2.6.1 Program outcomes, Program Specific outcomes, for all program offered by the institute are started and displayed on website and communicated to the teachers & students

Program Outcomes

Program outcomes of Bachelor of Arts

PO1. Demonstrate a detailed knowledge and understanding of selected fields of study in core disciplines in humanities, social sciences and languages.

PO2. Articulate the relationship between diverse forms of knowledge and the social, historical and cultural contents that produced them.3) Communicate effectively and in the case of those students undertaking a language major, need, write, listen to and speak another language with fluency and appreciate its cultural context.

PO3. Reading, Writing skills and Process:- Students will become accomplished, active readers to appreciate ambiguity and complexity and who can articulate their own interpretations with an awareness and curiosity for other perspectives. Students will be able to write effectively for a variety of professional and social setting. they will develop an awareness and confidence in their own voice as a writer and analyze complex social and natural problems with the help of their degree specialization.

PO4. Sense of Genre:- Student will develop an appreciation of how the formal elements of language and genre shape meaning and they will develop a facility at writing in appropriate genres for research and other variety of purposes.

PO5. Critical Approaches:- Students will develop the ability to read works of literary, rhetorical, research, cultural criticism and develop idea with the help of their specialization. They will express their own ideas as informed opinions, small projects, practical, research papers and understand how their own approach compares to variety of critical and theoretical approaches.

PO6. Oral communication skills:- Student will demonstrate the skill needed to participate in conversation that builds knowledge collaboratively. Listening carefully and respectfully to others view points. Articulating their own ideas and questions clearly and situating their own ideas in relation to other voices and ideas. Student will be able to prepare, organize and deliver and engaging oral presentation.

PO7. Ethics:- Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Program outcomes of Bachelor of Commerce

PO1. Demonstrate knowledge of major theories and models in key areas of organizational

behavior.

PO2. Analysis Organizational problems and generate realistic solutions based on current academic research in organizational behavior.

PO3. Apply basic mathematical and statistical skills necessary for analysis of a range of problems in economics actuarial studies, Accounting, Marketing, Management and Finance.

PO4.**Environment Awareness :** Understand the issues and problems of environmental context and develop environmental awareness in the mind.

PO5.**Consumer Movement :** Make people aware about consumer movement, rights & duties, laws relating to consumers.

PO6.**Sound knowledge of various laws :** Impart the knowledge of basic concepts, terms & provisions of company law, Mercantile law, Income Tax and other laws affecting business, trade and commerce.

Program outcomes of Bachelor of Science

PO1. Articulate the methods of and science and explain why current scientific knowledge is both contestable testable by future inquiry.

PO2. Apply appropriate methods of research, investigation and design, to solve problem in science, mathematics, technology including the planning and conduct of a significant project problem or investigation.

PO3. Articulate the relationship between different science communities of practice, the international scope of science, mathematics, technology and engineering knowledge and methods and the contributions to their development that have been made by people with diverse perspectives, culture and backgrounds.

PO4. Students will develop the ability to read works of literary, rhetorical, research, cultural criticism and develop idea with the help of their specialization. They will express their own ideas as informed opinions, small projects, practical, research papers and understand how their own approach compares to variety of critical and theoretical approaches.

Program Specific Outcomes:

POS are to be listed for all graduates program separately i.e.

Program Specific Outcomes for Marathi

अभ्यासक्रमाची उदीष्टे:

१. कथा या साहित्यप्रकाराची ओळख करून देणे.

२. कथा या साहित्यप्रकाराचे स्वरूप, घटक प्रकार याांची ओळख करून देणे.

३. हिहिध साहित्यप्रवाहातील कथा या साहित्यप्रकारातील निवडक कथाांचे अध्ययन करणे.

४. भाषिक कौशल्यविकास करणे.

Program Specific Outcomes for English

PSO 1. Teaching of the basic concepts of English language and literature.

PSO 2. Learning of Characteristics of literature in English, diverse literary historical periods and cultures PSO 3. Application of literary critical perspectives to generate original analysis of literature in English PSO 4. Promotion of cultural values through English language

Program Specific Outcomes for Geography

PSO1. Understand the nature and basic concept of geography

PSO2. Understand the applied and professional nature of geography such as fields of G.I.S. and surveying

PSO3. Understand the application of modern geography techniques such as geographical information system in society as well as environmental and settlement geography, hazards, language land cover etc.

Program Specific Outcomes for Polities

PSO1. Understand social stratification of castes and jatis, from language, religion, ethic and economic determinants and critically assesses its impact on the political processes

PSO2. To understand the core doctrines of each of the ideologies and to make sense of politics through different ideological perspectives.

PSO3. Understand legacy of the thinkers is explained with the view to establish the continuity and change within the Western political tradition.

Program Specific Outcomes for Economics

PSO 1. Understand the difference between Micro Economics & Macro Economics

PSO2. Understand techniques & diagrams related to employment theory

PSO3. Understand the concept of Foreign Exchange, International Banking & Euro Currency Market

PSO4. To study the international policies

Program Specific Outcomes for Commerce

PSO1. Understand application of mathematical & Statistical concepts and techniques in solving business problems.

PSO2. Develop the insights regarding organizational skills, functioning of modern appliances, e format records in modern office.

PSO3. Stimulate the student's interest by showing the relevance and use of various economic theories.

PSO4. Develop the capability of students for knowing banking concepts and operations.

PSO5. Analyze the basic concept in marketing and prepare to face the relevant changes in the field of marketing .

PSO6. Know the basic concepts, terms and provisions of mercantile & business laws.

PSO7. Instill the knowledge about accounting procedures, methods & techniques.

PSO8. Develop business communication skills.

PSO9. Develop cost consciousness and analytical bent of mind.

Program Specific Outcomes for Physics

PSO1.To understands the basic concept of mechanics, electrodynamics, quantum mechanics.

PSO2. To understand the concepts of energy, work, power, the concepts of conservation of energy, elasticity, surface tension and viscosity.

PSO3. To understand optical phenomena such as polarization, birefringence, interference and diffraction in terms of the wave model and to analyze simple examples of interference and diffraction phenomena.

Program Specific Outcomes for Chemistry

PSO1. Physical chemistry: Review of conventional processes, recent advance techniques. surface properties, ionic properties and other special characteristics of substances,

PSO2. Inorganic chemistry: Introduction to molecular symmetry, co-ordination of compounds and Bio-inorganic chemistry.

PSO3. Organic chemistry: Introduction to fundamental concepts and principles of process synthesis. Proficiency in Synthetic skill, Characterization by various analytical techniques, Micro- techniques and in-depth knowledge in subject is evaluated by allotting synthetic scheme.

Program Specific Outcomes for Botany

PSO1. To understand the physiological process in plants

PSO2. To Study biotechnological process, use of various plants resources at commercial level.

PSO3. To study the variation of plants life at all levels of biological organization.

Program Specific Outcomes for Microbiology

PSO1. Acquiring the basic concepts of Taxonomy, Biostatistics, Bioinformatics, Biochemistry, Biophysics, Waste water engineering and Virology.
PSO2. Finding the suitability of microorganisms and interlinking its role in industry.
PSO3. Exploring microorganisms in the treatment of waste.
PSO4. Studying the instrumentation involved in isolation, identification of microorganisms, biochemistry and molecular biology.

Program Specific Outcomes for Mathematics

PSO1. To develop problem solving skill, mathematical modeling abilities, rational thinking.
PSO2. To inculcate ability to use logical way formulate theories
PSO3. To make them ready in the world of computing and artificial intelligence.
PSO4. To equip them with various tools such as mathematical software, computational techniques etc.
PSO5. To motivate them for applying developed theory for continuing further study in various fields of science.
PSO6. To opt for higher education

Course Outcomes

Course Outcomes of Marathi Dept

Sr.no.	Subject Code	Paper	Program Outcomes
1	[CC-1 A] F.Y.B.A. (प्रथम वर्ष कला) पहिले सत्र	मराठी सावहत्य : कथा आवण भावषक कौशल्यविकास [CC-1 A]	१. कथा या साहित्यप्रकाराची ओळख करून देणे. २. कथा या साहित्यप्रकाराचे स्ूरूप, घटक आहण प्रकार याांची ओळख करून देणे. ३. हिहिध साहित्यप्रिाि ाा मधील कथा या साहित्यप्रकारातील हनिडक कथाांचेअध्ययन करणे. ४. भाहिक कौशल्यहिकास करण

2	[CC-1 A] F.Y.B.A. (प्रथम वर्ष कला) दुसरे सत्र	मराठी सावहत्य : एकाांवकका आवण भावषक कौशल्यविकास [CC-1 A]	१. एकाांहकका या साहित्यप्रकाराची ओळख करून देणे. २. एकाांहकका या साहित्यप्रकाराचे स्िरूप, घटक आहण प्रकार याांची ओळख करून दणे .े ३. मराठी साहित्यातील हनिडक एकाांहककाचे अध्ययन करणे. ाें ४. भाहिक कौशल्यहिकास करण
3	F.Y.B.A. (प्रथम िषर कला) हनिड आधाररत श्रेयाांक पद्धत (Choice Based Credit System) पवहले सत्र पयारयी अभ्यासक्रम	व्याि्हाररक ि उपयोवजत मराठी भाग १ [CC-1 A]	१. सज्ञां ापनातील भाि्ेची भहूमका, हिहिध भाहिक आहिष्ट्काराांचे स्िरूप समिाि्नू घेणे. भाहिक कौशल्याांची क्षमता हिकहसत करणे. २. भाहिक कौशल्याचां ेहिहिध आहिष्ट्कार आहण सपां कवमाध्यमेयाांचा परस्परसबां ाांध समिाि्नू घेणेि उपयोि्न करणे. ३. मराठीचा कायावलयीन, व्याि्साहयक कामकाि्ात भाि्ेचे उपयोि्न, गरि ि स्िरूप या हिशिाांची माहिती करून घेणे. ४. कायावलयीन, व्याि्साहयक भाि्ाव्यि्ाारासाठी आिश्यक लेखनकौशल्याचेसपां ादन ि उपयोि्न करणे.

Course Outcomes of English Dept

S.N.	Class	Subject	Learning Outcomes
1	**F. Y. B. A. Course Code:- 11011**	**Compulsory English** Semester -I	CO1- To sensitize students about the literay and artistic relevance CO2- To instill cross cutting issues among students as responsible citizens of the world CO3- To develop the ability to appreciate ideas and think critically CO4 To develop linguistic competence and communicative skills
2	**F. Y. B. A. Course Code:- 11012**	Semester –II	CO1- To aware students about the literary and artistic relevance CO2 - To instill cross cutting issues among students as responsible citizens of the world CO3 - To develop the ability to appreciate ideas and think critically CO4 - To develop linguistic competence and communicative skills

	F.Y. B.A.: Optional English General Paper I Course Code:- 11331	**Sem I**	CO1 To develop communicative abilities among the students CO2 To make students aware of the cultural values and the major problems in the world today CO3 To sensitize the students about social, environmental and ethical values CO4 To develop overall linguistic competence
4	**F.Y. B.A.: Optional English General PaperI Course Code:- 11332**	**Sem II**	CO1 To expose students to the basics of literature and language CO2 To prepare students to go for detailed study and understanding of literature and language CO3 To introduce the basic units of language so that they become aware of the technical aspects and their practical usage CO4 To develop students' interest in reading literary pieces

