonal regulation of carbohydrates, protein, and lipid metabolism.
		CO 8. Study of Osmoregulatory hormones.
		CO 9. Study of Gastrointestinal hormones.
		CO 10. Study of Control of calcium and phosphate metabolism.
		CO 11. Study of Endocrine regulation of yolk synthesis, secretion, and uptake in oogenesis with respect to amphibians.
		CO 12. Study of Hormones and Reproduction in cephalopod mollusks and echinoderms.
		CO 13. Study of Hormones regulation in insect larval development and metamorphosis.
	(ZY 205) Comparative Animal Physiology	CO 1. Study of concept of nutrition and study of physiology of digestion related to digestive enzymes
		.
		CO 2. Study of circulation in relation to cardiac cycle, blood pressure and advanced techniques like electrocardiogram, angiography and coronary bypass.
		CO 3. Study of types of respiration pulmonary and tissue, transport of oxygen and carbon dioxide, RQ and BMR.
		CO 4. Study of excretion, its physiology, role of ADH and significance of renal failure and dialysis.
		CO 5. Study of striated muscles, theory of muscle contraction and response of muscles to various stimulations.
		CO 6. Study of sense organs in vertebrates.
		CO 7. Study of thermobiological terminology.
		CO 8. Study of chemical communication in vertebrates.
	(ZY 206) Biological Techniques	CO 1. Detail study about chromatography, electrophoresis, absorption spectroscopy,

		Radioactivity, manometry.
		CO 2 Study of methods for protein and DNA sequencing.
		CO 3 Detail study of centrifugation.
M.Sc. II		
Semester III (ZY 301) Animal Physiology I		CO 1 Study of Bioluminescence and animal electricity and concept of buoyancy.
		CO 2 Study of External and Internal Environment in Animal body.

		CO 3 Study of membrane physiology of animal.
		CO 4 Study of energy metabolism in animal.
		CO 5 Study of excretion, osmoregulation.
	(ZY 302) Immunology	CO 1 Detail Study of Immune system of human.
		CO 2 Study of humoral immunity, immediate response to infection in human.
		CO 3 Detail study of antibody structure and theories of antibody synthesis.
		CO 4 Study of antigen – antibody reaction and complement fixation pathway.
		CO 5 Detail study of immunogenetics.
		CO 6 Study of different immunological techniques.
	(ZY 304) Insect Physiology and Biochemistry	CO 1. Study of Integument of insect.
		CO 2. Study of Digestion and absorption of proteins, Carbohydrates and lipids in insect.
		CO 3. Study of Fat body of insect.
		CO 4. Study of ventilatory mechanism and their control in insect.
		CO 5. Study of Haemolymph of insect.
		CO 6. Study of Muscle in insect.
		CO 7. Study of Excretion and water balance in insect.
		CO 8. Study of microsomal and extra microsomal enzymes insecticide degradation and detoxification in .
		insect body
		CO 9. Study of Endocrine, neuroendocrine hormones, chemistry, function and physiology, other peptide and steroid hormones in insect.
	(ZY 305) Research Methodology	CO 1 Study of concept of research methodology.
		CO 2 Study of quantitative methods use in research.
		CO 3 Study of computer application in research work.
		CO 4 Study of different tools and techniques use in research projects.
	(ZY 307) Fundamentals of Systematic	CO 1 Detail study of systematics and living organism classification system.
		CO 2 Study of kingdoms of life.
		CO 3 Study of different methodology in systematic.
		CO 4 Study of taxonomical key, taxonomic procedure and molecular phylogeny.
	(ZY 308) Insect Ecology	CO 1. Detail study of insect ecology.
		CO 2. Study of insect and climate, herbivores insects.
		CO 3. Study of natural enemies of insect and insect population dynamics.
		CO 4. Detail study of insect ecosystem and their conservation.

Semester IV	(ZY 401) Animal Physiology II	
		CO 1 Detail study of concept of nutrition, digestion, respiration in animal.
		CO 2 Study of Blood and blood vessels of animal.
		CO 3 Detail study of cardiac physiology.
		CO 4 Study of neuronal physiology in animal.
		CO 5 Study of Animal muscle physiology.

