Solapur Zilla Samajseva Mandal's

SANTOSH BHIMRAO PATIL ARTS, COMMERCE AND SCIENCE COLLEGE, MANDRUP

Program Outcomes of the Arts Faculty (POs)

Name of the program	Program outcomes
B A	After the completion of three years of Bachelor in Arts (B.A.) program students will be able to: 1. understand how cultural historical, geographical, political, linguistic, and environmental forces shape the world and recognize the role of the individual within communities to effect change This includes the ability to : ✓ Reflect on one's cultural identities and values. ✓ Demonstrate intercultural awareness and competence. ✓ Recognize and appreciate the real world context knowledge. 2. promote active citizenship and community engagement, 3. do critical, creative thinking, 4. to understand and appreciate literature, and imbibe literary values, 5. develop intellectual independence, 6. demonstrate detailed knowledge in one or more disciplines and integrate knowledge and perspectives across disciplinary boundaries, 7. demonstrate personal integrity and professional behavior in scholarly endeavors and in collaborating with others within and beyond the academic community, 8. serve the society, nation, and the humanity working in various fields.

Program Specific Outcomes of the Arts Faculty (PSOs)

Name of the program	Program Specific Outcomes
B A in English	1. Formulation of knowledge of English language and literature. 2. Achievement of sound subject knowledge 3. Improvement in English Communication Skills 4. Ability to observe real life values through hliterary study 5. Inspiration of life through reading masterpieces of literature 6. Ability of enactment of literary works 7. Development of literary competence
B. A. in Geography	1. Capable geography graduates, with an aptitude for research, social service and leadership will have been produced. 2. Environment awareness will have been created through eco-friendly programs 3. The students will be able to establish Tourism information system. 4. The students will be able to work as a teacher in colleges, schools and high schools 5. The students will be able to work in disaster management and water resources management. 6. The students will be able to serve in forest department as forest conservator. 7. The students will be able to serve in cartographer in map making divisions of Government. 8. The students will be able to prepare for Competitive exams.
B. A. in History	1. The students will come to know aboutChh. Shivaji Maharaj and his times 2. The students will know India's freedom struggle and contribution of the freedom fighters in making of Modern India. 3. The students will take inspiration from historical persons and develop their personality.
B. A. in Marathi	१. सांस्कृतिक ओळख आणि मुल्यांची ओळख होईल. २. विद्यार्थ्यामधील क्षमता आणि जाणिवांचा विकास होईल. ३. जागतिक घडामोडींची ओळख होईल. ४. एक सक्रिय व जागरुक नागरिक होण्याच्या दृष्टिकोनातून मदत होईल. ५. मातृभाषेच्या विकासाच्या दृष्टीने विद्यार्थ्यांची मराठी भाषा सुधारेल. मराठी भाषेतून उत्तम प्रकारे संवाद साधण्यास त्यांना मदत होईल. ६. मृद्रित शोधन, सुत्रसंचालन, पत्रकारिता इत्यांदीच्या माध्यमातून विद्यार्थी व्यवसायिकतेच्या दृष्टिकोनातून परिपक्व होतील.

Course Outcomes of the Arts Faculty (COs)

Name of the Course	Course outcomes
B. A. - I **Sem. - I & Sem. -II** **Comp. English**	1. The students will be able to make use of formal communication in English 2. The vocabulary of the students will have increased 3. The students will be able to make use of various sentence structures 3.The students will be able to write formal letters 4. The language ability of the student will have been developed 5.The students will be able to understand the passage and grasp its meaning 6.The students will have acquired the basic language skills (listening, speaking, reading and writing)
B. A. - I **Sem. - I & Sem. –II** **Comp. Marathi**	१. मराठी साहित्यातील गद्य व पद्य प्रकारामुळे चिंतनशिलता व अनुभवसंपन्नता यात बदल झाल्याचा अनुभव आला.कवितेचे रसग्रहण कसे करावे व त्यातील आशय कसा समजावून घ्यावा हे लक्षात आले. २. महानुभाव संप्रदाय व संत संप्रदाय यांच्या विचारामुळे व्यक्तीचे आचरण कसे असावे हे कळले. ३.व्यवहारिक मराठीच्या अभ्यासामुळे मराठीत इंटरनेटचा वापर कसा करावा हे कळून आले.
B. A. - I **Sem. - I & Sem. -II** **Comp. STD**	1.The students will know about the development of science and technologyand contribution of some eminent scientists. 2. The students will have got acquainted with the dynamic aspects of development of science and technology. 3.The students will understand the scope and content of S.T.D. in relation to agriculture, transportation, pollution and communication etc. 4.The students will know about the importance of resources, human health and contribution of various scientific research institutes in India
B. A. – I **Democracy, Election and Good Governance**	1. Students enable to understand the meaning, definition, principles, dimensions and different types of democracy. 2. Students enable to understand the challenges before democracy 3. Students enable to understand the election procedure and provisions of election commission in Indian constitution, 4. Students enable to understand the national state and local body election 5. Students enable to understand the73 rd and 74 th constitutional amendment acts 6. Students enable to understand the duties and responsibilities of citizens in elections and electoral process. 7. Students enable to understand the meaning, dimensions and characteristic of good governance 8. Students enable to understand the deference between government,

	governance and good governance 9. Students enable to understand the constitutional provisions and good governance 10. Students enable to understand the challenges to achieve good governance and implementation of good governance
B. A. - I **Sem. - I & Sem. -II** **Opt. English,** **Paper I & II**	1.The students will understand the literary forms: poetry, short story, and one-act-play 2.The students will be able to analyze these literary forms 3.The students will know the important literary terms
B. A. - I **Sem. - I & Sem. -II** **Opt. Marathi,** **Paper I & II**	**मराठी नाटक नटसम्राट वि.वा.शिरवाडकर Sem-I** १. मराठी नाटकाचे प्रकार :- सुखात्मिका, शोकांन्तिका, प्रहसन, विनोदी अशा नाटयप्रकारांची ओळख झाली. २. या नाटकामध्ये बदलते जीवन पध्दतीमुळे पारंपारिक जीवन प्रणाली उध्वस्त होत आहे याची जाणीव होते. सुख आणि दु:ख हे जीवनाचा परिपाक आहे हे कळून येते. कलावंत असो अथवा बुध्दीमान असो असाहय जीवनप्रसंगी कोणी मदतीला येत नाही हे कठोर वास्तव प्रकट होताना दिसते. **मराठी कविता :- निवडक नारायण सुर्वे (संपादक कुसूमाग्रज) Sem.-II** नारायण सुर्वे यांची कविता हे कामगारांच्या, कष्टकरांच्या जीवनात समृध्द असे परिपूर्ण असे जगणे कधीच वाटयाला येत नाही. हे खेदाने कविना अधोरेखीत करावे लागते. यांच्या कवितेमुळे मराठी कवितेवर समाजवादी व मार्क्सवादी विचारांचा प्रभाव पडलेला दिसून येतो.
B. A. - I **Sem. - I & Sem. -II** **Opt. Hindi** **Paper I & II**	**प्रश्नपत्र क्रमांक I & II** १. छात्रों को भाषा तथा साहित्य की सार्थकता का ज्ञान प्राप्त होगा । २. छात्रों को हिंदी साहित्य की विविध गद्य विधाओं का परिचय प्राप्त होगा । ३. छात्रों में काव्य के रसग्रहण की क्षमता विकसित होगी । ४. छात्रों में संवाद कौशल्य विकसित होगा । ५. छात्रों को हिंदी साहित्य के लेखकों एवं कवियों का परिचय होगा । ६. छात्रों में राष्ट्र प्रेम एवं सामाजिक प्रतिबद्धता की भावना विकसित होगी ७. छात्रों का हिंदी भाषा के व्याकरण का ज्ञान विकसित होगा ।
B. A. - I **Sem. - I & Sem. -II** **Opt. History** **Paper I & II**	1. The students know the great work of Chh. Shivaji Maharaj 2. The students will be inspired by the study of life and work of Chh. Shivaji Maharaj
B. A. - I **Sem. - I & Sem. -II** **Opt. Economics** **Paper I & II**	1. The students will be able to understand the features of Indian Economy & Indian Population 2. The students will be able to understand the concept of Poverty & unemployment with its causes and measures. 3. The students will be able to understand the problem of rising prices. 4. The students will be able to understand the place of agricultural, causes of low agricultural productivity & need of second green revolution. 5. The students will be able to understand the role & classification of industry, small scale industry and new industrial policy. 6. The students will be able to understand the objective of Indian planning and NITI ayog with LPG & PURA model.

	7. The students will be able to understand the features of Maharashtra's economy, dry land farming, agro based industries and role of service sector also. 8. The students will be able to understand the role of various co-operatives e.g. sugar, Dairy & UCB's.
B. A. - I **Sem. - I & Sem. -II** **Opt. Geography**	1. The students will understand the effect of rotation of the Earth. 2. The students will understand interior structure of the earth 3. The students will understand the formation of Rocks 4. The students will understand the work of internal and external forces and their associated Landforms. 5. The students will understand the erosion and depositional land forms of Rivers and winds. 6. The students will understand the concept of Weathering. 7. The students will understand the application of geomorphology 8 The students will understand the importance of Atmosphere 9. The students will understand heat balance. 10. The students will understand the types of winds 11. The students will understand the structure, composition of Atmosphere. 12. The students will understand weather phenomena winds, humidity and precipitation.
B. A. - I **Sem. - I & Sem. -II** **Opt. Sociology** **Paper I & II**	1. The students will understand sociological concepts 2. The students will gain sociological knowledge. 3. Social understanding will have been created in students.
B.A. – I **Sem. - I & Sem. -II** **Opt. Political Science**	1. The students will understand the philosophy of Indian constitutions. 2. The students will be able to identify the causes, impact of British colonial rule. 3. The students will be able to appreciate the various phases of Indian national movement. 4. The students will be able to create value in young youth regarding the patriotism. 5. The students will be able to understand the various Government of Indian acts, their provision and reforms. 6. The students will be able to know the salient features in making of Indian constitution 7. The students will be able to appreciate the socio-economic political factors which lead to the freedom struggle. 8. The students will be able to appreciate the fundamental rights, duties and the directive principles of state policy

	9. The students will have got knowledge about legislation, executive and law making process in India 10. The students will have got information about and Judicial system in India 11. The students will know the Fundamental Rights and Duties of Indian citizens with a study of the significance and status of Directive Principles. 12. The students will acquired the knowledge about Indian federal system and its changing nature 13. The students will be able to evaluate the Electoral Process in India with focus on the Election Commission: Composition, Functions and Role 14. The students will be able to critically evaluate the Indian Party system – its development and looking at the ideology of dominant national parties 15. The students will be able to evaluate the role of various forces on Indian politics: religion; language; caste; tribe; regionalism; business; working class and peasants
B. A. - II **Sem. - III & Sem. -IV** **Comp. English**	1. The students will have acquired the language skills. 2. The students will be able to use some simple language expressions in day to day life. 3. The vocabulary of the students will have been developed 4. The communicative skills of the students will have been improved.
B. A. - II **Environmental Studies (Comp.)**	1. Students will have familiar with Environment. 2. They will know the importance and scope of sustainable development. 3. They will know function and types of ecosystem. 4. Students have understood the renewable and nonrenewable resources and their importance. 5. Students will have known the levels of biological diversity. 6. Students will have understood the environmental and its type. 7. They will know Environmental Policies & Practices. 8. They will become more active because of project report on the basis of field visit.
B. A. - II **Sem. - III & Sem. –IV** **HSRM (IDS)**	1. The students will have got a thorough knowledge of the radiation of Reforms in Maharashtra. To trace the books of Progressive thoughts in Maharashtra public life. 2. The students will know the key social reformers, their thoughts and acts and its impact in history of Maharashtra in specific and India in general.