5	**S. Y. B. A** **Course Code:- 22011**	**Compulsory English Sem III**	CO1 To sensitize students about the literary and artistic relevance CO2 To instill universal human values through best pieces of literature in English CO3 To develop the ability to appreciate ideas and think critically CO4 To revise and reinforce the learning of some important areas of grammar for better linguistic competence
6	**S. Y. B. A Course Code:- 22012**	**Compulsory English Sem IV**	CO1 To sensitize students about the literary and artistic relevance CO2 To instill universal human values through best pieces of literature in English CO3 To develop the ability to appreciate ideas and think critically CO4 To revise and reinforce the learning of some important areas of grammar for better linguistic competence
7	**Course Code:- 22331**	**SYBA .: Skill Enhancement Course-SEC-1A_ Sem III**	CO1 To sensitize students about the literary and artistic relevance CO2 To instill universal human values through best pieces of literature in English CO3 To develop the ability to appreciate ideas and think critically CO4 To revise and reinforce the learning of some important areas of grammar for better linguistic

			competence
8	**Course Code:- 22332**	**SYBA .: Skill Enhancement Course- SEC-1A_ Sem IV**	CO1 To sensitize students about the literary and artistic relevance CO2 To instill universal human values through best pieces of literature in English CO3 To develop the ability to appreciate ideas and think critically CO4 To revise and reinforce the learning of some important areas of grammar for better linguistic competence
9	**S. Y. B. A**	**SYBA .: Discipline Specific Course (DSC-1A) Appreciating Drama Sem IV**	CO1 To introduce Drama as a major form of literature CO2 To acquaint and enlighten students regarding the literary and the performing CO3 dimensions of drama CO4 To acquaint and familiarize the students with the elements and the types of Drama
10	**S. Y. B. A**	**SYBA .: Discipline Specific Course (DSC-2A) Appreciating Poetry Sem III**	CO1 To acquaint students with the terminology in poetry criticism CO2 To encourage students to make a detailed study of a few sample masterpieces of English poetry CO3 To enhance students awareness in the aesthetics of poetry and to empower them to read, appreciate and critically evaluate poetry independently

11	**S. Y. B. A**	**SYBA .: Discipline Specific Course (DSC-2A) Appreciating Poetry Sem IV**	CO1 To acquaint students with the terminology in poetry criticism CO2 To encourage students to make a detailed study of a few sample masterpieces of English poetry CO3 To enhance students awareness in the aesthetics of poetry and to empower them to read, appreciate and critically evaluate poetry independently
12	**S. Y. B. A**	**SYBA .: Skill Enhancement Course-SEC-2A_ Sem III**	CO1 Enhancing the skill of using English for everyday communication CO2 To acquaint the students with the verbal and nonverbal communication CO3 To create opportunities to access exposure of speaking in various contexts CO4 To acquaint and familiarize the students with soft skills

13	**S. Y. B. A**	**SYBA .: Skill Enhancement Course-SEC-2A_ Sem IV**	CO1 Enhancing the skill of using English for everyday communication CO2 To acquaint the students with the verbal and nonverbal communication CO3 To create opportunities to access exposure of speaking in various contexts CO4 To acquaint and familiarize the students with soft skills
14	**T. Y. B. A. Subject Code:3337**	**TYBA- General English (G-3): Advanced Study of English Language and Literature**	CO1 To introduce students to some advanced areas of language study CO2 To expose students to some of the best samples of Indian English Poetry CO3 To make them understand creative uses of language in Indian English Poetry
15	**T. Y. B. A. Subject Code:3338**	**TYBA Special English III Title of the Paper: Appreciating Novel**	CO1 To introduce students to some advanced areas of language study CO2 To expose students to some of the best samples of Indian English Poetry CO3 To make them understand creative uses of language in Indian English Poetry
16	**T. Y. B. A. Subject Code:3339**	**TYBA- S4- Introduction to Literary Criticism**	CO1 To introduce students to some advanced areas of language study CO2 To expose students to some of the best samples of Indian English Poetry

			CO3 To make them understand creative uses of language in Indian English Poetry

Course Outcomes of Geography Dept

Course Code:-Gg-110-	**FYBA: General paper 1 Physical Geography y (G-1) SEMESTERN I**
CO1	Describe what Geography and Physical Geography are
CO2	Understand the physical principles and processes governing the circulation and characteristics of the atmosphere and climates on Earth.
CO3	Understand the physical principles and processes governing the circulation and characteristics of water on Earth.
CO4	Understand the principles of geomorphology and the processes that shape the landscape.
CO4	Understand the distribution and dynamics of organisms and their environments
CO5	Understand the directional and locational systems employed on the surface of the Earth
CO6	Be able to use and analyze maps
CO7	Understand the basic elements of culture
Course Code:-Gg-110-	**FYBA /:- GENERAL PAPER 2 HUMAN GEOGRAPHY (G1) Semester II**
CO1	Describe what geography and human geography are.
CO2	Understand population dynamics and migration.
CO3	Understand political systems, states, territory, and borders.
CO4	Understand the basic elements of culture
CO4	Understand the types and levels of economic activities

CO5	Understand urban structure and development
Course Code:-	**Fybcom: Commercial Geography SEMESTER I**
CO1	To understand the scope and content of commercial geography in relation to spatial distribution of agriculture, forest resources and industrial production
CO2	To acquaint the students about dynamic aspects of commercial geography
CO3	To acquaint the students about dynamic nature and industrial field
CO4	To make the students of commerce aware about the relationship between the geographical factors and economic activities
Course Code:-	**FYBCom: Commercial Geography SEMESTER II**
CO1	Introduce the students to the geographical mode of thinking in application to various economic phenomena
CO2	Familiarize the students with the principal concepts of economic policymaking and provide a basic conceptual toolkit for their future studies and research in the broader economic domain
CO3	To understand the scope and content of commercial geography in relation to spatial distribution of agriculture, forest resources and industrial production
CO4	To acquaint the students about dynamic aspects of commercial geography
CO5	To acquaint the students about dynamic nature and industrial field
CO6	To make the students of commerce aware about the relationship between the geographical factors and economic activities
Course Code:- Gg-210 B	**S.Y. B.A.: Environmental Geography Semester III**
CO1	After completing the major in **Environmental Studies**, students will be able to: Understand and evaluate the global scale of **environmental** problems
CO2	Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.
CO3	Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions
CO4	Understand how interactions between organisms and their environments drive the dynamics of individuals, populations, communities, and ecosystems
CO4	Recognize the ecological basis for regional and global environmental issues
CO5	Understand the processes and patterns of evolution, and the role of evolution as the central unifying concept in environmental science

CO6	Understand the historical and social context of environmental science thought and research, and the contributions of environmental science to the resolution of ethical, social, and environmental issues in human affairs
Course Code:- Gg-220 B	**S.Y. B.A.: Environmental Geography Semester IV**
CO1	Design and evaluate strategies, technologies, and methods for assessment and sustainable management of environmental systems and for the remediation or restoration of degraded environments
CO2	Students will be able to assess/weigh ethical considerations as a component of environmental decision-making and problem-solving
CO3	To sensitize students towards environmental concerns, issues, and impacts of climate change and related mitigation strategies
CO4	To create awareness about dynamic environment among the students.
CO4	To acquaint students with the fundamental concepts of Environment Geography
CO5	To acquaint students about the past, presents and future utility and potentials of natural resources
CO6	To make aware students about the problems of environment, its utilization and conservation in the view of sustainable development.
Course Code:-Gg-310	**TYBA .: Regional Geography of India (G3)**
CO1	To understand the physical characteristics of India
CO2	To understand the cultural characteristics of India
CO3	To sensitize the students with development issues and policies and programmes designed for regional development

Course Outcomes of Political Science Dept

Class	Paper Code	Paper Name	Learning Outcome

FYBA	1167	Semester –I Unit:1 Making of the U.S. Constitution12 a) Historical Background b) Preamble c) Salient Features Unit: 2 Federal System a) Features b) State Autonomy c) Relations between the Federal Government and the States Unit: 3 Fundamental Rights a) Nature of Fundamental Rights b) Development of Fundamental Rights Constitutional Amendments a) Constitutiona l Provisions b) Important Amendments	• This paper focuses in detail on the political processes and the actual functioning of the political system. • It simultaneously studies in detail the political structure both Constitutional and Administrative. • It emphasizes on local influences that derive from social stratification of castes and jatis, from language, religion, ethic and economic determinants and critically assesses its impact on the political processes. • The major contradictions of the Indian Political Process are to be critically analyzed along with an assessment of its relative success and failure in a comparative perspective with other developing countries and in particular those belonging to the South Asian region.

		(15& 22) Semester –II Unit: 5 Legislature1 a) Structure b) Powers c)Role Unit: 6 Executive a) President: Powers and Functions b) Vice President: Powers and Function c) Secretary: Powers and Functions Unit: 7 Judiciary a) Structure i) Federal Court ii) State Court c) Powers and Functions c) Judicial Review Unit: 8 Federal Election Commission a) Structure b) Functions	

SYBA	2167	(GENERAL PAPER-2) POLITICAL THEORY & CONCEPTS	• This is an introductory paper to the concepts, ideas and theories in political theory. • It seeks to explain the evolution and usage of these concepts, ideas and theories with reference to individual thinkers both historically and analytically. • The different ideological standpoints with regard to various concepts and theories are to be critically explained with the purpose of highlighting the differences in their perspectives and in order to understand their continuity and change. • Furthermore there is a need to emphasize the continuing relevance of these concepts today and explain how an idea and theory of yesteryears gains prominence in contemporary political theory.
	2168	(SPECIAL PAPER- I)	• This paper studies the classical tradition in political
		WESTERN POLITICAL THOUGHT	theory from Plato to Marx with the view to understand how the great Masters explained and analyzed political events and problems of their time and prescribed solutions. • The texts are to be interpreted both in the historical and philosophical perspectives to understand the universality of the enterprise of political theorizing. • The limitations of the classical tradition, namely its neglect of women's concerns and issues and the non-European world are critically examined. • The legacy of the thinkers is explained with the view to establish the continuity and change within the Western political tradition.
	2169	(SPECIAL PAPER- II) POLITICAL SOCIOLOGY	• This Course will introduce the overall scope of the sub-discipline of political sociology. The focus of the course will be on the political sociology of power. • The emphasis is on the nature of power in modern societies—more in the form of organizations and social formations than as individual power. • Students are also expected to understand different forms of justifications of power and the role of ideology in this regard. • State will be studied as a repository of power in society while class and patriarchy are two instances of how the nature of power is shaped by social factors.

TYBA	3167	(General Paper -3) POLITICAL IDEALOGIES	• This paper studies the role of different political ideologies and their impact in politics. • Each ideology is critically studied in its historical context. In course of its evolution and development, the different streams and subtle nuances within each ideology, the changes and continuities in its doctrine and its relevance to contemporary times are highlighted. • The close link between an idea and its actual realization in public policy needs to be explained as well. The philosophical basis of the ideologies is emphasized with special emphasis on key thinkers and their theoretical formulations. The legacy of all the major ideologies is to be critically assessed.
	3168	PUBLIC ADMINISTRAION	• This paper is an introductory course in Public Administration. • The essence of Public Administration lies in its effectiveness in translating the governing philosophy into
		(Special Paper -3)	programme , policies and activities and making it a part of community living. • The paper covers personnel public administration in its historical context thereby proceeding to highlight several of its categories, which have developed administrative salience and capabilities to deal with the process of change. • The recent developments and particularly the emergence of New Public Administrations are incorporated withinthe larger paradigm of democratic legitimacy. • The importance of legislative and judicial control over administration is also highlighted

	3169	INTERNATION AL POLITICS (Special Paper - 4)	• This paper deals with concepts and dimensions of international relations and makes an analysis of different theories highlighting the major debates and differences within the different theoretical paradigms. • The dominant theories of power and the question of equity and justice, the different aspects of balance of power leading to the present situation of a unipolar world are included. • It highlights various aspects of conflict and conflict resolution, collective security and in the specificity of the long period of the post Second World War phase of the Cold War, of Détente and Deterrence leading to theoriesof rough parity in armaments.
Class	Paper Code	Paper Name	Learning Outcome

Couse Outcome of History Dept.