		CO 6 Study of sensory physiology in animal.
	(ZY 402) Economic Zoology	
		CO 1. Study of Parasitic protozoans and their role in human welfare, soil protozoans and their role in agriculture.
		CO 2. Study of Sponge culture and its importance in industry.
		CO 3. Study of Concept of Coral reefs and its significance.
		CO 4. Study of Helminthes as human and animal parasites.
		CO 5. Study of Nematodes- parasitic roundworms of animals and plants.
		CO 6. Study of Vermiculture industry in India.
		CO 7. Study of house hold insects, Apiculture, Lac culture, Sericulture, Prawn culture, Insects of commercial value and stored grain pests.
		CO 8. Study of Economic importance of amphibian, reptiles, and birds.
		CO 9. Study of Poultry, Piggery, Dairy industry and wool industry.
		CO 10. Study of Model animals in Pharmaceutical industry.
	(ZY 403) Mammalian reproductive physiology	CO 1 Study the Reproductive organ: male and female gonads, duct systems and sex accessories, external sexual dimorphisms.
		CO 2 Study of Sexual cycles: puberty, estrous and menstrual cycles.
		CO 3 Study of Hormonal regulation in Human body.
		CO 4 Study the conception and blastocyst formation, implantation and delayed implantation, placenta: formation, types and functions, hormones in pregnancy.
		CO 5 Study of birth process and its neuroendocrine control and Lactation.
		CO 6 Study of artificial control of reproduction.
	(ZY 404) Histology and Histochemistry	CO 1. Study of the epithelial, connective, nervous and muscular tissue.
		CO 2. Histological studies of the organs like- skin, tooth, tongue, alimentary canal and digestive gland, respiratory organs, blood vessels, kidney and reproductive organs.
		CO 3. Detail study of detection of glycogen, neutral acid, mucopolysaccharides, detection of basic proteins, and detection of specific and nonspecific lipids.
		CO 4. Detail study about tools in histology
	(ZY 406) Apiculture	CO 1 Study the concept of Apiculture and nesting behavior of <i>A. dorsata</i> , <i>A. florae</i> , <i>A. indica</i> and <i>A. mellifera</i> .
		CO 2. Study of bee keeping equipment.

		CO 3. Study of bee keeping and seasonal management.
		CO 4. Study of different types of bee products.
		CO 5. Study of bee diseases and enemies.
	(ZY 407) Pest Control	CO 1. Study of Introduction of the pest control, types of pests and their importance, Damage caused by pests.
		CO 2. Study of Brief outline of medical and veterinary entomology with reference to important measures to control the vectors. House hold and stored grain pest and their control measures.

		CO 3. Study of Principles and methods of pest control.
		CO 4. Study of Autocidal control, Chemosterilents, Knipplings model, Pheromonal and hormonal control and Concept of Integrated pest management.
		CO 5. Study of Non- insect pest and their control: Rat, Bandicoots, Crabs, Snails, Slugs, Birds and Squirrels.
		CO 6. Study of Pesticide- Appliances: Sprayers and Dusters, Hazards of Pesticides and Antidotes.
Department of Microbiology		
F.Y. B.Sc.	Introduction to Microbiology Paper I.	CO 1. The course aids in basic understanding of the genesis of Microbiology with emphasis on various great discoveries, golden era in microbiology, the efforts of great microbiologists.
(Annual)		CO 2. The scope of Microbiology in the different fields with thrust on the applications of microorganisms of ancient and advanced periods.
		CO 3. The characterization of various groups of microorganisms based on morphology and reproduction using Bergey manual for bacteria and viruses by ICTV.
		CO 4. Detailing the cytology of microorganisms with respect to ultra structure to be used in identification.
		CO 5. Analysis of the role of biological chemicals in cell by understanding the types, functions with examples.
	Basic Techniques in Microbiology Paper II	CO 1. Awareness of bio safety, containment, asepsis and their role in microbiology laboratories.
		CO 2. Knowledge of the measurements used in microbiology in terms of micrometry, units, conversions.
		CO 3. Understanding the principles of basic microscopy, use of different types of microscopes, care & maintenance in handling microscopes.
		CO 4. Knowledge of the stains used in study of microorganisms, staining methods, role of different stains and theories of staining.
		CO 5. Learning of the methods of sterilization, disinfection, mechanisms of each agent, testing the disinfectant. efficiency
		CO 6. Assessment of the requirements of growth, nutrients, media ingredients, media preparation, enrichment methods, pure culture isolation methods, identification & special cultivation methods for each group of microorganisms.
		CO 7. Study of the principles of general growth, compare the different types of growth, measurement methods with emphasis on industry.
	Practical course: Paper-III	CO 1. Learning of the general instructions of safety in microbiology, discuss the need of micro-aid box.
		CO 2. Skills for handling instruments of microbiology laboratory with care & maintenance, creation of SOPs.