B. A. - II **Sem. - III & Sem. -IV** **TG (IDS)**	1. The students will have got acquainted with basic concept of tourism geography. 2. The students will understand the factor affecting the tourism geography 3. The students will have got acquainted with basic concept of tourism development in India. 4. The students will have got familiar with geographical, historical, religious and cultural tourist places in India. 5. The students will be able to do the tourism planning.
B. A. - II **Sem. - III & Sem. -IV** **PA (IDS)**	1. The students will be able to demonstrate understanding of various activities of governmental administrators that fall under the rubric of public administration to include rule making and other regulatory activities, policy making and the delivery of services and programs 2. The students will be able to understand the 20th century emergence of the modern administrative state as a result of the technological, social, economic and political pressures that have emerged in national industrialized and developed complex, interdependent systems. 3. The students will be able to understanding of public administration as a career field in government. 4. Student will know the key dimensions of Indian Administration functioning at different levels. 5. Students will understand and analyze the administrative reforms introduced recently to make administration people-centric and to what extent that goal has been realized. 6. Students will understand Nature, Scope and importance of public administration and difference between public and private administration 7. The students will be able to understand the principles and units of organization 8. The students will be able to understand the characteristics, challenges of public corporations 9. The students will be able to understand the financial administration of India 10. The students will be able to understand the characteristics and models of public policy 11. The students will be able to understand the RTI, Lokpal and E-governance 12. The students will be able to understand the social welfare policies like Right to Education, National Health Programme, Right to food security and Employment Guarantee Scheme like MNREGA Programme

B. A. - II **Sem. - III & Sem. –IV** **Linguistics (IDS)**	1. The students will be able to understand the basic concepts of linguistics. 2. The students will be able to apply the knowledge of linguistics in day to day use of English.
B. A. - II **Sem. - III & Sem. -IV** **Opt. English, Paper III & V**	1. The students will know British Literature and writers. 2. The students will understand the process of literary and critical interpretation of the texts. 3. The students will know novel, essay, poetry and drama forms. 4. The students will know the historical background and literary characteristics of the texts.
B. A. - II **Sem. - III & Sem. -IV** **Opt. English, Paper IV & VI**	1. Thestudents will have got acquainted with different literary forms practiced in India in English language. 2. The students will have acquired reading skills of Indian Literature in English. 3. The students will have acquired critical and analytic skills of literary works. 4. The students will have got acquainted with the salient features of Indian English novel and drama.
B. A. - II **Sem. - III & Sem. -IV** **Opt. Marathi, Paper III & V**	**मराठी कविता - रानातल्या कविता (ना.धो.महानोर) Sem-III** १. मराठी कवितेची वाटचाल आणि ग्रामीण कवितेचे स्वरुप समजले. २. एकंदरीत अंतरंगातील व समाजमनातील प्रश्न कमी शब्दात मांडण्याचे माध्यम कविता आहे हे समजले. ३. या कवितेतून ग्रामीण जीवन कृषीसंस्कृती, निसर्गरचना, लोकधर्म अशा विविध जीवनांगाचे संदर्भ लक्षात आले. ४. कवीचा कवितानिमिर्तीचा हेतू लक्षात आला. काव्यास्वादाचे स्वरुप समजल्यामुळे कवितेतील भावासौंदर्य, रसग्रहण व काव्यशैली यांचा अभ्यास करता आला. **मराठी कथा-आपण माणसात जमा नाही. (राजन गवस) Sem-IV** १. मराठी कथासहित्याचा मागोवा घेता आला. २. मराठी कथेच्या माध्यमातून भाषा, लोकसंस्कृती, इतिहास इत्यादि तपशील लक्षात आला. ३. मराठी कथेच्या माध्यमातून मराठी बोलीची रुपे, विविध शब्द, मराठी भाषेवर झालेला इतर भाषेचा परिणाम हे कथेमुळे लक्षात आले. ४.राजन गवस यांच्या कथेतून आलेले संदर्भ यामुळे मानवी अंतर्मनात डोकावता आले. मनातील भावजीवन समजून घेता आले. सारांश लेखन संबंधी माहिती लक्षात आली.
B. A. - II **Sem. - III & Sem. -IV** **Opt. Marathi, Paper IV & VI**	**मराठी कादंबरी -शीतयुध्द सदानंद (श्याम मनोहर) Sem -III** १. मराठी कादंबरीचे स्वरूप व संकल्पना स्पष्ट झाली. मराठी कादंबरीची वाटचाल समजली. आशय व मध्यवर्ती कल्पना समजली. २. कादंबरीतील पात्रावर लेखकाच्या व्यक्तिमत्वाचा प्रभाव असल्याचे स्पष्ट झाले. ३. कादंबरीतील वातावरण हे वास्तवाभिमूख असल्याचे समजले. **४.** कार्यक्रमाचे सूत्रसंचालन कसे करावे याचे ज्ञान झाले. कार्यक्रमाची पूर्वतयारी कशी करावी, व सूत्रसंचालनासाठी कोणते गुण लागतात याची जाणीव झाली. **मराठी आत्मचरित्र - प्रकाशवाटा (डॉ. प्रकाश आमटे) Sem IV** १. आत्मचरित्राची व्याख्या, संकल्पना व प्रमुख घटक कोणते असतात हे लक्षात आले. २. मराठी आत्मचरित्राची परंपरा व विकास कसा झाला याची संपूर्ण माहिती झाली. ३. डॉ.प्रकाश आमटे यांचे जीवन आणि कार्य या मुळेच समजले. या बरोबर बाबा आमटे यांनी सूरू केलेला समाजसेवेचा वारसा डॉ. प्रकाश आमटे यांनी सूरू ठेवला. हे यांच्या कार्यातून लक्षात आले.

	४. व्यक्तीचित्रण म्हणजे काय व त्यातील घटक याअभ्यासामुळे लक्षात आले.
B. A. - II **Sem. - III & Sem. -IV** **Opt. Hindi, Paper III & V**	**मराठी कविता - रानातल्या कविता (ना.धो.महानोर) Sem-III** १. मराठी कवितेची वाटचाल आणि ग्रामीण कवितेचे स्वरुप समजले. २. एकंदरीत अंतरंगातील व समाजमनातील प्रश्न कमी शब्दात मांडण्याचे माध्यम कविता आहे हे समजले. ३. या कवितेतून ग्रामीण जीवन कृषीसंस्कृती, निसर्गरचना, लोकधर्म अशा विविध जीवनांगाचे संदर्भ लक्षात आले. ४. कवीचा कवितानिमिर्तीचा हेतू लक्षात आला. काव्यास्वादाचे स्वरुप समजल्यामुळे कवितेतील भावासौंदर्य, रसग्रहण व काव्यशैली यांचा अभ्यास करता आला. **मराठी कथा-आपण माणसात जमा नाही. (राजन गवस) Sem-IV** १. मराठी कथासहित्याचा मागोवा घेता आला. २. मराठी कथेच्या माध्यमातून भाषा, लोकसंस्कृती, इतिहास इत्यादि तपशील लक्षात आला. ३. मराठी कथेच्या माध्यमातून मराठी बोलीची रुपे, विविध शब्द, मराठी भाषेवर झालेला इतर भाषेचा परिणाम हे कथेमुळे लक्षात आले. ४.राजन गवस यांच्या कथेतून आलेले संदर्भ यामुळे मानवी अंतर्मनात डोकावता आले. मनातील भावजीवन समजून घेता आले. सारांश लेखन संबंधी माहिती लक्षात आली.
B. A. - II **Sem. - III & Sem. -IV** **Opt. Hindi, Paper IV & VI**	**प्रश्नपत्र क्रमांक IV** १. छात्रों को हिंदी साहित्य के भक्तिकाल तथा रीतिकालीन काव्य का परिचय प्राप्त होगा । २. छात्रों को भक्तिकालीन धार्मिक एवं सामाजिक परिवेश का ज्ञान मिलेगा ३. छात्रों को भक्तिकालीन निर्गुण एवं सगुण भक्तिधारा का ज्ञान प्राप्त होगा ४. छात्रों को रीतिकालीन श्रृंगार काव्य,वीर काव्य तथा नीतिकाव्य का ज्ञान प्राप्त होगा । ५. छात्रों में हिंदी भाषा एवं व्याकरण की समझ बढेगी । **प्रश्नपत्र क्रमांक VI** १. छात्रों को हिंदी साहित्य के आधुनिक काल की पृष्ठभूमि का ज्ञान प्राप्त होगा । २. हिंदी साहित्य के आधुनिक काल की छायावादी प्रकृति सौंदर्य से छात्र परिचित होंगे । ३. प्रगतिवाद के माध्यम से छात्रों में मानवी पीडा और सामाजिक संवेदना जागृत होगी । ४. छात्रों को स्वतंत्रता के पश्चात की सामाजिक एवं आर्थिक परिस्थिति का ज्ञान प्राप्त होगा । ५. छात्रों की व्याकरणिक आकलन की क्षमता बढेगी ।
B. A. - II **Sem. - III & Sem. -IV** **Opt. Geography, Paper III & V**	1. The students will understand the relationship of man and environment 2. Study of human evolution and races of man kinds. 3. The students will understand the concept of Determinism, Posibilism and Stop and Go determinism. 4. The students will understand the modes of life of Bhushmen, Gond, and Naga Tribes in world and in India. 5. The students will understand the Human race and culture. 6. The students will have got familiar with the nature &scope of Population Geography. 7. The students will understand growth and distribution of population. 8. The students will understand the history of population Growth. 9. The students will know the density of population. 10. The students will have got knowledge of population theories 11. The students will have got familiar with various government population policies.