Subject Code SEM-I -11171	**F.Y.B.A.-** Semester-I Early India: From Prehistory to the Age of the Mauryas **(Core Course-CC) SEM-I**
CO1	To understand the Process of History Writing. To get acquainted with referring skills and collecting sources for history writings. To understand importance of different types of language skills required for history writings
CO2	This component instills the knowledge of geography and climates which influences the course of history. It also helps to understand the pattern of urbanization. It provides proper understanding of factors and process which are responsible for rise of civilization and culture.
CO3	To provide proper understanding of main tenets of different Indian religion. It helps in understanding the importance of religion and also how religion influences the life of common people.
CO4	To understand comprehensive knowledge of ancient Indian polity. To understand the growth and progress of Indian society and all India empire. It attempts to highlight the consequences of the foreign invasions, particularly on the polity, economy, society and art and architecture.
Subject Code SEM-II - 11172	**F.Y.B.A.-**Early India: Post Mauryan Age to the Rashtrakutas**(Core Course-CC) SEM-II**
CO1	To understand the Process of History Writing. To get acquainted with referring skills and collecting sources for history writings. To understand importance of different types of language skills required for history writings
CO2	To understand the epochal and historical transitions. To impart knowledge and importance of literature in life. To get understanding how literature is mirror of society. The attempt is also to instill the spirit of enquiry among the students.
CO3	To under stand the role of administration in governance. To understand importance of agriculture and feudalism. This component also instills skills and critical ability of appreciation of various art forms including literature.
CO4	To understand the developments in early India after the Mauryas, which finally led to the transition to medieval India. The course is aimed at introducing the students to the developments in different parts of India through a brief study of regional kingdoms up to the tenth century C.E.
Subject Code SEM-III - 23174	**S.Y.B.A.-History History of Marathas 1630-1707 (Core Course-CC) SEM-III CC-1(3)**
CO1	To develop the ability to analyse sources for Maratha History. To

	understand the Process of History Writing. To get acquainted with referring skills and collecting sources for history writings. To understand importance of different types of language skills required for history writings
CO2	To instill learning ability of significance of regional history and political foundation of the region.
CO3	To enhance student's perception of 17th century Maharashtra and India in context of Maratha history
CO4	To instill ability of appreciation skills of leadership and the administrative system of the Marathas.
Subject Code SEM-III-23175	**S.Y.B.A.-Core Course I** CC-2(3) History of the Marathas: (1707- 1818) **Sem-IV**
CO1	To develop ability to analyze the Marathas policy of expansionism and its consequences.
CO1	To teach how to relate, key historical developments during medieval period occurring in one place with another.
CO3	To understand basic diplomatic skills. Students will be acquainted with the art of diplomacy in the Deccan region
CO4	To enrich the knowledge of the administrative skills and profundity of diplomacy
Subject Code-23171	**S.Y.B.A. DSE-A(3)Medieval India Sultanate Period (C**
CO1	To provide examples of sources used to study various periods in history. To understand the Process of History Writing. To get acquainted with referring skills and collecting sources for history writings. To understand importance of different types of language skills required for history writings
CO2	To teach how to relate, key historical developments during medieval period occurring in one place with another.
CO3	To teach student in analyzing socio - political and economic changes during medieval period.
CO4	To teach in estimating the foreign invasion and the achievement of rulers
Subject Code SEM-IV -	Discipline Specific Elective Course (DSE-1B) - 3 Credit Semester -IV-Medieval India: Mughal Perio
CO1	To teach how to Draw comparisons between policies of different rulers
CO2	To understand Role of Akbar in the consolidation of Mughal rule in India.

CO3	To understand Aurangzeb's conflict with Rajputas, Maratha and weakening Mughals age.
CO4	To analyses factors which led to the emergence of new religious ideas and movements (bhakti and Sufi)
Subject Code SEM-III-23172	Discipline Specific Elective Course (DSE-2A) - 3 Credit Semester -III-Glimpses of the Modern World - Part I
CO1	To develop overall understanding of modern world
CO2	To make student acquainted with the Renaissance major political, socio-religious and economic development during the modern world
CO3	To enhance their perception of the history of the Modern World.
CO4	To enable students to understand the significance of the intellectual, economic, political developments in the Modern World.
Subject Code SEM IV-23173	Discipline Specific Elective Course (DSE-2 B) - 3 Credit Semester -IV-Glimpses of the Modern World - Part I
CO1	To enable students to develop the overall understanding of the Modern World.
CO2	To make students acquainted with the major nationalist movements, the World War II and its consequences, the Cold War and its Consequences.
CO3	To enhance their overall perception of the history of the Modern World.
CO4	To enable students to understand the significance of the strategic political developments in the Modern World.
Subject Code SEM III 23176	Semester III- 2) Art and Architecture of Early India (From 3000 B.C. to 12th Century A.D.)
CO1	To make students overall understanding of the emergence and development of the art and architecture in early India
CO2	To attract the attention of students in order to, understand the emergence of the Pottery, Terracotta figures, Ornaments, Town Planning, preparation of seals and coins
CO3	To enhance understanding of the art and architecture in early India.
Subject Code SEM IV 23177	Skill Enhancement Courses (SEC 2B) – (2 Credits) Semester IV-6) Medieval Indian Arts and Architecture (1206 To 1857)
CO1	To enhance students overall understanding of Medieval Art and Architecture.
CO2	To enhance students overall understanding of the changing patterns of the Art and Architecture during the Medieval India.

CO3	To enhance students overall understanding of he impact of Persian Art on Islamic Art and Architecture in Medieval India.
Subject Code TY yearly pattern 3171	HISTORY OF THE WORLD IN 20TH CENTURY (1914 CENTURY (1914 CENTURY (1914-1992) General level Paper
CO1	To provide overall understanding of key concepts of world history
CO2	To make students acquainted with the global socio-political development that led to first world war and its consequences.
CO3	To enhance their overall perception of the Russian Geography and history
CO4	To enable students to understand values of democracy and rule of law vis-à-vis consequences of fascism and .
CO5	To understand the nature of trade cycles and in turn world depression
CO6	To make students acquainted with the global socio-political development that led to second world war and its consequences.
CO7	To make students aware about dynamics of economic development and factors and forces that were responsible for rise of world powers
CO8	To enhance understanding of Nonaligned movement
CO9	To understand forces and factors which were responsible for globalization
Subject Code SEM IV-3178	INTRODUCTION TO HISTORY INTRODUCTION TO HISTORY LEVEL: S3
CO1	To enhance conceptual understanding pertaining to various historiographical academic concepts of students.
CO2	To orient students about how history is studied, written and understood.
CO3	To explain methods and tools of data collection. To acquaint students with knowledge of type of sources and how the sources for writing history to be appreciated and used in history writings.
CO4	To make students aware about the exact method of history and how actually history is being practiced by historians. To study the Various Views of Historiography.
CO5	To acquire knowledge of preserving and making available historical documents to researchers.
CO6	To understand how all humanities and social sciences have close association in generating knowledge as well as the historical process of academic exercises that resulted due to osmosis from other humanities and social sciences.
CO7	To acquaint student with types, styles and various approaches of interpreting Indian Historiography.
CO8	To acquaint student with works of towering historian of

	Maharashtra who contributed immensely in regional history writing as well as in knowledge generation.
CO9	To acquaint student with works of towering historian of India who contributed immensely in overall history writing as well as in knowledge generation.
CO10	To taught students how to use sources in their presentation, understand the meaning of Evolution of Historiography, describe importance of inter-disciplinary research, introduce students to the basics of research, acquaint the student with the recent research in History
Subject Code SEM IV-23173	T.Y. B.A. yearly pattern S-4 HISTORY OF USA (1914 – HISTORY OF USA (1914 –1992
CO1	To enable students to develop the overall understanding of the Modern World. To acquaint Students about the main developments in the Contemporary World. To enhance conceptual understanding pertaining to history of America.
CO2	To orient the students with political history of Europe and how it was influenced by USA.
CO3	To acquire knowledge of various American policies between two world wars. To acquaint the students with the principles of foreign policy.
CO4	To acquaint student with the percept of Might is right in all world crises and USA. To acquaint the students with the principles of foreign policy.
CO5	To understand domestic polices of USA pertaining to civil right movement and rights of women
CO6	To make students acquire about the anxiety that American statesman faces due to rising tide of Communism and various orientations of American foreign policy due to that
CO7	To arose curiosity among the students in order to understand the American policies of intervention at various regional issues to fulfill its interests. To acquaint the students with the principles of foreign policy.
CO8	To make student more attentive to understand basic tenets of American foreign policy with respect to various regional allies and basic dynamics of cold war. To acquaint the students with the principles of foreign policy.
CO9	To make students aware about the tactics of USA that helped it to acquire resources of underdeveloped countries in order to built its own wealth. To understand basic tenets of American foreign policy with respect to Asia.
CO10	To enhance understanding of process, factors and criterion of mighty super powers of world

Couse Outcome Economics Department

1)	Program: B. COM. (Business Economics (Micro)Sem - II)
Course Code: 113	**FYBCOM: Business Economics Sem I**
CO1	To impart knowledge of business economics
CO2	To clarify micro economic concepts
CO3	To analyze and interpret charts and graphs
CO4	To understand basic theories, concepts of micro economics and their application
Course Code:-123	**FYBCOM: :Business Economics Sem II**
CO1	To understand the basic concepts of micro economics.
CO2	To understand the tools and theories of economics for solving the problem of decision making by consumers and producers.
CO3	To understand the problem of scarcity and choices.
CO4	To impart knowledge of business economics
Course Code:- 233	**S.Y.B.COM BUSINESS ECONOMICS (MACRO) SEM-III**
CO1	To familiarize the students to the basic theories and concepts of Macro Economics and their application.
CO2	To study the relationship amongst broad aggregates.
CO3	To impart knowledge of business economics.
CO4	To understand macroeconomic concepts.
Course Code:- 243	**S.Y.B.COM BUSINESS ECONOMICS (MACRO) SEM-IV**
CO1	To familiarize the students to the basic theories and concepts of Macro Economics and their application.
CO2	To help the students in analyzing the present status of the Indian Economy.
CO3	To understand the theories of money.

CO4	To understand the role of various committees on Banking Sector Reforms.
Course Code:- 303(A)_	**T.Y.B.COM Indian & Global Economic Development**
CO1	To expose students to a new approach to the study of the Indian Economy.
CO2	To help the students in analyzing the present status of the Indian Economy.
CO3	To enable students to understand the process of integration of the Indian Economy with other economics of the world.
CO4	To acquaint students with the emerging issues in policies of India's foreign trade.
	1) Program: B. A. (Economics)
Course Code:-	**F.Y.B.A. Indian Economy – Problems and Prospects G-I**
CO1	To acquaint the students with economic Law and Practice.
CO2	To understand the economical and its implications.
CO3	To make the Students aware of the economical activity.
CO4	To make the Students aware of the methods and theores about economical development.
Course Code:-	**S.Y.B.A. Modern Banking G-II**
CO1	To acquaint the students with economic Law and Practice in India
CO2	To understand the economical structure and its implications.
CO3	To make the Students aware of the economical activity in India
CO4	To make the Students aware of the methods and theories about economical development.
Course Code:-	**T.Y.B.A. Economic Development & Planning G-III**
CO1	To acquaint the students with economic Law and Practice in India
CO2	To understand the economical structure and its implications.
CO3	To make the Students aware of the economical activity in India
CO4	To make the Students aware of the methods and theories about economical development.
Course Code:-	**F.Y.B.A. Indian Economic Environment G-I Sem-I**

CO1	To familiarize the students with the recent developments in the Indian Economy
CO2	To provide the students with the background of the Indian Economy with focus on contemporary issues like economic environment.
CO3	To make the Students aware of the economical activity.
CO4	To enable students to understand and comprehend the current business scenario, agricultural scenario and other sectorial growth in the Indian context. To make the student aware of the developments such as MSMEs, Digital Economy, E-Banking, BPO & KPO, etc.
Course Code:-	**S.Y.B.A. Financial System-III**
CO1	To understand fundamentals of modern financial system
CO2	To understand the recent trends and developments in banking system.
CO3	To understand the role of the Reserve Bank of India in Indian financial system
CO4	To provide the knowledge of various financial and non-financial institutions.