		CO 3. Skills for handling different types of microscopes and learn the design, functioning and maintenance.
		CO 4. Collection of samples for identification of the microorganisms from natural habitats and characterize morphologically, staining & motility.
		CO 5. Enumeration of the bacteria, fungal cells & their spores by Neubauer chamber method.
		CO 6. Knowledge of aseptic transfer techniques.
		CO 7. Preparation of media for cultivation of microorganisms and perform media sterilization and checking its efficiency,
		to study the growth characters on different media.

		CO 8. Learning of the pure culture isolation methods by streak, spread, pour plate method after serial dilution of the given soil sample.
		CO 9. Enrichment of the soil microorganisms using winogradskys column, enrichment media.
		CO 10. Demonstration of the methods of disinfection and check the effect of disinfectants on skin microflora.
		CO 11. Learning of the method of phenol co-efficient method.
		CO 12. Assessment of the optimization of the growth conditions and to test the effect of each factor at different limits.
S.Y. B.Sc.		
	(MB-211) Microbial Physiology Paper-I	CO 1. Study the principles of bacterial taxonomy, classification, identification based on Bergeys manual.
		CO 2. Learning of the different methods used in taxonomy.
		CO 3. Sketching of the different physiology in different cells with the pathways and the role of enzymes as catalysts with the principles of their action.
	(MB-212) Microbial Genetics	CO 1. Understanding of the screening methods used in fermentation industry, strains used & their characters.
		CO 2. Assessment of the types of cultures, media used, monitoring methods during the fermentation process,
		CO 3. Skills to avoid the Risks of contamination, types of fermentations and applications of microorganisms in industry
		CO 4. Study the different types of soils, formation of soil, role of microbes in soil as rhizosphere, composting, bioinoculants, microbial associations in soil.
		CO 5. Skill to sketch the biogeochemical cycles with role of microorganisms.
		CO 6. Knowledge of the microbial degradations of complex polymers.
		CO 7. Learning of the the methods of large scale production of bioinoculants.
	(MB-221) Bacterial Systematics and Analytical Microbiology Paper-II	CO 1. Knowledge of the basics principles of genetics with focus on discoveries, experiments of scientists.
		CO 2. Development of skills to sketch the structure of nucleic acids with their role in cells.
		CO 3. Ability to compare the structures of different forms of nucleic acids.
		CO 4. Learning the principles of DNA replication, methods, models and sequence of events.
		CO 5. Analysis of the DNA code, gene organization, gene expression.
		CO 6. Understanding of the role of mutations, mutagens, mechanism, types of mutants, isolation methods.
		CO 7. Knowledge of plasmids- types, characters, genetics, curing, role.
	(MB-222) Applied Microbiology I	CO 1. Understanding of the significance of air and water quality.
		CO 2. Learning the the principles of air microbiology, differentiating air droplets, aerosols, nuclei.
		CO 3. Assessing the the different methods of air sampling .
		CO 4. Learning of the methods of air sanitation.

		CO 5. Knowledge of the different types of water, compostion, water standards, water potability.
		CO 6. Analysis of the sampling of water and fecal indicators in Water.
		CO 7. Knowledge of the water treatment methodologies.
		CO 8. Ability to characterize the waste waters and treatment methods for effective disposal of waste waters.
	Practical course:	CO 1. Learning of the air sampling methods by settling velocity and Simpsons diversity
		index and to comment on the air quality
		CO 2. Identification and characterization of pathogens form air, soil and water by cultural,
		morphological and biochemical characterization.