	12. The students will know types, cause, and effects of migration.
B. A. - II Sem. - III & Sem. -IV Opt. Geography, Paper IV & VI	1. The students will have got familiar with Physiography, Rivers and Climate of India. 2. The students will understand Soil, and Vegetation 3. The students will have got familiar with Agriculture and Industries in India. 4. To acquaint the student with the Population, Transport and Trade of India. Resource of India
B. A. - II Sem. - III & Sem. -IV Opt. Sociology, Paper III & V	1. Sociological Perspective will have been created among the students about changing nature of Indian Society. 2. Awareness towards the dynamics of basic Social Institution will have been created among the students. 3. The students will come to know about the post globalization scenario in Indian Society.
B. A. - II Sem. - III & Sem. -IV Opt. Sociology, Paper IV & VI	1.Sociological understanding about Social Problems in India will have been created among the students. 2. The students will have got familiar with the nature of Indian Social Problems. 3. Awareness about Social Problems in India will have been created among the students.
B. A. - II Sem. - III & Sem. -IV Opt. History, Paper III & V	1. The students will know the history of Europe and so many revolutions happened In European countries.
B. A. - II Sem. - III & Sem. -IV Opt. History, Paper IV & VI	1. The students will know the freedom struggle of India and the contribution of revolutionaries.
B. A. - II Sem. - III & Sem. -IV Opt. Political Science, Paper III & V	1. The students will be able to understand the nature and scope of political theory. 2. The students will be able to understand the significance of political theory. 3. The students will have got acquainted with the theories, approaches, concepts and principles of political theory. 4. The students will know the meaning and types of Liberty, Equality and Justice 5. The students will know the meaning types and features of power, authority and legitimacy 6. The students will be able to understand difference between power, authority and legitimacy 7. The students will be able to understand meaning types and

	features of democracy.
B. A. - II **Sem. - III & Sem. -IV** **Opt. Political Science,** **Paper IV & VI**	1. The students will knowthe key ideas of political thinking in modern India as it shaped in the colonial context. 2. The students will be able to understand and decipher the diverse and often contesting ways in which ideas of nationalism, democracy and social transformation were discussed by leading Indian thinkers. 3. The students will be able to understand the difference between ideology and thought as well as between theory and ideology. 4. The students will be able to understand the relationship between ideas and politics. 5. The students will be able to understand the core doctrines of each of the ideologies and to make sense of politics through different ideological perspectives. 6. The students will knowpolitical thoughts of Raja Rammohan Roy, B.G.Tilak, Mahatma Gandhi and Jawaharlal Nehru 7. The students will knowthe contribution of political thinkers in independence movement and their 8. The students will know political thoughts of MaulanaAbulKalam Azad, M.N.Roy, Dr. B.R.Ambedkar and R.M. Lohiya
B. A. - II **Sem. - III & Sem. -IV** **Opt. Economics,** **Paper III & V**	1. The students will be able to understand the concept of money. 2. The students will be able to understand the concept of value of money. 3. Awareness will have been created among the students about recent trends in commercial banking inIndia. 4. The students will have got familiar with functioning of RBI and different monetary measures in India. 5. The students will be able to understand the nature and scope of public finance in India.
B. A. - II **Sem. - III & Sem. -IV** **Opt. Economics,** **Paper IV & VI**	1. The students will be able to understand the concept & importance of demography. 2. The students will be able to understand the mechanism, merits, and demerits of various sources of demographic data. 3. The students will be able to understand the basic theories of population. 4. The students will be able to apply the various techniques of analysis regarding population data. 5. The students will be able to understand the features & causes of growing Indian Population 6. The students will be able to understand the concept, types and causes of migration. 7. The students will be able to understand the evolution of Indian population policy, women empowerment.

	8. The students will be able to apply the knowledge of various growth rates, time series analysis & forecasting etc.
B. A. - III **Sem- V & Sem. -VI** **Comp. English,**	1. Students will be able to communicate fluently in English 2. Students will be able to express themselves in written English 3. Students will be able to prepare CV and job application letter 4. Students will have acquired basic vocabulary
B. A. - III **Sem. - V & Sem. -VI** **Spl. English,** **Paper VII & XII**	1. Students will be familiar with basic concepts of literary criticism. 2. They will have acquired knowledge of major trends in literary criticism. 3. Students will be able to appreciate literary text critically
B. A. - III **Sem. - V & Sem. -VI** **Spl. English,** **Paper VIII & XIII**	1. The students will have got acquainted with the major genres of British Literature. 2. The students will know various movements and major contribution to British literature. 3. Literary, linguistic and aesthetic competence of the students will have been enhanced.
B. A. - III **Sem. - V & Sem. -VI** **Spl. English,** **Paper IX & XIV**	1. Students will have deep understanding of different forms of literature. 2. Students will have learnt various themes, styles, genres as reflected in poetry drama and fiction prescribed for the syllabus.
B. A. - III **Sem. - V & Sem. -VI** **Spl. English,** **Paper X & XV**	1. The students will have clearly understood the key concepts of world literature. 2. The students will have been exposed to alternative literature produced in the world. 3. The students will have been provided an exposure to various forms of literature 4. The students will have got familiarwith the rich and complex literary tradition of the world 5. The students will have clearly understood the literary texts produced in different periods and cultures
B. A. - III **Sem. - V & Sem. -VI** **Spl. English,** **Paper XI & XVI**	1. The students will have understood various concepts in linguistics. 2. The students will have got acquainted with various branches of linguistics.
B. A. - III **Sem. - V & Sem. -VI** **Spl. Marathi,** **Paper VII & XII**	**साहित्यशास्त्र Sem.-V** १. साहित्य म्हणजे काय ? साहित्याची व्याख्या करता येईल काय? या प्रश्नाचा उलघडा झाला. साहित्य निर्मिती प्रक्रियेत प्रतिभा, अभ्यास, कल्पना आणि व्यासंग याला अधिक महत्त्व आहे समजून आले. २. साहित्य निर्मितीचा हेतू म्हणजेच साहित्य प्रयोजन होय, या संबंधीची माहिती झाली **(साहित्यशास्त्र) Sem-VI**

	१. शब्दशक्तीचा प्रकारासह ओळख झाली २. वाङ्.मय प्रकार कोणते? व कसे? हे समजले वद्यार्थ्यांचे सहित्याविषयाची आवड व गोडी निर्माण केली
B. A. - III Sem. - V & Sem. -VI Spl. Marathi, Paper VIII & XIII	**(भाषाविज्ञान व व्याकरण) Sem-V** १.मानवी जीवनात भाषेचे महत्त्व समजले. भाषेमुळे मानवी जीवनात विकास झाला. २.विद्यार्थ्यांना भाषाविषयक वैज्ञानिक दृष्टीकोन लक्षात आला. ३. ऐतिहासिक, वर्णत्माक व तुलनात्मक या भाषाभ्यास पध्दतीचा परिचय झाला. **(भाषाविज्ञान व व्याकरण) Sem-VI** १. कालानुरुप भाषा बदलते हे लक्षात आले. २. भाषा व व्याकरण यांचे परस्पर अनुबंध असतात हे अभ्यासामुळे लक्षात आले.
B. A. - III Sem. - V & Sem. -VI Spl. Marathi, Paper IX & XIV	**(मध्ययुगीन मराठी वाङ्.मयाचा इतिहास) Sem-V** १. मध्ययुगीन मराठी वाङ्.मयाचा इतिहास समाजवून घेतला. २. या कालखंडातील वाङ्.मयाचे स्वरुप व निर्मितीची प्रेरणा लक्षात आली. ३. या काळातील प्रमुख संप्रदाय व ग्रंथनिर्मितीचा अभ्यास झाला. **(मध्ययुगीन मराठी वाङ्.मयाचा इतिहास) Sem-VI** १.महाराष्ट्रात संताच्या कालखंडानंतर शाहिरांचा कालखंड सुरु झाला , त्यांची परंपरा त्यांच्या काव्यातील विविध विषयाची ओळख झाली. २. बखर वाङ्.मय या विषयाची सविस्तर माहिती मिळाली. त्या काळात होऊन गेलेले राजे-राजवाडे, युध्दनिती, यासबंधीची माहिती लक्षात आली. ३. या बरोबर इतर सांप्रदायांचाही अभ्यास झाला उदा.नाथ, दत्त, नागेश समर्थ, ख्रीस्ती, जैन आणि मुस्लीम
B. A. - III Sem. - V & Sem. -VI Spl. Marathi, Paper X & XV	**(उपयोजि मराठी) Sem-V** १. व्यवहारिक जीवनात भाषेचे महत्त्व लक्षात आले. २. काळाप्रमाणे भाषा आणि इतर भाषा उदा.बोली यांचा संबंध बदलत जातो हे लक्षात आले. ३. व्यवहारिक पातळीवर भाषेचे उपयोजन कसे करावे, यासंबंधीचे संपूर्ण ज्ञान झाले **(उपयोजित मराठी) Sem-VI** १. प्रसार माध्यमासाठी गरजेनुसार आवश्यक असणाऱ्या कथा, कविता, विडंबन, चारोळया तसेच ललित साहित्यातील लेखनांची कौशल्य समजावी लागतात त्याचे ज्ञान झाले. २. मुलाखतीचे स्वरुप समजले. मुलाखत घेतेवेळी कोणते प्रश्न विचारावे? व कोणते प्रश्न विचारु नये याविषयाची माहिती मिळाली. तसे ज्ञान झाले. निवेदकासाठी आवश्यक असणारे कौशल्य प्राप्त झाले.
B. A. - III Sem. - V & Sem. -VI Spl. Marathi, Paper XI & XVI	**(आधुनिक मराठी साहित्यातील विविध प्रवाह-ग्रामीण व दलित) Sem-V** १. आधुनिक काळात विविध साहित्यप्रवाह मराठी साहित्यात मिसळते. त्यांच्या निर्मितीची माहिती व त्यामागील प्रेरणा यांचा अभ्यास झाला. **२. बोलावे ते आम्ही श्रीकांत देशमुख .**या काव्यसंग्रहामुळे ग्रामीण कवितेची ओळख झाली. समाजजीवनही लक्षात आले. ३. महत्त्वाचे म्हणजे ग्रामीण बोलीभाषेचा परिचय झाला. **४. गुडदाणी - ले. योगिराज वाघमारे.** या कथासंग्रहामुळे दलित साहित्याचा जवळून परिचय झाला. कथेच्या अनुषंगाने दलित जाणिवांचा अनुभव आला. आणि आंबेडकरी विचारातून प्रेरणा घेऊन विकसीत झालेले हे साहित्य आहे याचा अभ्यास झाला. **(आधुनिक मराठी साहित्यातील विविध प्रवाह-स्त्रीवादी व मुस्लीम) Sem-IV** १. स्त्रीवादी व मुस्लीम साहित्याचे स्वरुप व वैशिष्टये समजली. २. स्त्रीवादी साहित्याची संकल्पना समजली **३. उत्खनन-गौरी देशपांडे** स्त्रीसाहित्याची प्रेरणा,गौरी देशपांडे यांच्या साहित्याचा परिचय झाला. या कादंबरीची आशयसूत्रे समजली. त्यातील स्त्रीजीवन, व्यक्तिरेखा यांचा अभ्यास झाला. **भोगले जे दु:ख त्याला - आशा आपराद** मुस्लीम मराठी आत्मचरित्राची संकल्पना वाटचाल समजली. आशा आपराद यांचे व्यक्तीगत जीवन जवळून अनुभवता आले. यामुळे सामाजिक जीवन, सांस्कृतिक जीवन व आत्मचरित्राची भाषा समजली.
B. A. - III Sem. - V & Sem. -VI	1.The students will know India's ancient history and Smdhu and Arya's culture at that time