Course Outcomes of Commerce Dept

Class	Subject Code	Subject Name	Learning Outcome
	112	Financial Accounting - I	1. Knowledge about various accounting Concepts, Conventions and Principles. 2. Understanding emerging trends in accounting and its effect on accounting Practices. • Knowledge about process of dissolution of partnership firm. Knowledge about single entry systems. 3. Purpose and advantages of double entry system • Process of conversion of single entry into double entry system. Knowledge about single entry systems. 4. Purpose and advantages of double entry system • Process of conversion of single entry into double entry system.

	114A	. Business Mathematics and Statistics - I OR	1.To understand the concept of Simple interest, compound interest, effect of compounding. 2. To understand the concept of Annuity and its applications for EMIs and Amortization Schedule. 3. To understand the concept of shares and mutual funds. To understand contribution of shares and mutual funds in systematic investment plans 4.To solve problems related to shares and mutual funds collection of data Analyzing and interpreting data. Knowing different method of sampling 5. To classify and represent data in tabular and graphical form. To compute various measures of central tendency and measures of dispersion.
	116	Optional Group. (B) (Any one of the Following) a)Essentials of E- Commerce b)Marketing & Salesmanship	a) Conceptual understanding of basics of ecommerce b) Awareness on the various forms of ecommerce c) Technical knowledge on registration of a domain 2. Practical Knowledge on role of Internet in ecommerce 3. Analytical skills and Creative skills for web page designing d) Practical Oriented Skills on E-commerce 2. Conceptual Clarity on Online Payment Process 3. Conceptual Clarity on EDI and Electronic 1. The basic knowledge of Market and Marketing will be developed amongst students. 2. Students will develop the Marketing Segmentation knowledge along with the basic concept of Marketing Mix. 3. Students will get proper insight of Product and Price Mix. 4. Students will develop the skills of promoting a product along with gaining knowledge about the distribution channels
	SEM 2		

	122	Financial Accounting - II	1. Students are expected to acquaint themselves with Computerized accounting, its application and utility. 2. Understanding the accounting process of accounting of charitable trusts 3. Recording basic accounting transactions and prepare annual financial statements 4. Learning the concept of intangible assets and the methods of their valuation. Understanding the process and methods of leasing.
	124A 124B	Business Mathematics and Statistics - II OR Computer Concepts and Application- II	1. To understand the concept of matrices and determinants. 2. To understand the application of determinant in solving linear equations 3. To understand applications of matrices and determinants in business and economics. 3. To understand the concept of LPP and its application in business and decision making. 4. To understand graphical method to solve business optimization problems with two variables. o use correlation for knowing the relationship between two variables. 5. To use regression for prediction 6. To know different types index numbers and problems in their construction. 7. To know the applications of various index numbers

	126	Optional Group. (B) (Any one of the Following) a) Essentials of E- Commerce b) Marketing & Salesmanship	1. Conceptual understanding of Electronic Data Interchange, documentation and merits of EDI. 2. Awareness about payment solutions, various payment methods and modern modes of digital payments. 3. Understanding of ECommerce security, precautions while using ECommerce and methods & Process of E-Commerce security. 4. Technical knowledge about virtual market and other business to business e- commerce communication. 1. Students will get the knowledge of Salesmanship and various approaches. 2. Techniques of salesmanship skills will be developed. 3. Awareness and importance of Rural Marketing amongst students. 4. Skills of Modern Marketing will be developed.
S.Y.B.Com	Course Code : 231	Business Communication	1. To understand the concept, process and importance of communication. 2. To develop awareness regarding new trends in business communication. 3. To provide knowledge of various media of communication. 4. To develop business communication skills through the application and exercises.

SYBCOM	Course Code: 232	Corporate Accounting	1. To acquaint the student with knowledge about various Concepts , Objectives and applicability of some important accounting standards associated with to corporate accounting. 2. To develop understanding among the students on the difference between commencement and incorporation of a company and the accounting treatment for transactions during the two phases. 3. To update the students with knowledge for preparation of final accounts of a company as per Schedule III of the Companies Act 2013 4. To empower to students with skills to interpret the financial statements in simple and summarized manner for effective decision making process. 5. To acquaint the student with knowledge about various Concepts , Objectives and applicability of some important accounting standards associated with to corporate accounting. 6. To develop understanding among the students on the difference between commencement and incorporation of a company and the accounting treatment for transactions during the two phases. 7. To update the students with knowledge for preparation of final accounts of a company as per Schedule III of the Companies Act 2013 8. To empower to students with skills to interpret the financial statements in simple and summarized manner for effective decision making process.
SYBCOM	Course Code: 234	Business Management	1. a. To provide basic knowledge and understanding about various concepts of Business Management. 2. b. To help the students to develop cognizance of the importance of management principles. 3. c. To provide an understanding about various functions of management. 4. d. To provide them tools and techniques to be used in the performance of the managerial job.
SYBCOM	Course Code: 235	Elements of Company Law.	1) 1. To develop general awareness of Elements of Company Law among the students. 2) 2. To understand the Companies Act 2013 and its provisions. 3) 3. To have a comprehensive understanding about the existing law on formation of new company in India. 4) 4. To create awareness among the students about legal environment relating to the company law. 5) 5. To acquaint the students on e-commerce, E governance and e-filling mechanism relating to Companies. 6) 6. To enhance capacity of learners to seek the career

			opportunity in corporate sector.
	206 – E.	Cost and Works Accounting Special Paper I	1. To prepare learners to know and understand the basic concepts of cost. 2. To understand the elements of cost. 3. To enable students to prepare a cost sheet 4. To facilitate the learners to understand, develop and apply the techniques of inventory control.
T.Y.B.Com	301.	Mercantile Law	1. To acquaint students with the basic concepts, terms & provisions of Mercantile and Business Laws. 2. To develop the awareness among the students regarding these laws affecting business, trade and commerce.
T.Y. B.Com.	302.	Advanced Accounting.	1. To impart the knowledge of various accounting concepts. 2. To instill the knowledge about accounting procedures, methods and techniques. 3. To acquaint them with practical approach to accounts writing by using software package.
T.Y. B.Com.	304	Auditing & Taxation	1. To acquaint themselves about the concept and principles of Auditing, Audit process, Assurance Standards, Tax Audit, and Audit of computerized Systems. 2. To get knowledge about preparation of Audit report. 3. To understand the basic concepts and to acquire knowledge about Computation of Income, Submission of Income Tax Return, Advance Tax, and Tax deducted at Source, Tax Collection Authorities under the Income Tax Act, 1961.
T.Y. B.Com.	305 – e.	Cost and Works Accounting Special Paper II	1. To provide Knowledge about the concepts and principles application of Overheads 2. To provide also understanding various methods of costing and their applications.
T.Y. B.Com.	306 – e.	Cost and Works Accounting Special Paper III	1 To impart knowledge regarding costing techniques. 2 To provide training as regards concepts, procedures and legal Provisions of cost audit.
T.Y. B.Com.	305 – h.	Marketing Management Special Paper II	I To understand the concept and functioning of marketing planning and sales management II. To know marketing strategies and organization III. To inform various facets of marketing with regulatory aspects IV. To understand marketing in globalize scenario
T.Y. B.Com.	306 – h.	Marketing Management Special Paper III	1. To know detailing of Marketing Research 2. To understand the role Brand and Distribution Management in marketing 3. To inform about Marketing and Economic Development 4. To Know of the importance of control on marketing activities

Course Outcomes of Physics Dept

Class	Course / Paper	Learning Outcomes
F.Y.B.Sc	Sem 1 pHY-111Mechanics and Properties of Matter PHY-112 Physics Principles and Applications PHY-113 Physics Laboratory-IA1.	To foster scientific attitude, provide in-depth knowledge of scientific and technological concepts of Physics. To enrich knowledge through problem solving, minor/major projects, seminars, tutorials, review of research articles/papers, participation in scientific events, study visits, etc. To familiarize with recent scientific and technological developments. To create foundation for research and development in Physics. To help students to learn various experimental and computational tools thereby developing analytical abilities to address real world problems. To train students in skills related to research, education, industry, and market. To help students to build-up a progressive and successful career in Physics
.	Sem2 Compulsory Course PHY-121Heat and Thermodynamics PHY-122Electricity and Magnetism PHY-123Physics Laboratory-IB	
S.Y.B.Sc.	**Semester - I** **Paper-I :** **PH211 :** Mathematical Methods in Physics - I	• Understand the complex algebra useful in physics courses • Understand the concept of partial differentiation. • Understand the role of partial differential equations • Understand vector algebra • Understand the singular points of differential equation
	Semester - I **Paper-II :** **PH212:** Electronics - I	• To apply laws of electrical circuits to different circuits. • To understand the relations in electricity • To understand the properties and working of transistors. • To understand the functions of operational amplifiers.

		• To design circuits using transistors and operational amplifiers. • To understand the Boolean algebra and logic circuits.
	Semester - II **Paper – I** **PH221:** Oscillations, Waves and Sound	• To understand the physics and mathematics of oscillations. • To solve the equations of motion for simple harmonic, damped, and forced oscillators and understand their physical content in a variety of applications along with their problems. • To describe oscillatory motion with graphs and equations, and use these descriptions to solve problems of oscillatory motion. • To explain oscillation in terms of energy exchange, giving various examples. • To understand the mathematical description of travelling and standing waves and the one-dimensional classical wave equation and solutions to it. • To explain the Doppler effect, and predict in qualitative terms the frequency change that will occur for a stationary and a moving observer. • To define the decibel scale qualitatively, and give examples of sounds at various levels. • To explain in qualitative terms how frequency, amplitude, and wave shape affect the pitch, intensity, and quality of tones produced by musical instruments
	Semester - II **Paper – II** **PH222:** OPTICS	• To understand to acquire the basic concepts of wave optics. • To describe how light can constructively and destructively interfere • To explain why a light beam spreads out after passing through an aperture • To summarize the polarization characteristics of electromagnetic waves • To appreciate the operation of many modern optical devices that utilize wave optics •To understand optical phenomena such as polarization, birefringence, interference and diffraction in terms of the wave model and to analyze simple examples of interference and diffraction phenomena. • To be familiar with a range of equipment used in modern optics.
	PH223: Practical Course	• To use various instruments and equipment. • To design experiments to test a hypothesis and/or determine the value of an unknown quantity. • To investigate the theoretical background to an experiment. • To set up experimental equipment to implement an experimental approach and to analyze data, plot appropriate graphs and reach conclusions from your data analysis. • To work in a group to plan, implement and report on a project/experiment.
T.Y.B.S	**Semester - III**	• To understand the Cartesian, spherical polar cylindrical and

c.	**Paper-I :** **PH331 :** Mathematical Methods in Physics - II	general curvilinear co ordinate system. • To understand the partial differential equation method of separation of variables frobenius method for power series solution. • To understand the special function legendre hermite and Bessel function with its generating function. • To understand the Newtonian relativity , Michelson Morley experiment and concept of special theory of relativity.
	Semester - III **Paper-II :** **PH332 :** Solid State Physics	• Understand the properties of metals on the basis of the free and nearly-free electron gas models. • Understand the magnetic properties of condensed matter. • Understand the optical properties of solids and the relation to their electronic properties.
	Semester - III **Paper-III :** **PH333 :** Classical Mechanics	• Understand the Newtonian mechanics and solve the problem related the motion of system of particles. • Understand central force and their features Kepler's laws of planetary motion. • Understand the scattering of particles with laboratory and center of mass system. • Understand the Hamiltonian formulations. • Understand the passion bracket.
	Semester - III **Paper-IV :** **PH334 :** Atomic and Molecular Physics	• Understand the atomic structure. • Understand the Pauli's exclusive principle and spinorbit interaction. • Understand the concept of Zeeman effect , Raman effect. • Understand the concept of X rays spectroscopy. • Understand the types of molecular spectroscopy.
	Semester - III **Paper-V :** **PH335 :** Computational Physics	• To identify modern programming methods and describe the extent and limitations of computational methods in physics. • To identify and describe the characteristics of various numerical methods. • To formulate and computationally solve a selection of problems in physics. • To use the tools, methodologies, language and conventions of physics to test and communicate ideas and explanations.
	Semester - III **Paper-VI :** **PH336 : (Optional)** Renewable Energy Sources	• To describe the various renewable energy sources and the possible conversion paths to a useful form of energy. • To study the different Characteristics of Sun. • To explain the principles that underlie the ability of various natural phenomena to deliver solar energy and to study the technologies that are used to harness the power of solar energy. • To discuss the positive and negative aspects of solar energy in relation to natural and human aspects of the environment. • To describe the working principle of photovoltaic effect in