		CO 3. Knowledge of the water sampling methods, potability testing, D.O., BOD, TS, TSS, TDS determination.
		CO 4. Skills to carry out mutagenesis, isolation & characterization of mutants by replica plate method.
		CO 5. Knowledge and study the bacterial growth curve and plotting the graphs using software.
		CO 6. Visit to a fermentation industry/water treatment plant and report generation.
Department of Botany		
F.Y. B. Sc	Fundamentals of Botany: Term-I	
(Annual)		CO1. Emphasis on understanding of different plant groups.
		CO2. Inculcation of the awareness about biodiversity.
		CO3. Understanding of economic implications of Algae, Fungi, Lichens, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms.
		CO4. Provision of phylogenetic i.e. evolutionary line among the plants.
		CO5. Identification of technique for research.
	Term- II: Morphology and Anatomy	CO1. Study of Morphology Introduction, Definition and Scope. Descriptive and Interpretative. Importance in identification, nomenclature, classification, phylogeny and Plant breeding.
		CO2. Understanding of Morphology of Vegetative Parts such as root, stem and leaves
		CO3. Study of Morphology of Reproductive Parts such as inflorescence, flower, fruit and seeds.
		CO4. Understanding of internal organisation of plants, ecological interpretations, pharmacognosy and wood identification.
		CO5. Knowledge of taxonomic base on the basis of anatomical features.
Paper II	Term I – Industrial Botany	CO1. Introduction to industrial applications of Botany.
		CO2. The course provides basic foundation for self employment generation through floriculture techniques, Bio fertilizes, nursery techniques, organic fertilisers, etc.
		CO3. Study of Plant Nursery Industry Concept and types of nurseries: ornamental plant nursery, fruit plant
		CO4. Nursery, medicinal plant nursery, vegetable plant nursery, orchid nursery, forest nursery

		(with reference to infrastructure required, outputs, commercial applications and profitability).
		CO5. Understanding of the general techniques Plant Tissue Culture Industry Concept of tissue culture.
		CO6. Understanding of the Agri industries Organic Farming: Concept, need of organic farming, types of organic fertilizers, advantages and limitations for sustainable agriculture and healthy life.
	Term- II – Industrial Botany	CO1. Focusing on the understanding of eco-friendly novel techniques such as Bio- fuel, Bio-pesticides, Bio-control, Bio-fertilizers.
		CO2. Study of Bio-fuel Industry Introduction and advantages, Concept of bio-fuel and its need.
		CO3. Study of Bio-pesticide Industry Concept of bio-control; Integrated Pest Management (IPM) and Importance of bio pesticides.
		CO4. Enumeration of implication of fungi in industries for the production of products like food, antibiotics, acids, alcohol, SCP, etc.
		CO5. Understanding of the types of bio-fertilizers: Nitrogen fixing bio fertilizer: <i>Rhizobium</i> , Blue green algae. <i>Anabaena</i> associated with <i>Azolla</i> . PSB, Bacteria and Fungi. Commercial significance of bio-fertilisers.
		CO6. Provision of technique for fruit processing (canned fruits, dried fruit chips, fruit pulp, squash, jam, jelly, pickle and ketchups) and to generate self employment in rural areas and improve economic status of farmers.
		Botany Practical (Paper – III)
		CO1. Development of techniques in identification, classification of plants of different groups.
		CO2. Understanding of morphological features of root, stem, leaves, flower, fruits and seeds.
		CO3. Enumerating the internal primary structure of dicotyledonous root, stem and leaf.
		CO4. Study of internal primary structures of monocot and dicots w.r.t. root, stem and leaf.
		CO5. Understanding the life cycle pattern of Study of Spirogyra, Cystopus, Riccia, Nephrolepis and Cycas.
		CO6. Demonstrating the uses of plant resources in industries: food, fodder, fibre, medicine, timber and Gum.
		CO7. Study of artificial plant propagation methods: Stem cutting, Air Layering, Approach grafting, and T- budding.
		CO8. Study of the various plant tissue culture techniques: Demonstration of various stages.
		CO9. Demonstration of the methods of Cultivation of Oyster mushroom and demonstration of value added mushroom products.
		CO10. Study of plant resources used in bio-pesticides such as Indiar, Azadiractin.
		CO11. Assessing the industrially important fungi and their products.
		CO12. Study of types of Biofertilizers: Rhizobium, Azatobacter, BGA, Azolla.
		CO13. Performing the recipe of Jam and Squash preparation.
S.Y.B.Sc		
Semester-I	Taxonomy of Angiosperms and Plant community (BO-211)	CO1. Knowledge regarding Angiosperm Taxonomy.
	Paper I	CO2. Understanding of Systems of classification with their merits and limitations- a) Artificial system- Carl Linnaeus, b) Natural system -Bentham and Hooker, c) Phylogenetic system- Engler and Prantl
		CO3. Awareness of Taxonomic literatures w.r.t. Flora, monograph, revisions, manuals, journals, periodicals

		and references books.
		CO4. Study of Sources of data for Systematics such as Morphology, Anatomy, Cytology, Embryology
		And Phytochemistry
		CO5. Study of Botanical Nomenclature
		CO6. Study of Plant Families with reference to systematic position, salient features, formula, floral diagram and
		any five examples with their economic importance – Annonaceae.
		CO7. Meliaceae, Myrtaceae, Rubiaceae, Solanaceae, Asclepiadaceae, Euphorbiaceae