Spl. History, **Paper VII & XII**	
B. A. - III **Sem. - V & Sem. -VI** **Spl. History,** **Paper VIII & XIII**	1. The students will know king of Mughal's history how they come to India and create a Mughal India.
B. A. - III **Sem. - V & Sem. -VI** **Spl. History,** **Paper IX & XIV**	1.The students will know Maratha Empire in the time of Bajirao I 2.The students will have understood the downfall of Maratha Empire at the time of Bajirao II
B. A. - III **Sem. - V & Sem. -VI** **Spl. History,** **Paper X & XV**	1.The students will have understood the first and second world war, its reasons and effects happened in the world
B. A. - III **Sem. - V & Sem. -VI** **Spl. History,** **Paper XI & XVI**	1. The students will have come to know the historical places and documents at that time.
B. A. - III **Sem. - V & Sem. -VI** **Spl. Geography,** **Paper VII & XII**	1. The students will have got acquainted with basic concepts of Economic Geography. 2. The students will know various types of Resources the basis for various economic activities. 3. The students will have got acquainted with various methods of conservation of resources. 4. The students will know the importance of energy resource. 5. The students will understand the mineral and power resources 6. The students will know types of agriculture, trade and transport. 7. The students will know the distribution of Iron and Steel, Automobile, Cotton Industries in India 8. The students will know the Weber theory of Industrial Location 9. Awareness will have been created among the students about need of conservation and Protection of natural resources. 10. The students will know Transport and Trade. 11. The students will understand the concept of Privatization, Globalization and Liberalization.
B. A. - III **Sem. - V & Sem. -VI** **Spl. Geography,** **Paper VIII & XIII**	1. Students will be familiarizing with the conceptual theoretical and empirical development in settlement studies in geography and current settlement scenario in the world and India. 2. To providing the students an idea about international & national

	concerns on settlement issues. 3. To Understanding the effect of urbanization in 21st century. 4. Making awareness to the students for importance of urban structure and rural and urban fringe. 5. Students will be study and importance of urban planning and urban development. 6. To understanding the basic concepts of political geography. 7. Students will be familiarizing with the geographical factors which have a bearing on the geopolitical administrative organization of space. 8. To enhance awareness of multidimensional nature of geo-political space. 9. Students will be understood about the boundaries and frontiers of nation 10. Students will be understood about changing the political map of India.
B. A. - III **Sem. - V & Sem. -VI** **Spl. Geography,** **Paper IX & XIV**	1. The students will know the Philosophical and Methodological foundation of the geography. 2. The students will know the major landmarks in development of geographical thought. 3. The students will have got familiar with Nature & Scope of Applied Geography. 4. The students will understand the various issues related to physical environment, human resources and economy etc.
B. A. - III **Sem. - V & Sem. -VI** **Geography Practical,** **Paper I & II**	1. The students will be able to use elements of map work. 2. The students will know weather instruments and weather charts. 3. The students will understand Measure Map Scales, conversion of scales 4. The students will understand types of projections 5. The students will be able to prepare various graphs and diagrams 6. The students will be able to use various cartographic Technique. 7. The students will understand the importance & basic principles of Remote Sensing. 8. The students will understand the importance of G.I.S. & G.P.S. techniques in geography.
B. A. - III **Sem. - V & Sem. -VI**	1. The students will know about Toposheets and its types 2. The students will understand the mechanism function of topographical maps.

Geography Practical, Paper III & IV	3. The students will understand indexing and interpretation of SOI toposheets. 3. The students will understand the statistical methods. 4. The students will understand method of representation of relief. 5. The students will have got acquainted with the Surveying 6. The students will know how to do Field Work. 7. The students will know about field survey and importance of tour in geography.

Program Outcomes of the Commerce Faculty (POs)

Name of the program	Program outcomes
B Com	1. After completing three years for Bachelors in Commerce (B.Com) program, students would gain a thorough grounding in the fundamentals of Accountancy. 2. The commerce and Accountancy focused curriculum offers a number of specializations and practical exposures which would equip the student to face the modern-day challenges in commerce and business. 3. The all-inclusive outlook of the course offer a number of value based and job oriented courses ensures that students are trained into up-to-date. In advanced accounting courses beyond the introductory level, affective development will also progress to the valuing and organization levels. 4. The primary goal of accounting education is to produce competent and ethical professional accountants capable of making a positive contribution over their lifetimes to the profession and society in which they work.

Program Specific Outcomes of the Commerce Faculty (PSOs)

Name of the program	Program outcomes
B Com	1. Students will be able to demonstrate progressive learning of various tax issues and tax forms related to individuals. Students will be able to demonstrate knowledge in setting up a computerized set of accounting books 2. Students will demonstrate progressive affective domain development of values, the role of accounting in society and business.

	3. Students will learn relevant financial accounting career skills, applying both quantitative and qualitative knowledge to their future careers in business. 4. Students will learn relevant managerial accounting career skills, applying both quantitative and qualitative knowledge to their future careers in business. 5. Learners will gain thorough systematic and subject skills within various disciplines of commerce, business, accounting, economics, finance, auditing and marketing. 6. Learners will be able to prove proficiency with the ability to engage in competitive exams like CA, CS, ICWA and other courses. 7. Learners will involve in various co-curricular activities to demonstrate relevancy of foundational and theoretical knowledge of their academic major and to gain practical exposure. 8: Learners can also acquire practical skills to work as tax consultant, audit assistant and other financial supporting services. 9. Learners will be able to do higher education and advance research in the field of commerce and finance.

Course Outcomes of the Commerce Faculty (COs)

Name of the Course	Course outcomes
B. Com. - I **Sem. - I & Sem. -II** **Comp. English**	1. The students will be able to make use of formal communication in English 2. The vocabulary of the students will have increased 3. The students will be able to make use of various sentence structures 3. The students will be able to write formal letters 4. The language ability of the student will have been developed 5. The students will be able to understand the passage and grasp its meaning 6. The students will have acquired the basic language skills (listening, speaking, reading and writing)
B.Com – I **Democracy, Election and Good Governance**	1. Students enable to understand the meaning, definition, principles, dimensions and different types of democracy. 2. Students enable to understand the challenges before democracy 3. Students enable to understand the election procedure and provisions of election commission in Indian constitution, 4. Students enable to understand the national state and local body election 5. Students enable to understand the73rd and 74th constitutional

	amendment acts 6. Students enable to understand the duties and responsibilities of citizens in elections and electoral process. 7. Students enable to understand the meaning, dimensions and characteristic of good governance 8. Students enable to understand the deference between government, governance and good governance 9. Students enable to understand the constitutional provisions and good governance 10. Students enable to understand the challenges to achieve good governance and implementation of good governance.
B.Com-I **Sem. - I & Sem. –II** **Financial Accounting**	1. The students will understand the conceptual framework of accounting. 2. The students will be able to construct a debit / credit transactions based on financial information. 3. The students will be able to prepare Accounts for various entities under different situations. 4. The students will understand and will be able to analyze utility of different financial statement.
B. Com. - I **Sem. - I & Sem. –II** **Principles of Business Management**	1. The students will understand the conceptual frame work of Management 2. The students will understand various management functions such as planning, organizing, directing, controlling and decision making. 3. Managerial skills will have been inculcated in students. 4. Awareness will be created among the students about working culture at different managerial level.
B. Com. - I **Sem. - I & Sem. –II** **Principles of Marketing**	1. To understand the different marketing concepts in global scenario. 2. To inculcate the effective marketing skills. 3. To understand role of different marketing mix. 4. To understand the role of Tele marketing in global scenario.
B. Com. - I **Sem. - I & Sem. –II** **Insurance**	1. The students will have acquired knowledge of fundamentals of insurance. 2. Awareness will be created among the students about procedural part in life insurance business and general insurance business 3. Consciousness will have been built among the students to become a life insurance agent. 4. The students will know recent trends in Insurance Sector.
B. Com. - I **Sem. - I & Sem. –II** **Business Economics**	1. The students will be able to apply the knowledge of market economy and price mechanism, demand elasticity,Indifferencecurve analysis and demand forecasting analysis in price fixing.

	2. The students will be well versed in the concepts, tools and principles in the field of business economics. 3.The students will be able to apply the knowledge of breakeven point analysis in their business
B. Com. - II **Sem. III & IV** **Comp. English**	1. The students will comprehend the language skills. 2. The students will be able to use some simple language expressions in day to day life. 3. The vocabulary of the students will have been developed. 4. The communicative skills of the students will have been improved.
B. Com. - II **Sem. III & IV** **Fundamentals of Entrepreneurship**	1. The students will understand the basic concept and acquire theoretical knowledge of entrepreneurship. 2. Entrepreneurial qualities and skills will have been developed among the students. 3. The students will have been motivated to become entrepreneur. 4. The base of various professional courses like C.A.,C.W.A..M.B.A., etc. and business will have been prepared.
B. Com. - II **Sem. III & IV** **Business Economics**	1) The students will understand the basic concepts and theories of Macro-Economic to the students. 2) The students will understand the Macro-Economic policies and create awareness about changes in various Macro-Economic theories to the students.
B.COM. II **Sem. III & IV** **Corporate Accounting**	1.The course enables the students to gain the Accounting standards issued by the Institute of chartered Accountants of India (ICAI) 2. The students' knowledge and skill about Issues of shares and Deb. And forfeiture of shares will be developed. 3. The students will have gained expert accounting knowledge and skills applicable to corporate Accounting in conformity with Indian companies Act 1956 and 2013. 4. The students' knowledge and skill about valuation of shares and Goodwill companies final Account and Liquidation will have been developed. 5. The students' knowledge about preparation of financial statement will have been enhanced.
B. Com. - II **Sem. III & IV** **Business statistics**	1. The students will have acquired knowledge of basic statistical concept. 2. An analytical approach towards statistical concept will have been inculcated among the students. 3 A base of various courses such as – C.A., MBA, & other

	competitive exams will have been prepared.
B. Com. - II Sem. - III & Sem. –IV Money & Financial System	1. The students will be able to apply the knowledge of the nature, functioning and issues related to money, banks and nonbank institution. 2. The students will be able to apply the knowledge of changing role o financial instructions in the process of growth and development. 3. The students will be able to apply the knowledge of recent technology in banking. 4. The students will be able to apply the knowledge of opening, operation & transfer of bank accounts.
B. Com. - II Environmental Studies	1. Students will have familiar with Environment. 2.They will know the importance and scope of sustainable development. 3. They will know function and types of ecosystem. 4. Students have understood the renewable and nonrenewable resources and their importance. 5. Students will have known the levels of biological diversity. 6. Students will have understood the environmental and its type. 7. They will know Environmental Policies & Practices. 8. They will become more active because of project report on the basis of field visit.
B. Com. - III Sem. V & VI Advanced Accountancy Paper – I	1. The students will have acquired the conceptual and practical knowledge of the Advanced Accountancy and to learn the techniques of preparing the financial statements. 2. The students will be able to understand and prepare bank final account. 3. The students will be able to enhance knowledge about various corporate actions internal reconstruction, hire purchase 4. The students will come to know other branches of accounting
B. Com – III Sem. V & VI Advanced Accountancy paper II	1. The students will know auditing principles, procedures of auditing. 2. The students will understand various Audits of various entities. 3. The base in calculating taxable income under various heads of incomes will have been created. 4. The students will understand the various rules regarding direct tax for relating Assessment year.
B.Com.-III Sem. V & VI Business Regulatory Framework	1. The students will have gained basic knowledge of law to commerce student. 2. Awareness about selected Business Laws will have been created among the students. 3. The students will know business regulatory framework in India.