		solar cell and to discuss its use as the integration of intermittent
		renewable electricity into the grid system through laboratory exercises and its efficiency. • To study the wind energy and its power, energy production and the effect of the blade design. • To describe how biomass is used as a source of energy in providing energy and in producing alternative fuels.
	Semester - IV **Paper-I :** **PH341 :** Classical Electrodynamics	• To study the formulation of Maxwell's equations. • To use the Lorentz transformation to transform fields and sources from one inertial frame to another. • To illustrate the boundary value problems of electrodynamics. • To derive detailed expressions for the nature of electromagnetic power emitted by various sources. • To apply Maxwell's equations to solve problems in classical electrodynamics. • To understand transport of energy and Poynting vector.
	Semester - IV **Paper-II :** **PH342 :** Quantum Mechanics	• To study the historical aspects of development of quantum mechanics. • To understand and explain the differences between classical and quantum mechanics. • To understand the idea of wave function. • To understand the uncertainty relations. • To solve Schroedinger equation for simple potentials. • To study, identify and relate the eigenvalue problems for energy, momentum, angular momentum and central potentials with the idea of spin.
	Semester - IV **Paper-III :** **PH343 :** Thermodynamics and Statistical	• To identify and describe the statistical nature of concepts and laws in thermodynamics, in particular: entropy, temperature, chemical potential, Free energies, partition functions. • To use the statistical physics methods, such as Boltzmann

	Physics	distribution, Gibbs distribution, Fermi-Dirac and Bose-Einstein distributions to solve problems in some physical systems. • To apply the concepts and principles of black-body radiationto analyze radiation phenomena in thermodynamic systems. • To apply the concepts and laws of thermodynamics to solve problems in thermodynamic systems such as gases, heat engines and refrigerators etc. • To analyze phase equilibrium condition and identify types of phase transitions of physical systems. • To design, set up, and carry out experiments; analyze data recognizing and accounting for errors; and compare with theoretical predictions.
	Semester - IV **Paper-IV :** **PH343 :** Nuclear Physics	• To describe the properties and structure of stable nuclei. • To understand the properties of the nuclear force properties and their theoretical descriptions. • To the constraints on a quantum model of the nucleus.
		• To understand the shell model and be able to explain radioactive processes. • To study beta decays and its properties for nuclear reactions. • To demonstrate quantitative problem solving skills in all the topics covered.
	Semester - IV **Paper-V :** **PH345 :** Electronics - II	• To understand the basic working principles of different semiconductor diodes. • To classify the different types of amplifiers with reference to their mode of operation, efficiency. • To study the basic working principle and characteristics of JFETs, MOSFETs and their applications. • To study the different applications of OPAMP and Timer circuits with illustrative problems. • To study the special ICs designed for regulator power supply and their characteristics. • To the different combinational and sequential logic circuits and their applications.
	Semester - IV **Paper-VI :** **PH346 : Optional**	• To understand the fundamentals of microcontroller systems . • To study the architecture of Microcontroller 8051. • To study the programming model, working principle of

	Microcontrollers	assembler; assembler directives. • To use instruction set of assembly languages of 8051microcontroller in developing programs. • To interface to external memory, use of stack in subroutine calls and interrupt services, access of built-in I/O ports, timers and counters. • To study I/O Interfacing of the different applications like keyboard scanning, display multiplexing, LCD controllers, interface of IC's analogue and digital conversion (ADC / DAC), serial interface standards RS-232 in communication systems.
	PH347: Laboratory Course -I	• To design experiments in General Physics to test a hypothesis and/or to determine the value of an unknown quantity. • To investigate the theoretical background to an experiment. • To set up experimental equipment to implement an experimental approach and to analyze data, plot appropriate graphs and reach conclusions from your data analysis. • To work in a group to plan, implement and report on a project/experiment.
	PH348: Laboratory Course -II	• To design experiments in Applied Physics to test a hypothesis and/or determine the value of an unknown quantity. • To set up experimental equipment to implement an experimental approach and to analyze data, plot appropriate graphs and reach conclusions from your data analysis. • To formulate and computationally solve a selection of problems
		in physics using C programming. • To demonstrate the interfacing techniques for General Physics experiments using Phoenix / Pinnacle Microcontroller Software.
	PH349: Laboratory Course -III (Project Work)	• To develop a set of skills pertaining to the project work with necessary involvement of student under the proper guidance. • To develop a clear and strong link with the principles of basic physics and/or their applications through project work. • To understand the theme chosen should be such that it promotes better understanding of physics concepts and brings out the creativity by that student. • To evaluate the project work periodically with experimental work and data/observations. • To present the final report for the viva voce with necessary references and which is clearly referred to and acknowledged by the guide. • To face the viva voce at least for 30 minutes with proper presentation of experimental data/observations, results and conclusion.

Course Outcomes of Chemistry Dept

Course Code:-Paper-II	FY BSc Inorganic and Organic Chemistry Sem I
	The fundamental concepts which govern the structure, bonding, properties and reactivities of organic molecules such as covalent character, hybridization, bond angles, bond energies, bond polarities and shapes of molecules
CO2	Drawing of organic molecules and arrow pushing concept.
CO3	Acid-base theories, pKa / pKb values for common organic acids and bases and factors affecting strength of acids and bases.
CO4	Structural effects and their applications in determining strength of acids and bases.
CO5	The common and IUPAC names of alkanes, alkenes, alkynes and homocyclic, polycyclic aromatic hydrocarbons.
CO6	Methods of preparation and chemical reactions of alkanes, alkenes, alkynes and homocyclic, polycyclic aromatic hydrocarbons.
CO7	Application of Huckel's rule to different organic compounds to find out aromatic /non aromatic characters.
CO8	Skeleton of long form of periodic table
CO9	Quantum numbers
CO10	Shells, sub-shells, types of orbital and their shapes
CO11	Afbau, Paulin's exclusion principle and Hunds rule
CO12	Block, group, periodic law and periodicity
CO13	Name, symbol, electronic configuration, trends and properties
CO14	Crown ether and cryptans
CO15	Separation of s-block elements with crown ethers
CO16	Compounds of s-block elements: oxides, hydroxides, peroxides and superoxides
CO17	Application of s-block elements: Industrial, biological and agricultural field
Course Code:Paper II	**FY BSc: Inorganic and Organic Chemistry Sem II**
CO1	Structure, nomenclature, preparation and reactions of organic compounds.
CO2	Structure, nomenclature, preparation and reactions of organic compounds.
CO3	Predict the conversion of one functional group into other functional group involving one or more number of steps.
CO4	Conversion of the given compound into other compound containing more or less number of carbon atoms.
CO5	Prediction of possible products when reactants are given. In case there are more than

	one possible products, identify the major and minor products.
CO6	Suggest the possible reagents to bring about the given conversion.
CO7	Concept of isomerism, types of isomers and representation of organic molecules.
CO8	Conformational isomerism in alkanes with energy profile diagram.
CO9	Concept of geometrical isomerism with E/Z nomenclature
CO10	Understanding of optical activity, isomer number, tetrahedral carbon atom, concept of chirality, enantiomerism, R/S nomenclature for single chiral centre.
CO11	To write electronic configuration of any element.
CO12	To give reasons for anomolous behavior of first element of IIIA to VII A groups with other
CO13	To know the exact position p-block elements in the long form of the periodic table.
CO14	To know the allotropes of carbon.
CO15	Basic compounds of boron, aluminum, silicon
CO16	Concept of oxyanions, different than mineral acids, oxyacids of phosphorous & sulphur
CO17	Overlpping of atomic orbitals of halogens, interhalogen compounds
Course Code:- CH 212	**S.Y. B.Sc: Organic and Inorganic Chemistry Paper II Sem I**
CO1	Identify chiral center in the given organic compounds.
CO2	Define Erythro, threo, meso, diasteroisomers with suitable examples.
CO3	Able to find R/S configuration in compounds containing two chiral centers.
CO4	Explain Bayer's strain theory, Heat of combustion and relates stability of cycloalkanes.
CO5	Explain the stability of cyclohexanes.
CO6	Draw the structure of boat and chair configuration of cyclohexane.
CO7	Draw axial and equatorial bonds in cyclohexane.
CO8	Draw structure of conformations of mono- & disubstituted cyclohexanes
CO9	Explain the stability of axial and equatorial conformation of monosubstituted cyclohexanes.
CO10	Define and classify heterocyclic compounds.
CO11	Use Huckel rule to predict aromaticity.
CO12	Suggest synthetic route for preparation of various heterocyclic compounds.
CO13	Write and complete various reactions of heterocyclic compounds.
CO14	Predict products.
CO15	To differentiate between ore and minerals.
CO16	To differentiate between calcination and roasting and smelting.

CO17	To know the different methods for separation of gangue or matrix from metallic compounds.
CO18	To know the terms smelting, flux.
CO19	To know physico-chemical principles involved in electrometallurgy.
CO20	To understand electrolysis of alumina and its refining.
CO21	To explain the uses of Aluminum and its alloys.
CO22	To know purification of bauxite ore.
CO23	To explain the term pyrometallurgy and to explain the physico chemical principles involved in the reduction process by carbon monoxide.
CO24	To know different reactions in the blast furnace
CO25	To differentiate between properties of pig iron and wrought iron.
CO26	To explain the basic principles of different methods for preparation of steel.
CO27	To explain the merits and demerits of different methods.
CO28	Definition of corrosion, Types of corrosion, Mechanism of corrosion, Factors affecting corrosion.
CO29	Methods of prevention of metal from corrosion, Meaning of passivity, Different theories of passivity, Galvanising, Tinning, Electroplating from corrosion
Course Code:- CH 222	**S.Y. B.Sc.: Organic and Inorganic Chemistry Paper II Sem II**
CO1	Concept of different reagents used in the one type of conversion
CO2	Merits & demerits of different reagents
CO3	Reagent based mechanisms
CO4	Use of different hydrogen donors for hydrogenation
CO5	Define and classify heterocyclic compounds.
CO6	Use Huckel rule to predict aromaticity.
CO7	Suggest synthetic route for preparation of various heterocyclic compounds.
CO8	Write and complete various reactions of heterocyclic compounds.
CO9	Predict products.
CO10	Know different biomolecules.
CO11	Appreciate the role of biochemistry in the day to day life.
CO12	Understand the importance of biochemistry.
CO13	Define carbohydrates, Classify carbohydrates giving suitable examples, Write and complete various reactions of glucose
CO14	Explain optical activity in carbohydrates, Write Fischer projection and perspective formula with glyceraldehydes as reference compound.
CO15	Explain the principle in Killani Fischer synthesis, Explain stereoisomerism in monosaccharide.
CO16	Draw structure of some common aldoses and ketoses.
CO17	Distinguish between diastereomers and epimers.