		CO9. Study of Computer in taxonomy
		CO10. Introduction to ecology includes Definition, Concept, Autecology and Synecology.
		CO11. Knowledge of Ecosystem and its components: biotic and abiotic, Food chain, Food web, Ecological pyramids.
	(BO-212) Plant Physiology Paper II	CO1. Introduction of Plant Physiology.
		CO2. Understanding of the Scope and applications of plant physiology.
		CO3. Learning of the Physico-chemical properties of water.
		CO4. Study of the phenomenon like Diffusion, Osmosis, Plasmolysis, Imbibition.
		CO5. Understanding of Mechanisms of water absorption.
		CO6. Study of the Physical force theories of Ascent of sap.
		CO7. Learning of the Mechanism of opening and closing of stomata.
		CO8. Study of processes like Guttation and Exudation and their significance in plant metabolism.
		CO9. Study of Factors affecting growth.
		CO10. Knowledge of Properties and to understand practical applications of auxins, cytokinins, gibberellins, ethylene and abscisic acid.
		CO11. Learning of types of seed dormancy Methods to break seed dormancy.
		CO12. Study of physiology of flowering with respect to Photoperiodism, Phytohormones, and Vernalisation.
Semester-II	Paper I Plant Anatomy and Embryology (BO-221)	
		CO1. Understanding of plant anatomy and types of tissues.
		CO2. Study of Structure and function of epidermal tissue system.
		CO3. Learning of Types and functions of stomata.
		CO4. Study of epidermal outgrowth: glandular and non-glandular.
		CO5. Study and understanding of Mechanical tissue system and Principles involved in distribution of mechanical tissues.
		CO6. Study of Structure and function of xylem, phloem and cambium.
		CO7. Study of Normal secondary growth and Anomalous secondary growth.
		CO8. Understanding of the scope of plant embryology.
		CO9. Study of process and types of Microsporogenesis and Megasporogenesis.
		CO10. Study of details about Endosperm and embryo
	Paper II Plant Biotechnology (BO-222)	CO1. Understanding of concept, techniques and scope Biotechnology.
		CO2. Learning of properties of enzymes and Classification of enzymes.
		CO3. Learning of method of Production of amylase, proteases and lipase enzyme.
		CO4. Understanding of Fermentation Technology with respect to Bioreactors used and media composition, etc.
		CO5. Study of single cell protein, Introduction and need of proteins in diet.

		CO6. Knowledge regarding the production of SCP from algae (Spirulina) and fungi (Yeast).
		CO7. Understanding of the economic implications of S
	Paper III Practical course	CO1. Development of various techniques in the field of Taxonomy, Anatomy, Physiology, Embryology,
		Ecology and Biotechnology
		CO2. Elaboration of Plant Systematics with description of flowering plants in botanical terms for Plant families like:
		i. Myrtaceae, ii. Rubiaceae, iii. Solanaceae, iv. Asclepidaceae, v. Amaryllidaceae
		CO3. Study of Ecological adaptations in Hydrophytes and Xerophytes.

		CO4. Study of Vegetation by List-count Quadrat method.
		CO5. Study of tools of Taxonomy and Ecological instruments, Spectrophotometer, Centrifuge and pH meter.
		CO6. Determination of WHC and pH of soil
		CO7. Verification of Plasmolysis, DPD, rate of transpiration, Curling Experiment, Imbibition Pressure, Arc Auxanometer with experimental proofs.
		CO8. Testing seed viability by TTC method
		CO9. Study of Plant Anatomy with respect to Epidermal tissue system, mechanical tissues and their distribution in root, stem and leaves, normal secondary growth in dicot stem – Annona , Moringa, anomalous secondary growth in Bignonia and Dracaena stem
		CO10. Study of Plant Embryology with respect to tetrasporangiate anther, types of ovules and dicot and monocot embryo.
		CO11. Estimation of Citric acid in Aspergillus fermentation.
		CO12. Study of the production of single cell protein production i.e. Spirulina, Yeast and study of commercial products
		CO13. Demonstration of fermentation and fermentation products, separation of plasmid DNA by agarose gel electrophoresis and enzyme immobilization
Department of Bachelor of Business Administration (BBA)(Computer Application)		
BBA(CA)		
Semester I	Principles of Programming and Algorithms (101) Paper I	CO 1. Understanding about how to write algorithms and design flowchart for Programming purpose.
	Modern Office Environment & Office Automation (101) Paper II	CO 1. Identification of software's, Hardware devices, Making Excel Sheet, Power point Presentations
	Prin. of Man(102) agement (103) Paper III	CO 1. Developing, Organizing and Management Skill with the help of various theories.
	Financial Accounting (104) Paper IV	CO 1. Developing accounting systems of various organization
	Business Communication Paper V (105)	CO 1. Implementing effective business writing, skills that maximize team effectiveness Understand concept of accounting through Tally.