B. Com. III **Sem. V & VI** **Modern Management Practices.**	1. The students will understand the student Recent trends in Management practices adopted by the business in the global competition. 2. Awareness about quality control techniques, International standards etc. will have been created among the students. 3. Awareness about career opportunities in BPO, Event mgt will have been created among the students. 4. Awareness about different modes of entering international business will have been created among the students. 5. Awareness about the Disaster mgt. and stress mgt will have been created among the students.
B. Com. – III **V & VI** **Cooperative Development**	1. The students will understand history of co-operative movement in world and India. 2. The students will understand the principles, and law relating to co-operative organizations in India. 3. The students will understand co-operative movement in Maharashtra. 4. The students will understand the working of various types of co-operative societies in India.
B. Com. – III **V & VI** **Business Economics**	1. The students will be able to understand the concept of growth & development. 2. The students will be able to understand the basic theories of economic growth & development. 3. The students will be able to understand the concept of human resource development, HDI, HPI & MPI 4. The students will be able to understand the problems of economic development. 5. The students will be able to understand the concept, features of Indian planning & NITI ayog. 6. The students will be able to understand the meaning, types, importance and problems of foreign capital. 7. The students will be able to understand the concept of new economic policy and related issues. 8. The students will be able to understand the objectives and role of international financial institutions.

Program Outcomes of the Science Faculty (POs)

Name of the program	Program outcomes
B. Sc.	After successful completion of three year degree program in physics a student should be able to 1. Demonstrate, solve and an understanding of major concepts in all disciplines of physics. 2. Solve the problem and also think methodically, independently and draw a logical conclusion. 3. Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of Physics experiments. 4. Create an awareness of the impact of Physics on the society, and development outside the scientific community. 5. To inculcate the scientific temperament in the students and outside the scientific community. 6. Use modern techniques, decent equipment. 7. develop scientific temper and thus can prove to be more beneficial for the society as the scientific developments can make a nation or society to grow at a rapid pace. 8. do some research for the welfare of mankind. 9. join as scientist and can even look for professional job oriented courses. 10. serve in Indian Army, Indian Navyand Indian Air Force as officers. 11. join Indian Civil Services as IAS, IFS etc. 22. serve in industries or may opt for establishing their own industrial unit. 23. serve in some reputed universities or colleges in India and abroad as well as in big MNC's. 24. work or get jobs in Marketing, Business & Other technical fields. 25. work as customer service executives. Students can also find employment in government sector. 26. demonstrate knowledge and understanding of the range of plant diversity in terms of structure, function and environmental relationships. 27. think logically and organize tasks into a structured form. 28. assimilate knowledge and ideas based on wide reading and

	through the internet. 29. understand the evolving state of knowledge in a rapidly developing field. 30. plan, conduct and write a report on an independent term project. 31. carry out practical work, in the field and in the laboratory, with minimal risk. They gain introductory experience in applying each of the following skills and gain greater proficiency in a selection of them depending on their choice of optional modules. 32**.** communicate scientific ideas in writing and orally. 33. to work as part of a team. 34. apply the knowledge of basic science, life sciences and fundamental process of plants to study and analyze any plant form. 35. identify the taxonomic position of plants, formulate the research literature, and analyze non reported plants with substantiated conclusions using first principles and methods of nomenclature and classification in Botany. 37. design solutions from medicinal plants for health problems, disorders and disease of human beings and estimate the phytochemical content of plants which meet the specified needs to appropriate consideration for the public health 38. conduct investigations of complex problems. 39. **c**reate, select, and apply appropriate techniques, resources, and modern instruments and equipments for Biochemical estimation, Molecular Biology, Biotechnology, Plant Tissue culture experiments, cellular and physiological activities of plants with an understanding of the application and limitations. 40. apply reasoning informed by the contextual knowledge to assess plant diversity, its importance for society, health, safety, legal and environmental issues and the consequent responsibilities relevant to the biodiversity conservation practice. 41. understand the impact of the plant diversity in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. 42. apply ethical principles and commit to environmental ethics and responsibilities and norms of the biodiversity conservation. 43. demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. 44. serve in graduate school, professional school and Sugar industry and the chemical industry like cement industries, agro product, Paint industries, Rubber industries, Petrochemical industries, Food processing industries, Fertilizer industries sectors.

	45. transfer and interpret knowledge entirely in the working environment.

Program Specific Outcomes of the Science Faculty (PSOs)

Name of the program	Program outcomes
B Sc. in Physics	After successful completion of three year degree program in physics a student should be able to 1. Understand the core concept of Physics through theory and practical. 2. Understand good laboratory practices and safety. 3. Make aware and handle the sophisticated instruments/equipment. 4. Acquire analytical and logical skill for higher education. 5. Excel in Experimental and Theoretical Physics. 6. Develop research oriented skills 7. Make aware and handle the sophisticatedinstruments/equipment. 8. Trained to take up jobs in allied fields. 9. Confident to take up competitive exams.
B Sc. in Chemistry	1. Gain the knowledge of Chemistry through theory and practical. 2. To explain nomenclature, stereochemistry, structures, reactivity and mechanism of the chemical reactions. 3. Identify chemical formulae and solve numerical problems. 4. Use modern chemical tools, Models, Chem-draw, Charts and Equipment. 5. Know structure-activity relationship. 6. Understand good laboratory practices and safety. 7. Develop research oriented skills. 8.make aware and handle the sophisticated instruments/equipment 9. To be able to acquire firm knowledge over fundamental theories, concepts of chemistry 10. To be able to develop analytical thinking and apply the same understanding and underlining principles, proposing mechanism. 11. Demonstrate, solve and an understanding of major concepts in all disciplines of chemistry. 12. Find out the green route for chemical reaction for sustainable 13. Create an awareness of the impact of chemistry on the environment,society, and development outside the scientific community. 14. Use modern techniques, decent equipment and Chemistry software.

	15. Employ critical thinking and the scientific knowledge to design, carryout, record and analyze the results of chemical reactions. PSO-16 Solve the problem and also think methodically, independently and draw a logical conclusion.
B Sc. in Botany	**1.** The student will be able to identify major groups of plants and compare the characteristics of lower (e.g. algae, fungi and Bryophyte) and higher (angiosperms and gymnosperms) plants. **2.** Students will be able to use the evidence based comparative botany approach to explain the evolution of organism and understand the genetic diversity on the earth. **3.** The students will be able to explain various plant processes and functions, metabolism, concepts of gene, genome and how organism's function is influenced at the cell, tissue and organ level. **4.** Students will be able to understand adaptation, development and behavior of different forms of life. **5.** The understanding of networked life on earth and tracing the energy pyramids through nutrient flow is expected from the students. **6.** Critically evaluation of ideas and arguments by collection relevant information about the plants, so as recognize the position of plant in the broad classification and phylogenetic level. **7.** Identify problems and independently propose solutions using creative approaches, acquired through interdisciplinary experiences, and a depth and breadth of knowledge/expertise in the field of Plant Identification. **8.** Accurately interpretation of collected information and use taxonomical information to evaluate and formulate a position of plant in taxonomy. **9.** Students will be able to apply the scientific method to questions in botany by formulating testable hypotheses, collecting data that address these hypotheses, and analyzing those data to assess the degree to which their scientific work supports their hypotheses. **10.** Students will be able to present scientific hypotheses and data both orally and in writing in the formats that are used by practicing scientists. **11.** Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works. **12.** Students will be able to apply fundamental mathematical tools (statistics, calculus) and physical principles (physics, chemistry) to the analysis of relevant biological situations. **13.** Students will be able to identify the major groups of organisms

	with an emphasis on plants and be able to classify them within a phylogenetic framework. Students will be able to compare and contrast the characteristics of plants, algae, and fungi that differentiate them from each other and from other forms of life. **14.** Students will be able to use the evidence of comparative biology to explain how the theory of evolution offers the only scientific explanation for the unity and diversity of life on earth. They will be able to use specific examples to explicate how descent with modification has shaped plant morphology, physiology, and life history. **15.** Students will be able to explain how Plants function at the level of the gene, genome, cell, tissue, Flower development. Drawing upon this knowledge, they will be able to give specific examples of the physiological adaptations, development, reproduction and mode of life cycle followed by different forms of plants. **16.** Students will be able to explain the ecological interconnectedness of life on earth by tracing energy and nutrient flow through the environment. They will be able to relate the physical features of the environment to the structure of populations, communities, and ecosystems. **17.** Students will be able to demonstrate proficiency in the experimental techniques and methods of analysis appropriate for their area of specialization within biology.

Course Outcomes of the Science Faculty (COs)

Name of the Course	Course outcomes
B. Sc. - I **Sem. - I & Sem. -II** **Comp. English**	1. The students will be able to make use of formal communication in English 2. The vocabulary of the students will have increased 3. The students will be able to make use of various sentence structures 3. The students will be able to write formal letters 4. The language ability of the student will have been developed 5. The students will be able to understand the passage and grasp its meaning 6. The students will have acquired the basic language skills (listening, speaking, reading and writing)
B. Sc. - III	1. Students will be able to communicate fluently in English 2. Students will be able to express themselves in written English

Sem. V & VI **Comp. English,**	3. Students will be able to prepare CV and job application letter 4. Students will have acquired basic vocabulary

Name of the Department - **Physics**

B.Sc.	
Name Of Subject: **Physics**	
SEM- **I**	
Course Number(Paper Number)-**I**	
Title of Course(Name of Paper)-**Mechanics and Properties of Matter**	
Course Content	Outcomes
Topic 1- Moment of Inertia	Student understood the important concept of moment of inertia. The students are able to calculate moment of inertia of various rigid bodies
Topic 2 – Pendulums	Students understood the working theory of compound pendulum. Students are successfully able to understand theory of various pendulums like bar pendulum, Katter's pendulum, Bifilar pendulum, torsional pendulum.
Topic 3 – Elasticity	Students understood the concept of elasticity. Students understood the relation between elastic constants. Students also studied the theory and experimental method to study poisons ratio.
Topic 4 – Surface Tension	Students understood the concept of surface tension. Students understood the relation between excess pressure and surface tension, excess pressure inside a liquid drop and soap bubble. Students understood the factors affecting surface tension and application of surface tension.
Topic 5 – Viscosity and Fluid dynamics	Students understood concept of viscosity and fluid dynamics. To understand energy possessed by liquid,Poiseuille's equation Bernoulli's theorem and its application.
B.Sc.	
Name Of Subject: **Physics**	
SEM- **I**	
Course Number(Paper Number)-**II**	
Title of Course(Name of Paper)-**Optics and Laser**	
Course Content	Outcomes
Topic 1 – Geometrical Optics and aberrations	The students understand Fermat's principle and aberration.
Topic 2 – Optical Instruments	The students get knowledge of type's construction and working of eye pieces spectrometer and optical bench.