CO18	Write cyclic structure of glucose in Fischer, Haworth and chair form.
CO19	Know the phenomenon of mutaroatation.
CO20	Draw the structure and bonding in maltose, lactose, cellobiose and sucrose.
CO21	Know about polysaccharide, structures of starch and cellulose
CO22	Classify the naturally occurring amino acids.
CO23	Explains the amphoteric nature of amino acids.
CO24	Know the important reactions of α-amino acids
CO25	Outline the formation of peptide bond.
CO26	Explain the hydrogen bonding in α-helical structure.
CO27	Relate the stability of α-helical chain and their R-groups.
CO28	Define primary, secondary, tertiary and quaternary structure of proteins and Classify proteins.
CO29	To know position of d-block elements in periodic table.
CO30	To know the general electronic configuration & electronic configuration of elements.
CO31	To know trends in periodic properties of these elements w.r.t. size of atom and ions, reactivity, catalytic activity, oxidation state, complex formation ablility, colour, magnetic properties, non-stoichiometry, density, melting point, boiling point.
CO32	To understand M-C bond and to define organometallic compounds
CO33	To define organometallic chemistry
CO34	To understand the multiple bonding due to CO ligand.
CO35	To know methods of synthesis of binary metal carbonyls.
CO36	To understand the structure and bonding using valence electron count (18 electron rule)
CO37	To understand the catalytic properties of binary metal carbonyls
CO38	To understand the uses of organometallic compounds in the homogenous catalysis.
CO39	To define acids and bases according to Arrhenius theory Lowery- Bronsted concept, Lewis concept.
CO40	To explain the merits and demerits of different theories of acids and bases.
CO41	To define the conjugate acid and base pairs
CO42	To explain the leveling effect of solvents.
CO43	To demonstrate the trends in the strength of hydracids, oxyacids.
CO44	To define hard and soft acids
CO45	To know the trends in the strength of hydra and oxyacids.
CO46	To know the rules governing the strength of oxyacids.
CO47	To explain the properties of a solvent that determines their utility.
CO48	To know some useful solvents.
CO49	To explain the reactions in non-aqueous solvents like HF and NH3.
CO50	To know toxic chemical in the environment.

CO51	To know the impact of toxic chemicals on enzyme
CO52	To know the biochemical effect of Arsenic, Cd, Pb, Hg.
CO53	To explain biological methylation.
Course Code:- CH 203	**SYBSc .: Practical Course in Chemistry**
CO1	Verify theoretical principles experimentally
CO2	Interpret the experimental data
CO3	Improve analytical skills
CO4	Correlate the theory and experiments and understand their importance
CO5	Verify theoretical principles experimentally.
CO6	Acquire skill of crystallisation, record correct m. p. / b. p.
CO7	Perform the complete chemical analysis of the given organic compound and should be able to recognize the type of compound.
CO8	Write balanced equation for all the reactions, they carry in the laboratory
CO9	Perform the given organic preparation according to the given procedure.
CO10	Follow the progress of the reaction by using TLC technique.
CO11	Set up the apparatus properly for the given experiments
CO12	Perform all the activities in the laboratory with neatness and cleanness.
Course Code:- CH 333	**TYBSc.: Organic Chemistry Paper III Sem III**
CO1	Definition and types of organic acid and base
CO2	The pka and pkb concepts, Effect of temperature on pka/pkb
CO3	Comparison between strengths of acids/bases
CO4	What is acid-base catalysis
CO5	To draw different types of disubstituted cyclohexane in Chair form
CO6	To distinguish between geometrical and optical isomerism
CO7	Stability, energy calculations with potential energy diagram and optical activity of these conformers.
CO8	Definition and type of nucleophiles and leaving groups
CO9	Different types of nucleophilic substitution reactions
CO10	Definition of inversion and racemization
CO11	The kinetics, mechanism & stereochemistry of these reactions
CO12	Whether a given reaction follows SN1 or SN2 mechanism?
CO13	The comparison between SN1 & SN2 reactions
CO14	An SNi mechanism in presence and absence of pyridine
CO15	To predict product/s or supply the reagent/s for these reactions
CO16	Different types of carbon-carbon unsaturated compounds
CO17	Different types of carbon-carbon unsaturated compounds

CO18	The structure of carbonyl group
CO19	Reactivity concept
CO20	Correct mechanism of addition reactions using different reagents
CO21	Types of some known addition reactions
CO22	Definition and types of elimination reactions
CO23	Different types of bases and leaving group
CO24	Statement of Hoffmann and Saytzeff rule
CO25	The evidences, mechanism & stereochemical aspects of these reactions
CO26	Whether a given reaction follows E1, E2 or E1cB mechanism?
CO27	Comparison between E1 & E2 reactions
CO28	The effect of structure, attacking and leaving group on reactivity of such reactions
CO29	Definition and types of aromatic substitution reactions
CO30	Classification of directing groups
CO31	What is an arenium ion and Ipso substitution?
CO32	The evidences, reactivity and mechanism of these reactions
CO33	Whether a given reaction follows addition-Elimination or Elimination-addition mechanism?
Course Code:- CH 343	**TY BSc .: Organic Chemistry Paper-III Sem IV**
CO1	Definition and formation of carbanions
CO2	Possible mechanism of some known name reactions involving carbanions
CO3	Synthetic applications some reagents
CO4	To predict product/s or supply the reagent/s for these reactions
CO5	Meaning of terms Disconnection, Synthons, Synthetic equivalence, Functional Group Interconversion, Target Molecule
CO6	What is retrosynthesis?
CO7	Various steps involved in the synthesis of some molecules (detailed mechanism is not expected)
CO8	What is rearrangement reaction?
CO9	Different types of intermediate in rearrangement reactions?
CO10	What is Spectroscopy?
CO11	Different regions of electromagnetic radiations
CO12	Various terms used in spectroscopy
CO13	What is the interaction of radiation with matter
CO14	Types of energy levels with diagram
CO15	Brief idea about the advantages of spectroscopic methods
CO16	What is UV Spectroscopy and Beer's law?
CO17	Different types of electronic excitations
CO18	Various terms used in UV spectroscopy

CO19	What is the effect of conjugation on UV band
CO20	To calculation of λmax for dienes and enone systems
CO21	Define colour?
CO22	What is the range of vision region ?
CO23	Applications of UV Spectroscopy
CO24	What is IR Spectroscopy?
CO25	To calculate fundamental modes of vibrations for a given molecule
CO26	Which factors affect IR band position?
CO27	To distinguish compounds by this spectroscopic method
CO28	To determine structure and follow the course of reaction by IR spectrum
CO29	What is the principle of PMR?
CO30	Various terms used in PMR spectroscopy.
CO31	Why TMS is used as a reference compound?
CO32	To distinguish compounds by PMR
CO33	What are terpenoids and alkaloids?
CO34	Various methods of isolation/extraction of these natural products
CO35	Synthesis of Citral and Ephedrin by Barbier- Bouveault and Nagi methods, respectively.
CO36	To determine the structure of above compounds by chemical methods.
Course Code:-CH 349	**TY BSc .: Organic Chemistry Practical**
CO1	Verify theoretical principles experimentally
CO2	Interpret the experimental data
CO3	Improve analytical skills
CO4	Correlate the theory and experiments and understand their importance
CO5	Verify theoretical principles experimentally.
CO6	Acquire skill of crystallisation, record correct m. p. / b. p.
CO7	Perform the complete chemical analysis of the given organic compound and should be able to recognize the type of compound.
CO8	Write balanced equation for all the reactions, they carry in the laboratory
CO9	Perform the given organic preparation according to the given procedure.
CO10	Follow the progress of the reaction by using TLC technique.
CO11	Set up the apparatus properly for the given experiments
CO12	Perform all the activities in the laboratory with neatness and cleanness.
Course Code:- CH 102	**FY BSc (CBCS) .: Organic Chemistry (DSCC) Sem I**
CO1	The students are expected to understand the fundamentals, principles, and recent developments in the subject area.
CO2	It is expected to inspire and boost interest of the students towards chemistry as themain subject.

CO3	To familiarize with current and recent developments in Chemistry.
CO4	To create foundation for research and development in Chemistry.
Course Code:-CH 103	**FY BSc (CBCS).: Chemistry Practical Course-I (DSCC) Sem I**
CO1	Importance of chemical safety and Lab safety while performing experiments in laboratory
CO2	Determination of thermochemical parameters and related concepts
CO3	Techniques of pH measurements
CO4	Preparation of buffer solutions
CO5	Elemental analysis of organic compounds (non instrumental)
CO6	Chromatographic Techniques for separation of constituents of mixtures
Course Code:- CH 201	**FYBBSc (CBCS).: Inorganic Chemistry Sem II**
CO1	Various theories and principles applied to revel atomic structure
CO2	Origin of quantum mechanics and its need to understand structure of hydrogen atom
CO3	Schrodinger equation for hydrogen atom
CO4	Radial and angular part of hydrogenic wave functions
CO5	Significance of quantum numbers
CO6	Shapes of orbitals
CO7	Explain rules for filling electrons in various orbitals- Aufbau's principle, Pauli exclusion principle, Hund's rule of maximum multiplicity
CO8	Discuss electronic configuration of an atom and anomalous electronic configurations.
CO9	Describe stability of half-filled and completely filled orbitals.
CO10	Discuss concept of exchange energy and relative energies of atomic orbitals
CO11	Design Skeleton of long form of periodic table.
CO12	Describe Block, group, modern periodic law and periodicity
CO13	Classification of elements as main group, transition and inner transition elements
CO14	Write name, symbol, electronic configuration, trends and properties.
CO15	Explain periodicity in the following properties
CO16	Attainment of stable electronic configurations.
CO17	Define various types of chemical bonds- Ionic, covalent, coordinate and metallic bond
CO18	Explain characteristics of ionic bond, types of ions, energy consideration in ionic bonding, lattice and solvation energy and their importance in the context of stability and solubility of ionic compounds
CO19	Summarize Born-Lande equation and Born-Haber cycle,
CO20	Define Fajan's rule, bond moment, dipole moment and percent ionic character.

CO21	Describe VB approach, Hybridization with example of linear, trigonal, square planer, tetrahedral, TBP, and octahedral.
CO22	Discuss assumption and need of VSEPR theory.
CO23	Interpret concept of different types of valence shell electron pairs and their contribution in bonding.
CO24	Application of non-bonded lone pairs in shape of molecule
CO25	Basic understanding of geometry and effect of lone pairs with examples such as ClF3, Cl2O, BrF5, XeO3 and XeOF4.
Course Code:- CH 203	**FYBSc (CBCS).: Chemistry Practical II Sem IV**
CO1	Inorganic Estimations using volumetric analysis
CO2	Synthesis of Inorganic compounds
CO3	Analysis of commercial products
CO4	Purification of organic compounds
CO5	Preparations and mechanism of reactions involved
Course Code: CH 302	**SYBSc (CBCS) .: Inorganic and Organic Chemistry (DSCC) Sem III**
CO1	Define terms related to molecular orbital theory (AO, MO, sigma bond, pi bond, bond order, magnetic property of molecules, etc).
CO2	Explain and apply LCAO principle for the formation of MO's from AO's.
CO3	Explain formation of different types of MO's from AO's.
CO4	Distinguish between atomic and molecular orbitals, bonding, anti-bonding and nonbonding molecular orbitals.
CO5	Draw and explain MO energy level diagrams for homo and hetero diatomic molecules. Explain bond order and magnetic property of molecule.
CO6	Explain formation and stability of molecule on the basis of bond order.
CO7	Apply MOT to explain bonding in diatomic molecules other than explained in syllabus.
CO8	Define different terms related to the coordination chemistry (double salt, coordination compounds, coordinate bond, ligand, central metal ion, complex ion, coordination number, magnetic moment, crystal field stabilization energy, types of ligand, chelate effect, etc.)
CO9	Explain Werner's theory of coordination compounds. Differentiate between primary and secondary valency. Correlate coordination number and structure of complex ion.
CO10	Apply IUPAC nomenclature to coordination compound.