Semester II		
	Procedure Oriented Programming	CO1. Understanding and Improvement of the programming logic. It is helpful to develop System Software.
	Using ‘C’ Language (201) Paper I	
	Database Management	CO1. Maintenance, proper handling, creation, firing queries to the database with mapping cardinalities , Cartesian product.
	System Paper II (202)	Study models like hierarchy, data and ERD model
	Organizational Behavior (203) Paper III	CO1. Developing behavior at workplace
	Computer Application in Statistics (Paper IV 204)	CO1. Use of statistical concepts in Computers
	E-Commerce Concepts (205) Paper V	CO1. Knowledge of E-commerce about a transaction of buying or selling online. Electronic commerce draws on technologies such as transfer, supply.
	Lab course – II Practical Paper VI (206)	CO1. Improvement in Programming & Development Skills
Semester III		
	Relational Database Management	CO1. Understanding about how to use database as backend in software Development
	System (301) Paper I	
	Data Structure using ‘C’ (302) Paper II	CO1. Developing, Organizing and Storing the data, Data Analysts
	Introduction to Operating	CO1. Knowledge of operating system concepts.
	System (303) Paper III	CO2. Skill to operate the different operating systems.
		CO3. Study of management of all resources in the O.S.
	Business Mathematics (304) Paper IV	CO1. Usage of Mathematical concepts in Computers
	Software Engineering (305) Paper V	CO1. Knowledge of Software tools, methods, types, phases ,quality metrics Designing, Maintaining, Implementing,

		Testing Software Products
	Lab Course-Practical (306) Paper VI	CO1. Developing Desktop Application software's, Logical and Analytical Skills,
Semester IV		
	Object Oriented Programming	CO1. Developing System Software's
	Using C++ (401) Paper I	
	Programming Using Visual	CO1. Understanding about how to use VB as frontend in software Development
	Basic (402) Paper II	
	Computer Networking (403) Paper III	CO1. Awareness about Computer. User understands how to access remote programs and
		remote databases either of the same organization or from other enterprises or public sources.

	Enterprise Resource	CO1. Knowledge of ERP.
	Planning (404) Paper IV	
	Human Resource Management	CO1. Development and implementation of employee training, development programme and understanding process of
	(405) Paper V	Recruitment, selection.
	Lab Course-Practical (406) Paper VI	CO1. Development of Desktop Application software's, Logical and Analytical Problem Solving Skills
Semester V		
	Java Programming (501) Paper I	CO1. Development System Software's
	Web Technology (502) Paper II	CO1. Knowledge of the Programming in JavaScript, VBScript and html syntaxes, methods for web application development
	Dot NET Programming (503) Paper III	CO1. It is helpful to students that how to develop Desktop Application.
	Object Oriented Software	CO1. Designing, Maintaining, Implementing, Testing Software Products
	Engineering (504) Paper IV	
	Lab Course-Project Practical	CO1. Project learning, also known as project-based learning, is a dynamic approach teaching in which students
	(505) Paper V	explore real-world problems and challenges, simultaneously developing cross-curriculum skills while working in small collaborative groups
	Lab Course-Project	CO1. Developing Desktop Application software's, Logical and Analytical Skills, Problem Solving Skills
	Practical (506) Paper VI	
Semester VI	Advanced Web Technology (601) Paper I	CO1. Developing Web Applications
	Advanced Java (602) Paper II	CO1. Design & Developing Web Application software.
	Recent Trends in IT (603) Paper III	CO1. Understanding of current trends in Software industries and Corporate sectors.
	Software Testing (604) Paper IV	CO1. Testing of a developed Software.

	Lab Course-Project Practical	CO1. Project learning, also known as project-based learning, is a dynamic approach to teaching in which
	(605) Paper V	students explore real-world problems and challenges, simultaneously developing cross-curriculum skills
		while working in small collaborative groups.
	Lab Course-Project Practical	CO1. Developing the Desktop Application software's, Logical and Analytical Skills, Problem Solving Skills.
	(606) Paper VI	