Topic 3 – Interference	The students get knowledge of interference phenomenon in parallel faced wedge shaped thin film and Newton's rings experiment
Topic 4 – Diffraction	Students get knowledge of types of diffraction. Plane diffraction and its elementary theory its applications.
Topic 5 – Laser	The students get knowledge of laser basics construction and working of He-Ne and ruby laser

B.Sc.	
Name Of Subject: **Physics**	
SEM- **II**	
Course Number(Paper Number)-**III**	
Title of Course(Name of Paper)-**Heat and Thermodynamics**	
Course Content	**Outcomes**
Topic 1 –Transport Phenomenon	The students understand concept of transport phenomenon, its types, coefficient of viscosity and thermal conductivity.
Topic 2 - Liquefaction of Gases	The Students understand J-T effect and liquefaction of gases, adiabatic demagnetization and properties of liquid helium.
Topic 3 – Thermodynamics	The students gate knowledge of laws of thermodynamics, reversible and irreversible processes, isothermal and adiabatic process, adiabatic relations and entropy
Topic 4 – Heat Engines	The students understand Carnot's heat engine, Otto engine, diesel engine, efficiency and their comparison.
Topic 5 –Refrigerator	The students get knowledge of principal of refrigeration cycle, COP vapour.

B.Sc.	
Name Of Subject: **Physics**	
SEM- **II**	
Course Number(Paper Number)-**IV**	
Title of Course(Name of Paper)-**Electricity, Magnetism and Basic Electronics**	
Course Content	**Outcomes**
Topic 1 – Varying Current:	Student understood concept of wearing current students learn the growth and decay of current in LR circuit not studied charging and discharging of capacitor through registry in inductor
Topic 2 – A.C. Circuits:	Student learn application of complex number to study AC circuits student understood the concept of reactance prospectus impedance admittance and power factor of LCR circuit series and parallel resonance circuit resonance and quality factor of AC Bridge
Topic 3 –	Student understood the working principle of ballast galvanometer and

Magnetostatics and Ballistic Galvanometer:	where is constants invalid Galvanometer student study the concept magnetostatic and why salt law to determine magnetic induction at a point on the axis of current carrying coil of single turn and solenoid
Topic 4 – Electronic circuit components and Devices:	I don't understood classification of electronic circuit components as passive and active student understood bridge rectifier with filter Clippers clampers zener diode and its application as a voltage regulator
Topic 5 – Bi-Junction Transistor (BJT):	Student understood construction and working of transistor input output and transfer characteristics of CE and CB mode relation between alpha and beta transistor as amplifier

B.Sc.	
Name Of Subject: **Physics**	
SEM- **III**	
Course Number(Paper Number)-**V**	
Title of Course(Name of Paper)-**General Physics, Heat and Sound**	
Course Content	Outcomes
1. Vectors:	The students get knowledge of scalar and vector triple product, scalar and vector fields, del operator, gradient of scalar, divergence of a vector, curl of vector and their physical significance.
2. Precessional Motion:	The students understand precession and nutation, Lanchester's rules, gyroscope and its applications
3 . Elasticity:	Students get knowledge of elasticity bending moment cantilever and expression for Y and η of flat spiral spring
4. Viscosity:	The students get knowledge of viscosity, Searle's viscometer and Ostwald's viscometer.
5. Heat:	The students understand entropy physical significance of entropy, T-S diagram and entropy of a perfect gas and steam.
6. Sound:	The students get knowledge of transducer acoustic and it's affecting factors, reverberation time requirements of good acoustics, Sabine's formula and production, detection, properties and applications of ultrasonic.

B.Sc.	
Name Of Subject: **Physics**	
SEM- **III**	
Course Number(Paper Number)-**VI**	
Title of Course(Name of Paper)-**Electronics**	
Course Content	**Outcomes**

1.Transistor Amplifier	The students understand amplifier and modifications in amplifiers
2. Oscillator	The students understand oscillators and different types of oscillators
3.Unipolar Devices	The students understand FET and UJT with its construction and operation and application
4.Digital Electronics	The students understand digital electronics with different Gates with related adders and flip flops
5.Regulated Power Supply	The students studied different regulated power supply with IC voltage regulators.
6.Electronic Instruments	The students studied CRO and DMM

B.Sc.	
Name Of Subject: **Physics**	
SEM- **IV**	
Course Number(Paper Number)-**VII**	
Title of Course(Name of Paper)- **Optics**	
Course Content	**Outcomes**
1. Cardinal points:	Students studied Cardinal points, Newton's formula relation between focal lens for any optical system relation between lateral, axle and angular magnification, (introduction) combination of two thin lenses
2. Interference of light:	Students studied Michelson's interferometer and Fabry- Perot interferometer
3 . Diffraction of light:	Students studied Fresnel's half period zones, explanation of rectilinear propagation of light, zone plate, Fresnel's diffraction at straight edge
4. Resolving power:	Students studied resolving power geometrical and spectral resolution, distinction between magnification and resolution, Rayleigh criteria for the limit of resolution, modified Rayleigh's criteria resolving power of plane diffraction grating, resolving power of prism.
5. Polarization	Students studied polarization, double refraction hygiene's explanation of double refraction through uniaxial crystals because prism, phase retardation plates, elliptically and circularly polarized light, optical rotation, laws of rotation of plane of polarization, applications
6.Optical Fibers	Students studied structure and types of fibers numerical aperture pulse dispersion in step index fiber, fiber optic communication system advantages of optical fiber.
B.Sc.	
Name Of Subject: **Physics**	
SEM- **IV**	

Course Number(Paper Number)-**VIII**	
Title of Course(Name of Paper)- **Modern Physics**	
Course Content	**Outcomes**
1. Theory of relativity **2. Matter waves** **3. Vector Atom model** **4. Compton effect** **5. Nuclear Energy sources**	1. Analyze the effects of Relativity by Newtonian and Special Theory of Relativity 2. Understand the emergence of quantum concept 3. Student understood the de Broglie Wavelength of a wave associated with the particle and Heisenberg's Uncertainty Principle 4. Understood different atom models. 5. Student understood the Neutron induced nuclear reaction**,**Nuclear fission**,** Energy released in fission**,** Chain reaction (Atomic Bomb)**,** Nuclear reactor, Atomic energy in India.

B.Sc.	
Name Of Subject: **Physics**	
SEM- **V**	
Course Number(Paper Number)-**IX**	
Title of Course(Name of Paper)-**Mathematical Physics and Statistical Physics**	
Course Content	**Outcomes**
1. Vector Theorems and Introduction to Partial Differential Equation	Students understood Gauss theorem Green's theorem Stokes theorem students studied types of differential equation degree order, linearity, Homogeneity of differential equation .to understand concept of singular points of differential equation frobenius method of solving differential equation legendary differential equation Bessel differential equation hermite differential equation
2. Orthogonal Curvilinear Coordinates	Students understand concept of orthogonal co-ordinate system gradient in orthogonal co-ordinate system ,divergence in orthogonal co-ordinate system curl in orthogonal co-ordinate system laplacian operator in orthogonal co-ordinate system extension of orthogonal co-ordinate system in Cartesian spherical polar and cylindrical co-ordinate system
3. Basic Concept in Statistical Physics	Students understand Basic Concepts in Statistical Physics, Micro canonical and Canonical Ensemble Phase Space, Accessible microstates,A Priory Probability, Thermodynamic Probability, Probability Distribution, Entropy and probability.
4. Maxwell Boltzmann Statistics	Students understood concepts of Maxwell-Boltzmann Statistics, Evaluation of constants α and β, Molecular Speeds,Thermodynamic Functions in terms of Partition function.

5. Quantum statistics - I	Students understood basic concepts in Bose Einstein Statistics and Derive distribution law. To understand the black body radiation problem on the basis of Planck's Quantum theory. To derive the Rayleigh's Jeans Law, Wien's Displacement Law , Stefan's Law from Plank's radiation formula.
6. Quantum Statistics - II	Students understood Fermi Dirac Statistics Application to free Electrons in metals,Electron energy Distribution, Fermi Energy, Comparison of M.B., F.D. and B.E statistics.

Name of Department - **Physics**

B. Sc III	
Name Of Subject: **Physics**	
SEM- **V**	
Course Number(Paper Number)-**X**	
Title of Course(Name of Paper)- **Solid State Physics**	
Course Content	**Outcomes**
1. Crystallography:	To understood the concept of crystallography.
2. X- ray Diffraction by Crystals:	To understood the X-ray diffraction and methods.
3. Free electron Theory:	To understood the free electron concept.
4. Band theory of solids: (08)	To understood and Analyze the success and failure of free electron theory, the origin of band gap and Hall effect
5. Magnetic materials:	To understood the distinguish between different types of magnetic materials
6. Superconductivity:	To understood the superconductors and types of superconductors.

B. Sc.	
Name Of Subject: **Physics**	
SEM- **V**	
Course Number(Paper Number)-**XI**	
Title of Course(Name of Paper)-**Classical Mechanics**	
Course Content	Outcomes
1. Mechanics of a particle and system of particles:	The students understand Mechanics of a particle and system of particles, Conservation laws and Applications.
2. Lagrangian Formulation:	The students get knowledge of Constraints, Degrees of freedom, Generalized coordinates, Principle of virtual work, D'Alembert's Principle and Lagrangian Formulation and Applications of Lagrange's

	equation.
3. Moving Coordinate systems:	The students get knowledge of Moving Coordinate systems, Coriolis force, Foucault's pendulum, Effects of Coriolis force in nature and freely falling body
4. Techniques of Calculus of Variation:	The students get knowledge of Hamilton's principle, its derivation from Lagrange's equations and applications of Hamilton's principle.
5. Coupled Oscillations:	The students get knowledge of coupled oscillatory system, Normal modes and normal coordinates, energy and energy transfer coupled Oscillatory system.
6. Motion of rigid body:	The students get knowledge of motion of rigid body in space Euler's theorem angular momentum and energy Euler's equation of motion

B. Sc.	
Name Of Subject: **Physics**	
SEM- **V**	
Course Number(Paper Number)-**XII**	
Title of Course(Name of Paper)-**Nuclear Physics**	
Course Content	Outcomes
1. Nuclear structure and properties	Students studied Nuclearstructure and propertiesincluded Composition ofnucleus ,Nuclear radius, Nuclear spin, Nuclearmagnetic moment Electric quodrupolemoment, Mass defect, Binding energy, Packingfraction, Liquid dropmodel of nucleus, Semi-empirical mass formula.
2. Nuclear reactions	Students studied Nuclearreactions includeQ value of nuclearreactions, Thresholdenergy. Cross section ofnuclear reactions(qualitative),Strippingreactions, Pick-upreactions.
3. Particle Accelerators:	Students studied ParticleAccelerators such as Cyclotron,With the Limitations ofcyclotron, Phase stable orbit and betatron.
4. Nuclear radiation detectors	Students studied NuclearRadiation Detectors suchas Geiger Muller Counter, Wilson Cloudchamber and Scintillationcounter.
5. Nuclear Energy Levels	Students studied NuclearEnergy Levels with αparticle spectra, Nuclear Energy levels, β- decay, Experimental study of β-decay, Continuous β-ray spectrum, Pauli'sNeutrino Hypothesis,Nuclear Energy Levelsfrom β- decay.
6. Elementary particles	Students studied elementaryPartials with Types ofinteractions, Classificationof elementary particles,Properties of particlesIntroduction of quarks.