CO11	Identify and draw the structures aromatic hydrocarbons from their names or from structure name can be assigned.
CO12	Explain / discuss synthesis of aromatic hydrocarbons.
CO13	Give the mechanism of reactions involved.
CO14	Explain /Discuss important reactions of aromatic hydrocarbon.
CO15	To correlate reagent and reactions.
CO16	Identify and draw the structures alkyl / aryl halides from their names or from structure name can be assigned.
CO17	Explain / discuss synthesis of alkyl / aryl halides.
CO18	Write / discuss the mechanism of Nucleophilic Substitution (SN1, SN2 and SNi) reactions.
CO19	Explain /Discuss important reactions of alkyl / aryl halides
CO20	Give synthesis of expected alkyl / aryl halides.
CO21	Identify and draw the structures alcohols / phenols from their names or from structure name can be assigned.
CO22	Able to differentiate between alcohols and phenols
CO23	Explain / discuss synthesis of alcohols / phenols.
CO24	Write / discuss the mechanism of various reactions involved.
CO25	Explain /Discuss important reactions of alcohols / phenols.
CO26	To correlate reagent and reactions of alcohols / phenols
CO27	Give synthesis of expected alcohols / phenols.
Course Code:- CH 303	**SYBSc(CBCS) .: Practical Chemistry III Sem III**
CO1	Verify theoretical principles experimentally
CO2	Interpret the experimental data on the basis of theoretical principles
CO3	Correlate theory to experiments. Understand/verify theoretical principles by experiment observations; explain practical output / data with the help of theory.
CO4	Understand systematic methods of identification of substance by chemical methods.
CO5	Write balanced equation for the chemical reactions performed in the laboratory.
CO6	Perform organic and inorganic synthesis and is able to follow the progress of the chemical reaction by suitable method (colour change, ppt. formation, TLC)
CO7	Set up the apparatus / prepare the solutions - properly for the designed experiments.
CO8	Perform the quantitative chemical analysis of substances explain principles behind it.
CO9	Systematic working skill in laboratory will be imparted in student.

Subject Code: CH 402	SYBSc (CBCS): Inorganic and Organic Chemistry (DSCC) Sem IV
CO1	Isomerism in coordination complexes
CO2	Explain different types of isomerism in coordination complexes.
CO3	Apply principles of VBT to explain bonding in coordination compound of different geometries.
CO4	Correlate no of unpaired electrons and orbitals used for bonding.
CO5	Identify / explain / discuss inner and outer orbital complexes.
CO6	Explain / discuss limitation of VBT.
CO7	Explain principle of CFT.
CO8	Apply crystal field theory to different type of complexes (Td, Oh, Sq. Pl complexes)
CO9	Explain: i) strong field and weak field ligand approach in Oh complexes ii) Magnetic properties of coordination compounds on the basis of weak and strong ligand field ligand concept. iii) Origin of colour of coordination complex.
CO10	Calculate field stabilization energy and magnetic moment for various complexes.
CO11	To identify Td and Sq. Pl complexes on the basis of magnetic properties / unpaired electrons.
CO12	Explain spectrochemical series, tetragonal distortion / Jahn-Teller effect in Cu(II) Oh complexes only.
CO13	Identify and draw the structures aldehydes and ketones from their names or from structure name can be assigned
CO14	Explain / discuss synthesis of aldehydes and ketones.
CO15	Write / discuss the mechanism reactions aldehydes and ketones.
CO16	Explain /Discuss important reactions of aldehydes and ketones.
CO17	To correlate reagent and reactions of aldehydes and ketones
CO18	Give synthesis of expected aldehydes and ketones.
CO19	Perform inter conversion of functional groups.
CO20	Identify and draw the structures carboxylic acids and their derivatives from their names or from structure name can be assigned.
CO21	Explain / discuss synthesis of carboxylic acids and their derivatives.
CO22	Write / discuss the mechanism reactions carboxylic acids and their derivatives.
CO23	Explain /Discuss important reactions of carboxylic acids and their derivatives.
CO24	Correlate reagent and reactions of carboxylic acids and their derivatives
CO25	Give synthesis of expected carboxylic acids and their derivatives.
CO26	Identify and draw the structures amines from their names or from structure name can be assigned.
CO27	Explain / discuss synthesis of amines.

CO28	Write / discuss the mechanism reactions amines and their derivatives.
CO29	Explain /Discuss important reactions of amines and their derivatives.
CO30	Correlate reagent and reactions of amines and their derivatives
CO31	Give synthesis of expected amines and their derivatives.
CO32	Give synthesis diazonium salt from amines and reactions of diazonium salt
CO33	Draw the structures of different conformations of cyclohexane.
CO34	Define terms such as axial hydrogen, equatorial hydrogen, confirmation, substituted cyclohexane, etc.
CO35	Convert one conformation of cyclohexane to another conformation and should able to identify governing structural changes.
CO36	Explain / discuss stability with respect to potential energy of different conformations of cyclohexane.
CO37	Draw structures of different conformations of methyl / t-butyl monosubstituted cyclohexane (axial, equatorial) and 1, 2 dimethyl cyclohexane.
CO38	Identify cis- and trans-isomers of 1, 2 dimethyl substituted cyclohexane and able to compare their stability.
Subject Code: CH 403	**SYBSc (CBCS)-Practical Chemistry Sem IV**
CO1	Verify theoretical principles experimentally
CO2	Interpret the experimental data on the basis of theoretical principles.
CO3	Correlate the theory to the experiments. Understand / verify theoretical principles by experiment or explain practical output with the help of theory.
CO4	Understand systematic methods of identification of substance by chemical methods.
CO5	Write balanced equation for all the chemical reactions performed in the laboratory.
CO6	Perform organic and inorganic synthesis and able to follow the progress of the chemical reaction.
CO7	Set up the apparatus properly for the designed experiments.
CO8	Perform the quantitative chemical analysis of substances and able to explain principles behind it.

Program: B.Sc. (Botany)

Course Code: BO 111	**F.Y.B.Sc. : Paper Title -Plant life and Utilization I Sem –I**
CO1	Students can understand the General identification characters of the lower and higher group of plant taxa.

CO2	Understand general characteristics and classification of the Algae, fungi, lichens and Bryophytes.
CO3	Life cycle of the *Spirogyra*, *Mushrooms* and *Riccia* with its Utilization and economic importance.
Course Code: BO 112	**F.Y.B.Sc. :Paper –II Plan Morphology and Anatomy Sem –I**
CO1	Students know importance of the Morphology for the identification, Nomenclature, Classification, and Plant breeding.
CO2	Understanding about the parts, types and functions of the Inflorescence, flower and fruit for identification.
CO3	Understand the tissue organization of the plant body, its functions and applications.
Course Code: BO 121	**F.Y.B.Sc - Paper –I Plant life and Utilization II Sem –II**
CO1	Introduction of the Plant diversity with study of the Pteridophytes, Gymnosperms and Angiosperms.
CO2	Study of the General characteristics and classification of the Pteridophytes, Gymnosperms, and Angiosperms.
CO3	Know the Utilization and economic importance of the Pteridophytes, Gymnosperms and Angiosperms.
CO4	Study of life cycle of the *Nephrolepis, Cycas.*
Course Code: BO 122	**F.Y.B.Sc - Paper –II Principles of plant Science Sem –II**
CO1	Know the basic concepts about the plant physiology and cell biology.
CO2	Understand the physiological processes like Diffusion, Imbibition, Osmosis, Plasmolysis, plant growth, and growth regulators.
CO3	The study of the types and Ultrastructure of the cell and different cell organelles.
CO4	Study the cell cycle in plants.
Course Code: BO 113 BO 123	**F.Y.B.Sc Practical based on BO 111 and BO 112 and Practical based on Bo 121 and Bo 122**
CO1	Study life cycle of the Lower and Higher cryptogamic plants with respect to morphological and Anatomical characteristics
CO2	Utilization and economic importance of the plants.
CO3	Study the Plasmolysis process in plants.
CO4	Estimation of the chlorophyll and carotenoids content of the plant.
CO5	Extraction of the DNA from the plant tissue.
CO6	Study of the cytological techniques –Mitosis and Meiosis cell division.
CO7	Documentation of the biodiversity and introduction new ornamental and medicinal plants.
Course Code: BO 231	**SYBSc- Paper 1 Sem 1 Name of Course/paper - Taxonomy of Angiosperms and Plant Ecology**
CO1	To understand the basics of taxonomy and apply that information to identify plant specimens
CO2	With the help of basics, create the technology for storage of data and it's

	retrieval
Course Code: BO 232	**SYBSc- Paper 2 Sem 1 Name of Course/paper - Plant Physiology**
CO1	Students understood water and plant relationship, importance of water absorption, translocation, and transpiration.
CO2	Importance of various plant growth regulators in life of plants.
CO3	Students understood importance of Nitrogen in plants and how plant can obtain Nitrogen by various nitrogen fixation process, how it affects the yield of crop plants.
CO4	Importance of seed dormancy breaking methods and factors affect the germination and process will help student to break seed dormancy of some plants by using techniques learnt in this topic.
CO5	Importance of photo light effect and chilling effect important for flowering and fruit setting, techniques learnt in this chapter can be use for inducing flowering in some important crop or ornamental plants.
Course Code: BO 241	**SYBSc- Paper 1 Sem 2 Name of Course/paper - Plant Anatomy and Embryology**
CO1	Student should understand basics of Plant Anatomy and Embryology.
CO2	Knowledge of Plant Anatomy can useful in further research in Plant biochemistry.
CO3	Basics of Plant Embryology could be usefu in producing hybrids or cybrids, which is useful in Agriculture.
CO4	Identification of Plant specimen with the help of Anatomical features.
Course Code: BO 242	**SYBSc- Paper 2 Sem 2 Name of Course/paper - Plant Biotechnology**
CO1	Student can able to Produce amylase, proteases and lipase enzyme with the help of enzyme technology at laboratory level, Enzymes immobilization - concept and techniques of immobilization.
CO2	Citric acid production at laboratory level student can perform.
CO3	Student will able to produce of SCP from algae (Spirulina) and fungi (Yeast) and its economic importance.
CO4	Phytoremediation with the help of various methods can be achieved.
CO5	DNA isolation and its important in gene cloning.
Course Code: BO 243	**SYBSc - Practical Paper III**
CO1	Students classify and identify the flowering plant families on the basis of their morphological and floral characters.
CO2	Students are able to check Water Holding Capacity of Soil.
CO3	Students understand basics of *Spirulina* cultivation & fermentation and they able to make it as business opportunity.
Course Code: BO 331	**T.Y.B.Sc. Paper 1 Sem-3 Cryptogamic Botany**
CO1	The students get knowledge about the general characters, classification, and economic importance's of the lower and higher cryptogams.
CO2	The students get the detailed knowledge about the different examples from Algae, Fungi, Bryophytes and Pteridophytes with respect to

	taxonomic position, Morphology, anatomy, reproduction, gametophytes, sporophyte and economic importance.
CO3	Student can able to classify the plants on the basis of different Morphological, Anatomical and Reproductive characters.
CO4	The students can undertake the plant biodiversity survey projects.
Course Code: BO 332	**T.Y.B.Sc. 2 Sem-3- Name of Paper-Cell and Molecular biology**
CO1	Students learn details about plant cell and their function at molecular level
CO2	Students knows the importance of cellular and molecular techniques in plant science
Course Code: BO 333	**T.Y.B.Sc. 3 Sem-3- Name of Paper-Genetics and Evolution**
CO1	The ability to evaluate conclusions that are based on genetic data.
CO2	Have an enhanced knowledge and appreciation of evolutionary biology and behavior.
CO3	Analyze different Chromosomal Aberrations.
CO4	To evaluate direct & indirect evidences from fossil records, genetics & bio-geographical relations.
CO5	The study of concept of evolution helps to understand the different theories of evolution and the origin of life.
Course Code: BO 334	**T.Y.B.Sc. Paper 4 Sem-3- Name of Course/paper- Spermatophyta and Palaeobotany**
CO1	Student knows the economic importance of Gymnosperm.
CO2	Student Identify and classify Flowering plant families.
CO3	Learn the of conservation of plants and preparation of herbarium.
CO4	Evaluation of fossil plant for Phylogenic study.
CO5	Student knows the importance of Fossil plant/animals.
Course Code: BO 335	**T.Y.B.Sc. Paper 5 Sem-3- Horticulture and Floriculture**
CO1	Students can propagate the plants with vegetative and sexual methods of propagation.
CO2	Students know horticultural practical skills for vegetative propagation of plants through Cutting, Layering, Grafting and budding.
CO3	Students get the knowledge about the fruit and vegetable production technology such as Banana, Mango, Tomato, Peas, Beans and import and export potentiality of Horticultural crops.
CO4	Students can take the cultivation of Important floricultural crops like Aster, Gladiolus, Orchids, and *Tagetus*.
CO5	The students get the applied knowledge of different methods of drying of cut flowers and preservation techniques.
Course Code: BO 336	**T.Y.B.Sc. Paper 6 Sem-3- Name of Course/paper: Computational Botany**
CO1	Biostatistics play important role in medicine, Biology & public health.
CO2	It also analyses the data different plant species in different area.
CO3	To apply computational methods on data and get the result.

CO4	To analyze result obtained from computed data in a specific manner.
CO5	To apply technology for computation of collected data.
Course Code: BO.341	**T.Y.B.Sc. Paper 1 Sem 4 Name of Course/paper - Plant Physiology & Biochemistry**
CO1	Student knows the importance of photosynthesis and Respiration for the ecosystem.
CO2	Student learnt the effect of stress on crop plants.
CO3	Student identifies the role of enzyme in living system and its benefits.
CO4	Student described Role of secondary metabolites and human health.
Course Code: BO 342	**T.Y.B.Sc. Paper 2 Sem 4 Name of Course/paper- Plant Ecology and Biodiversity**
CO1	Students should attract and focused towards wild life Conservation and try to find out solutions on threats to nature at individual level first and later at scale level.
CO2	Students have opportunity to work on Environmental Impact Assessment projects and have jobs in Environmental Audit company & in Remote sensing department.
CO3	Students aware of importance of biodiversity and its conservation.
CO4	Students identify the various disciplines of biodiversity.
CO5	Students determine the best predictors of success for protected area in conserving biodiversity.
Course Code: 343	**T.Y.B.Sc.- Paper 3 Sem 4 Plant Pathology**
CO1	The course helps the students to know the basic concepts about the different terminologies about the plant pathology, introduction of plant pathology, economic importance of plant diseases.
CO2	The students can gain the information about the different stages in the disease development, disease forecasting, measurement of plant disease, and yield loss. The students get the detailed knowledge about the preexisting and induced structural and biochemical defense Mechanism.
CO3	Microscopic and Macroscopic study of the different plant diseases would be possible by using different culture techniques, media types, and preparation.
CO4	Students can identify different Fungal and bacterial diseases with respect to causal organism, symptoms, and control measures.
CO5	The students get the information about impact of non-parasitic diseases, abiotic causes of the non parasitic diseases, Principles of plant disease control with respect to biological, chemical, Effective Microorganism Solution (EMS) and Microbial pesticide, Study of Integrated Pest Management. Study of Molecular Diagnostics and Transgenic in crop Protection.
Course Code: BO 344	**T.Y.B.Sc. Paper 4 Sem 4 Name of Course/paper Medicinal and economic botany**
CO1	Students learn the indigenous system of medicine and its economic importance.
CO2	Students evaluate the drugs quality and drug adulteration.
CO3	Students learn the cultivation, collection and processing of herbal drugs

	and its industrial application.
CO4	Students learn the principles and scope of Ethno botany.
Course Code: BO 345	**T.Y.B.Sc. Paper 5 Sem 4 Name of Course/paper: Plant Biotechnology**
CO1	Students understood importance of crop improvement, and GMOs.
CO2	Study different breeding techniques like mutation breeding.
CO3	Students estimate the Genomic DNA content in plant tissues.
Course Code: BO 346	**T.Y.B.Sc. Paper 6 Sem 4 Name of Course/paper: Plant Breeding & Seed technology**
CO1	To provide scope ,objective of plant breeding & seed technology.
CO2	To learn the different method of plant selection.
CO3	To evaluate the mutation & types of mutation.
CO4	Understand different technique of seed processing.
CO5	To evaluate seed and learn the packaging & storage of the seed.

Course Outcomes of Microbiology Dept		
Class	**Subject**	**Learning Outcomes**
FYBSC fF	FYBSC SEM1 MB 111 PAPER I Introduction to Microbial World MB 112 II Basic Techniques in Microbiology MB113III Practical Course based on theory paper I and II SEM2 MB121I Bacterial Cell and Biochemistry MB122 II Microbial cultivation and growth MB123 III Practical Course based on theory paper I and II	Microbiology is a broad discipline of biology which encompasses five groups of microorganisms i.e. bacteria, protozoa, algae, fungi, viruses. It studies their interaction with theirenvironments as well as how these organisms are harnessed in human endeavour and their impact on society. The study has its extensions in various other conventional and advanced fields of biology by employing microbes as study models. Since inception of microbiology as a branch of science, it has remained an ever-expandingfield of active research, broadly categorized as pure and applied science. Microorganisms were discovered over three fifty years ago and it is thought that a huge diversity yet remains to be explored.Knowledge of different aspects of Microbiology has become crucial and indispensable to the society. Study of microbes has become an integral part of education and human progress. There is a continuous demand for microbiologists as work force –education, industry and research. Career opportunities for the graduate students are available in industry and research equally..
S.Y.B.SC.	Sem.-I Theory Paper-I Bacterial systematics and physiology	To study the microbial physiology with different instruments. To study bacterial physiology and different biochemical pathways. To study the enzyme and effect of environmental parameters.
	Sem.-I Theory Paper-II Industrial and soil microbiology	To study Industrial microbiology and soil microbiology.
	Sem.-II Theory Paper-I Bacterial Genetics	To understanding DNA,RNA,Replication,Expression,Mutations and Reversions. To study Plasmid Genetics.

	Sem.-II Theory Paper-II Air and Water Microbiology	To study the air microbiology. To study the water microbiology.
	Practical course based on Theory Papar-I and Theory Paper-II (Both Semisters)	To study Growth curve,Cell dimentions, Test of Potability of water. To study biochemical characterization and identification of bacteria. To study air flora and primary screening of industrially important microorganisms.
T.Y.B.Sc.	Sem.-III Theory Paper-I Medical Microbiology-I	To study the infectious diseases of different human systems. To study the epidemiology.
		To study the different bacterial pathogens.
	Sem.-III Theory Paper-II Genetics and Molecular Biology-I	To study gene linkage , crossover and DNA replication. To study the Transcription and Translation in Prokaryotes and Eukaryotes.
	Sem.-III Theory Paper-III Enzymology	To study enzyme, Assays and enzyme purification. To study enzyme kinetics, molecular regulation and Immobilization of enzymes .
	Sem.-III Theory Paper- IV Immunology-I	To study Immunity, Organs of Immune system, Innate Immunity, Antigen, Immunoglobulin. To study Adaptive Immunity and Transplantation and Immunity.
	Sem.-III Theory Paper-V Fermentation Technology-I	To study strain improvement, media optimization, sterilization of media. To study scale up and scale down and principles and methods of downstream processing. To study Quality assurance (QA) of fermentation product and fermentation economics.
	Sem.-III Theory Paper-VI Food and Dairy Microbiology	To study dairy development in India, milk chemistry and constituents and microbiology of milk To study preservation of milk by pasteurization and storage and microbial analysis of milk. To study classification of food based on stability, food spoilage and food preservation.
	Sem.-IV Theory Paper-I Medical Microbiology-II	To study chemotherapy . To study the different viral pathogens. To study the different parasites and fungal pathogens.

	Sem.-IV Theory Paper-II Genetics and Molecular Biology-I	To study Gene transfer by Transformation, transduction and conjugation. To study DNA Damage repair ,Recombination and Tools of recombination.
	Sem.-IV Theory Paper-III Metabolism	To study membrane transport, bioenergetics, biosynthesis and degradation. To study bacterial photosynthesis.
	Sem.-IV Theory Paper- IV Immunology-I	To study Major Histocompatibility complex, cytokines, antigen-antibody Interaction ,Immunohematology. To study Public health immunology, hypersensitivity.
	Sem.-IV Theory Paper-V Fermentation Technology-I	To study the solid state fermentation and submerged fermentation To study large scale production of primary and secondary
		metabolites, enzymes,,steroids,milk products, vaccines, immunesera and biomass based products.
	Sem.-IV Theory Paper-VI Agricultural and Environmental microbiology	To study the effect of microbes on agriculture and environment.
	Practical course –I Applied Microbiology	To study laboratory scale fermentation and tests for milk and dairy products. To study Isolation and identification of different plant pathogens , pesticide degraders lactic cultures. To study Quality assurance tests. To study biosynthesis of nanoparticles
	Practical course –II Biochemistry and Molecular biology	To study random sugar estimation and lipid profiling To study enzyme kinetics To study the protocols for plasmid isolation DNA isolation and transformation. To study bacteriophages.
	Practical course –III Diagnostic Microbiology and Immunology	To study immune hematology, agglutination test, immune precipitation and hemogram To study clinical microbiology To study how to prepare survey for epidemiology.

Mathematics Course Outcomes

SR.NO.	SUBJECT	LEARNING OUTCOMES
1.	Semester –I Paper I MT-111 Algebra Paper II MT-112 Calculus –I Paper III MT-113Mathematics Practical Semester –II MT-121 Analytical Geometry MT-122 Calculus – II MT-123 Mathematics Practical	1. Student will understand idea of permutation and combination. 2. Student will understand basic proof envolving sets and function. 3. Student will understand various type of tree and method for traversing tree. 4. Student will understand boolean algebra and truth table. 5. Student improve their logic
2.	(MTC-102)ALGEBRA AND CALCULUS	i. apply rule of limit to calculate limits. ii. student will understand find derivative of function. iii. student will understand the fundamental theorem to calculate evaluate definite integral and to differentiate function definite as a integral . iv. use the derivative to find tangent line to curves .
3.	(MTC-103) MATHEMATICS PRACTICAL COURSE	i. to better appreciate the variety of subjects m1 and m2. ii. the course intents to help the students think logically and critically about mathematical information. iii. we introduced to some exciting idea in mathematics that come from a wide variety to

		disciplines along with real world applications.
4.	(MTC-211) APPLIED ALGEBRA	i. present basic concept of matrices and matrix algebra . ii. present basic concept of vector space . iii. present concept of linear transformation . iv. present method of computing and using eigen value and eigen vector.
5.	(MTC-212) NUMERICAL ANALYSIS	i. develop appropriate numerical method to approximate the function . ii. develop appropriate numerical method to solve a differential equation. iii. derive appropriate numerical method to evaluate a derivative at a value. iv. performed an error analysis for various numerical method. v . student apply these methods in various field .
6.	(MTC-221) COMPUTATIONAL GEOMETRY	i. an introductory course to computational geometry and it's application. ii. we discuss techniques needed in designing and analyzing efficient algorithm for problem in geometry. iii. we develop idea geometric data structure e and motion planning. iv. student use these ideas in animation .
7.	(MTC-222) OPERATION RESEARCH	i. identify and developed operational research models from the verbal description of the real system. ii. understand the mathematical tools that are needed to solve optimization problem. iii. develop a report that describe the model and solving techniques. iv. student use these ideas in various managerial problem .
8.	(MTC-223) PRACTICLE	i. to solve mathematical problem by using c-programme. ii. represent geometrical diagrams using scilab. iii. student can solve any mathematical problems by using scilab and c programing . iv student can interact with mathematics and computer .
9.	STATISTICAL METHODS-I	i. the fundamental purpose of statistics is to identify out a sample, results that are valid for entire population. ii. descriptive statistics allow an easy introduction to the theory to the probability . iii. at a preliminary stage the sample should be

		simplified through it's representation in graphs and charts as precise as possible without loosing to much information iv. to devolved logic of the student. v student can handle statistical models .
10.	STATISTICAL METHODS-II	i. student will understand idea of permutation , combination and various counting . ii. to motivate the use of statistical inferences in practice data analysis . iii. to study elementary concepts and techniques in statistical methodology. iv. to provide a introduction to subsequent statics courses .
11.	STATISTICS PRACTICLE	i. the various design probabilities for a research project and the important consideration for observational studies and randomized thetrials ii. the types of the data generated in research studies . iii. particulars methods are appropriate and how to interpret their results. iv. the focus is mainly on interpretation and understanding appropriate methodology.