B.Sc. III	
Name Of Subject: **Physics**	
SEM- **VI**	
Course Number(Paper Number)-**XIII**	
Title of Course(Name of Paper)-**Electrodynamics**	
Course Content	**Outcomes**
1. Electrostatics and Charged particle dynamics:	To understood the basic concepts of electrostatics, Study the unification of electric and magnetic phenomena
2. Time varying fields	Demonstrate magnetic field of electric current/ electromagnetic induction through proper understanding
3. Maxwell's equations.	To gain knowledge about Maxwell's equations and EM waves
4. Electromagnetic waves.	To gain knowledge about Maxwell's equations and EM waves
5. Reflection and Refraction of E. M. waves:	To understood the reflection refraction of E.M. waves
6. Radiation from electric dipole:	To understood the radiation electric dipole moment.

B.Sc.	
Name Of Subject: **Physics**	
SEM- **VI**	
Course Number(Paper Number)-**XIV**	
Title of Course(Name of Paper)-**Materials Sciences**	
Course Content	**Outcomes**
1. Materials and their properties:	The student understand Classification of materials and their Mechanical, Thermal properties, Optical properties, Electrical properties, Magnetic Properties.
2. Polymer materials:	The students understand Polymerization mechanism, their types, degreeand defects in polymerization, applications and properties of polymers.
3. Ceramic Materials:	The students get knowledge of Classification of ceramic materials, their Structure, processing, Properties and Applications.
4. Composite Materials:	The students get knowledge of Fabrication of composites, their properties and applications
5. Biomaterials:	The studentsget knowledge of Classification of Biomaterials, their processing, properties and Applications.

6. Nanomaterials:	The students get knowledge of history, Classification, Significance, Methods of synthesis, Bottom-up and Top-down approaches of Nanomaterial's. Physical, chemical and hybrid methods of nanomaterial's synthesis.

B.Sc.	
Name Of Subject: **Physics**	
SEM- **VI**	
Course Number(Paper Number)-X**V**	
Title of Course(Name of Paper)-**Atomic, Molecular Physics And Quantum Physics**	
Course Content	**Outcomes**
1. Atomic Spectra	The students get knowledge of Spectral notations, Alkali spectra, Doublet fine structure of alkali metals, Spectrum of Sodium, Selection rules, Intensity rules
2. Effects of Magnetic and Electric fields on Atomic Spectra	The students understand the Effects of Magnetic and Electric fields on Atomic Spectra from Anomalous Zeeman effect, Paschen Back effect and stark effect.
3. Molecular Spectra and Raman	The students get knowledge of Molecular bond, Rotational spectra, Vibrational spectra, Vibration-Rotation spectra, Electronic spectra, Franck-Condon principleand Raman effect.
4. Quantum Mechanics	The students understand Heisenberg's uncertainty principle, Physical significance of ψ, to derive Time dependent and time independent Schrödinger wave equations, Eigen values and Eigen functions and Probability current density
5. Application of Schrodinger's time independent wave equation	To students can apply Schrodinger's time independent wave equation to Particle in a Box, Step Potential, Potential Barrier, Potential Well, Harmonics Oscillator and Zero point Energy.
6. Operators	The students get knowledge of Operators in quantum mechanics their types, Commutation properties. Also Schrodinger's equation or hydrogen atom and Separation of radial and angular parts.

B.Sc.	
Name Of Subject: **Physics**	
SEM- **VI**	
Course Number(Paper Number)-X**VI**	
Title of Course(Name of Paper)-**Electronics**	
Course Content	**Outcomes**
1. Operational Amplifier:	To study the Operational Amplifier and their types.
2. Timer:	To know the Timer IC- 555 and its classification
3. Silicon Controlled Rectifier (SCR).	To Understand the SCR

4. Diac and Triac	TO Understand Diac and Triac
5. Display Devices	To Understand the Display Devices.
6. Field Effect Transistor	To understand the FET, JFET,MOSFET.

Name of Department **- Mathematics**

B.Sc. –I	
Name Of Subject: - **Mathematics**	
SEM- **I**	
Course Number(Paper Number)-**I**	
Title of Course(Name of Paper)- **Algebra**	
Course Content	**Outcomes**
Matrices:- Symmetric and Skew symmetric, Elementary transformations, Rank of a Matrix(Echelon and Normal form), Characteristic equation of a matrix, Cayley Hamilton theorem and its use in finding the inverse of a matrix.	The students are able to use techniques for solving matrices
Linear Equations:- Application of matrices to a system of linear (both Homogeneous and non-homogeneous) equations, Eigen values and Eigen vectors.	The students are able to use matrix techniques for solving system of linear equations eigenvalues and eigenvectors
Complex Number:- Modulus and Argument of a Complex Number, DeMoivre's Theorem and its applications, Roots of Unity, Roots of Complex Numbers.	The students are able to use techniques for solving complex roots of unity
Transcendental Functions:-Circular Functions and their inverses and Hyperbolic Function of a complex variable with their inverses.	The student can understood the transcendental functions

B.Sc- I	
Name Of Subject: - **Mathematics**	
SEM- **I**	
Course Number(Paper Number)-**II**	
Title of Course(Name of Paper)- **Calculus**	
Course Content	**Outcomes**
Differentiation: Indeterminate forms and L' Hospital's Rule, Successive	The students can express the

Differentiation, Derivatives of standard functions, Leibnitz rule. Taylor's theorem and Maclaurin's Theorem (Only Statements). Series expansions of cos x, sin x, (1 + x) log(1+x).	power series expansion of a given function and evaluate the limits
Function of two variables:- Limit and Continuity of function of two variables, Partial derivative, partial derivative of higher orders, Homogeneous functions, Euler'sTheorem on Homogeneous functions.	The students will able to solve limits partial derivatives of functions of two variables
Reduction Formulae:- $\int_0^{\frac{\pi}{2}} sinnx$, $\int_0^{\frac{\pi}{2}} cosnx$,$\int_0^{\frac{\pi}{2}} sinnxcosnx$ (Note that reduction to these forms are not expected)	The students are able to use techniques for solving integration of sine and cosine
Vector Calculus:- Scalar point function, Vector point function,Directional derivatives, divergence and Curl and its properties.	The students will able to use differential vector and differential operator

B.Sc.-**I**	
Name Of Subject: - **Mathematics**	
SEM- **II**	
Course Number(Paper Number)-**III**	
Title of Course(Name of Paper)-**Geometry**	
Course Content	**Outcomes**
Change of Axis:- Translations, Rotations, Invariants, and Identifications of conics From General form of second degree equations, Polar Coordinates, Conversion formulae.	The student will understood the change of axis
Sphere:- Centre radius form, General form, Diameter form, Equation of Tangent Plane and condition for tangency, Family of spheres S+λ__=0, S+λP=0.	The student will understood the sphere
Plane:- General equation of plane, Normal equation, Intercept form Angle between two planes, Plane through three points, Plane through a given point, Sides of a Plane, Distance of a point from a plane, Family of planes.	The student will understood the plane

B.Sc.-**I**	
Name Of Subject: - **Mathematics**	
SEM- **II**	
Course Number(Paper Number)-**IV**	
Title of Course(Name of Paper)-**Differential Equation**	
Course Content	**Outcomes**
Differential Equations of first order and first degree :- Variables separable, Homogeneous, non- homogeneous differential Equations.	The students will able to solve of first order and first degree equations
Differential Equations of first order and first degree:- Exact differential equations. Necessary and sufficient condition for exactness, IntegratingFactor with four	The students will able to solve a first order and first degree equations

rules, Linear differential equations of the form: dy/dx+py=Q; Bernoulli's Equation dy/dx+Py=Qyn.	
Linear Differential Equations With ConstantCoefficients :- Complementary function and particular integral, General solution of f(D) y=X, Solution off (D)y=0 for non-repeated , repeated, real and complex root.	The students will able to use techniques for solving linear differential equation with constant coefficients
Linear Differential Equations With Constant Coefficients :- Solution of f(D)y=X , where X is of the form eax, sin(ax), cos(ax), xm, eaxV, xV	The students will able to use techniques for solving linear differential equation with constant coefficients (C.F+P.I)

B.Sc. –**II**	
Name Of Subject: - **Mathematics**	
SEM- **III**	
Course Number(Paper Number)-**V**	
Title of Course(Name of Paper)- **Differential Calculus**	
Course Content	**Outcomes**
Curvature :- Definition of Curvature ,Length of arc as a function, Radius of curvature, Cartesian Equation, Parametric Equations, Polar Equations, Pedal Equations.	Students can understood application of curvature
Jacobians:- Definition of a Jacobian, Jacobian of a function of function, Jacobian of implicit function,Condition of dependent functions (statement only).	Students can understood applications of Jacobian
Maxima and Minima :- Definition of Maximum value and minimum value of a function of one, two variables, Necessary condition for extreme values(Statements only), sufficient condition for extreme values (Statements only), Use of second order derivatives. Maxima and Minima of a function of two variables, Lagrange's Method of undetermined multipliers of two variables.	Students can understood how find maximum and minimum value of the function
Tangents and Normal:- Equations of tangents and Normal, Angle of intersection of two curves, Length of tangent, normal, sub tangent, subnormal at any point of a curve, Pedal equations or p, r equations (Cartesian form), Angle between radius vector and tangent, Length of the perpendicular from pole to the tangent, Length of polar sub tangent	Students can understood how to find area between arc and angle of intersection of two curves

and polar sub-normal, Pedal equations (polar form), Derivative of length of an arc(Cartesian form), Derivative of arc length(Polar Formula) and Other formulae.	

B.Sc. –**II**	
Name Of Subject: - **Mathematics**	
SEM- **III**	
Course Number(Paper Number)-**VI**	
Title of Course(Name of Paper)- **Real Analysis**	
Course Content	**Outcomes**
Real Numbers :- 1. Introduction 2.Field Structure and Order Structure 3. Bounded and Unbounded Sets: Supremum, Infimum 4 Completeness in the Set of Real Numbers 5. Absolute Value of a Real Number	Student can understood set theory and real number
Real Sequences :- 1. Sequences 2. Limit Points of a Sequence 3. Limit Inferior and Superior 4. Convergent Sequnces 5. Nonconvergent Sequences(Definitions) 6. Cauchy's General Principle of Convergence 7. Algebra of Sequences 8. Some Important Theorems 9. Monotonic Sequences	Students can understood real sequence and how to show the sequence is convergent or divergent
Infinite Series :- 1. Introduction 2. Positive Term Series 3. Comparison Tests for Positive Term Series 4. Cauchy's Root Test 5. D'Alembert's Ratio Test 6. Raabe's Test (without proof and Examples) 7. Logarithmic Test (without proof and Examples)	Student can understood infinite series and how to check the series is convergent or divergent

B.Sc.-**II**
Name Of Subject: - **Mathematics**
SEM- **IV**

Course Number(Paper Number)-**VII**	
Title of Course(Name of Paper)-**Differential Equations**	
Course Content	**Outcomes**
Differential Equations of the first order and of degree higher than the first :- Equations that can be resolved into factors of the first degree, Equations solvable for equations solvable for y, Claimant's equation, Equations reducible to clairaut's form.	Students can understood what is the differential equation and how to get a solution of differential equation
Linear Equations of the second order :- General form of the second order linear equation, Complete solution when one integral belonging to complementary function is known, Rules of getting an integral belonging to complementary function, Removal of the First order Derivative.	Student can understood what is linear equation of second order and how to get solution of linear equation
Linear Equations of the second order & Homogeneous linear equations :- Transformation of the linear equation of second order by Changing the independent variable, Homogeneous linear equations, Working rule for finding the solution, Equations reducible to Homogeneous form.	Students can understood what is homogeneous linear equation of second order and how to get a solution of homogeneous linear equation
Simultaneous Equations & Total Differential Equations: Nature of the solution of simultaneous equations, Rules of solving the Equation, Total Differential Equation, Necessary and sufficient condition for the inerrability of total differential equation (proof of Necessity only), Condition for exactness, Criterion for exactness , Method of Solving the Equation.	Students can understood simultaneous equations and Total Differential Equation and nature of solution of simultaneous equations and method of solving the equation

B.Sc-**II**	
Name Of Subject: - **Mathematics**	
SEM- **IV**	
Course Number(Paper Number)-**VIII**	
Title of Course(Name of Paper)-**Abstract Algebra**	
Course Content	**Outcomes**
Introduction to Groups :- Definition and Example of Groups, Permutations, Subgroups, Groups and Symmetry.	Students can understood group and examples
Equivalence, Congruence, Divisibility :- Equivalence relation and partitions, Congruence and Division Algorithm, Integer Modulon, Greatest Common Divisors, The Euclidean Algorithm, Factorization, Euler's PhiFunction.	Students can understood equivalence congruence divisibility and examples
Groups :- Elementary Properties of Groups, Generators, Direct products, Cosets, Lagrange's Theorem, Isomorphism, More on Isomorphism, Cayley's Theorem.	Students can understood properties of group and some theorems on groups
Group Homomorphism :- Homomorphism of Groups, Kernels, Quotient Groups, The Fundamental theorem of Homomorphism.	Students can understood group homomorphism and examples

Name of the Department**: Botany**

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- I (Semester- I)	
Name of the Subject: BOTANY	
Paper number: I	
Name of the paper: Microbiology and Phycology	
Course content	**Outcomes**
Unit 1: Introduction of Microbiology	The student can understand the basic concept of microbiology.
Unit 2: Microbes	The student can understand in detail about the viruses, diversity of bacteria and about the Mycoplasma.
Unit 3: Phycology	The student can understand importance of algae.
Unit 4: Cyanophyta	The student can understand in detail about the division Cyanophyta along with itsone detailed example of Nostoc
Unit 5:	The student can understand in detail about the division chlorophyta

Chlorophyta	along with its one detailed example of Spirogyra
Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- I (Semester- I)	
Name of the Subject: BOTANY	
Paper number: II	
Name of the paper: Fungi and Archegoniate	
Course content	**Outcomes**
Unit 1: Fungi	The student can understand about the general introduction of true fungi.
Zygomycotina	The student can understand about division of Zygomycotina.
Ascomycotena	The student can understand about the division of Ascomycotina.
Unit 2: Archegoniate	The student gets a detailed idea about Archegoniate.
Unit 3: Bryophytes	The student can understand about the Bryophytes and life cycle of Riccia with its economic importance.
Unit 4: Pteridophyta	The student can understand about the Pteridophytes and life cycle of Selaginella with its economic importance.
Unit 5: Gymnosperms	The student can understand about the Gymnosperms and life cycle of Cycas with its economic importance.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- I (Semester- II)	
Name of the Subject: BOTANY	
Paper number: III	
Name of the paper: Plant Ecology	
Course content	**Outcomes**
Unit 1: Introduction	The student can understand about the Climatic and Edaphic factors of environment.
Unit 2: Ecological adaptations	The student can understand about the Ecological adaptations in plants.
Unit 3: Plant communities	The student can understand about the Plant communities.
Unit 4: Ecology	The student can understand about the concepts of ecology.
Unit 5:	The student can understand about the Ecological succession.

Ecological succession	

Department of Chemistry

Name of the Course	Course Outcomes
B. Sc-I, Semester-I **Physical Chemistry**	After completion of these courses students should be able to: 1. To apply gas laws in various real life situations. 2 To explain the behavior of real and ideal gas 3. To differentiate between gaseous state and vapour. 4 To explain the kinetic theory of gases. 5.Explain the Mathematical Concept, 6. To explain the order of reaction 7. Explain the Spontaneous and Non-spontaneous reaction 8. Explain the rate of reaction which is related with concentration, temp.
Inorganic Chemistry	1. Know the discovery of electron, proton and neutron and their characteristics. 2. To understand the periodic properties such as Electronegativity, Electron affinity, Ionisation Potential. 3To understand the periodic law and significance of atomic no and electronic configuration as the basic for periodic classification. 4 To classify elements into s,p,d and f blocks and learn their main characteristics. 5To understand the concept Ionic solids and Crystal structure of various ionic solids 6. To recognize the type of chemical bonds. 7 To describe the Concept of Hybridisation with Inorganic Molecules 8 To understand the VSEPR theory with suitable examples. 9.To explain the MOT With suitable examples
B. Sc-I, Semester-II **Organic Chemistry**	1. Explain hybridization with organic compounds i.e. methane, ethylene,acetylene. 2. Discuss resonance, hyper conjugation, and inductive, steric effect with suitable example. 3. Explain fundamental organic reaction mechanism. 4. Discuss curved arrow notation, half headed, double headed arrow with suitable example. 5. Explain types of bond fission reaction. 6. Define reagent and explain different types of reagents used in organic chemistry. 7. Discuss different types of organic reactions.

		8. Define reactive intermediates and briefly discuss different types of reactive intermediates in organic reaction. 9. Distinguish between geometrical and optical isomerism. 10. Define optical activity and discuss optical isomerism of optically active and inactive organic compounds. 11. Define alkanes and explain the preparation of alkanes by various organic reactions. 12. Define cycloalkanes and explain the synthesis of cycloalkanes. 13. Discuss E1 & E2 mechanism. 14. Explain Diels Alder reaction. 15. Explain modern theory of aromaticity.
Analytical Chemistry		1. Explain additive and constitutive properties with suitable examples 2. Explain the term surface tension, viscosity, parachor, polar and non-polar molecule, dielectric constant, induced polarization 3. Explain advantages of refractive index by Abbe's refract meter. 4. Discuss the types of pollutions. 5. Explain the Greenhouse effect. 6. Discuss the type's water pollution. 7. Explain in detail Distillation process. 8. To study the determination of molecular weight of various titration method. 9. To study the molecular formula determination. 10. To estimate sulphur, carbon, hydrogen by various methods. 11. To study the synthesis and uses of various drugs.
Practical	**Physical chemistry**	1. To determine the viscosity of viscous liquids. 2. To determine the equivalent weight of magnesium metal. 3. To study the rate of reactions. 4. To understand the heat of ionization of acids and bases.
	Inorganic chemistry	1. To prepare standard solution and determine its strength. 2. Detection of spot test by using various inorganic reagents. 3. To study the chromatography technique.
	Organic chemistry	1. To study the identification of organic compounds by using organic reagents. 2. To determine strength of organic samples. 3. To synthesis and preparation of various organic compounds.

Name of the Course	Course Outcomes
	1. To study UV spectroscopy.

B. Sc –II, Semester-III Organic Chemistry	2. Discuss different reactions and it's mechanism 3. Discuss the structure and reactivity of carbonyl compounds. 4.To understand Alcohols and phenols with different reactions 5.To study Conformational isomerism of aldehydes and ketones 6. To represent different projection formal. 7. To explain conformational analysis of ethane and n-butane 8. To determine D & L, R &S and E & Z nomenclature. 9. To study Ether and Epoxide. 10. To study the diazonium salt and synthesis of methyl orange and cango red. 11. To study the mono carboxylic acids, carboxylic acid, hydroxyl acid and unsaturated acids.
Inorganic Chemistry	1. Know the meaning of various terms involved in co-ordination chemistry 2. To understand Werner's formulation of complexes and identify the types of valences 3. Know the limitations of VBT 4. General characteristics of 3 d- elements. 5. To Compare 1st transition series with 2nd and 3rd transition series. 6. Draw the geometrical and optical isomerism of complexes 7. To explain Pearson concept (HSAB) for acid and base. 8. Application and limitations of HSAB principle. 9. Brief introduction of ligand, chelating agent, chelation and metal chelate. 10. Difference between metal chelate and metal complex. 11. Application of chelation w.r.t. EDTA and DMG.

Name of the Course	Course Outcomes
B.Sc.-II, Semester-IV	1. To study the types of conductors. 2. Explain specific and equivalent conductance with concentration. 3. Explain the migration of ions, Hittorf's rule and Transport number. 4. To determine the transport number by moving boundary methods. 5. To discuss factors influencing transport number.

Physical Chemistry		6. State the Kohlrausch law and its application. 7. To solve the numerical problems. 8. To study the concept of entropy, mathematical expression, unit and its physical significance. 9. To study the entropy change for reversible and irreversible processes. 10. To study the entropy change in physical transformation. 11. State and explain Third law of thermodynamics. 12. State and explain Laws of crystallography. 13. To study the Weiss indices and miller indices. 14. Discuss the diffraction of X- rays and derive Bragg's equation. 15. To determine the crystal structure of NaCl and KCl on the basis of Bragg's equation. 16. State Nernst distribution law and its applications. 17. Discuss the problem based on distribution coefficient an extraction techniques
Analytical & Industrial Inorganic Chemistry .		1. To study the volumetric analysis and their types. 2. To study the acid base titration. 3. To study the complex metric titration. 4. To study the gravimetric analysis. 5. To explain the types of precipitation and process of precipitation. 6. To distinguish between co-precipitation and post precipitation 7. To explain role of organic precipitance in gravimetric analysis. 8. To study the advantages and disadvantages of organic precipitance. 9. Discuss manufacture of heavy chemicals i.e. Ammonia & Sulphuric acid. 10. To study the types of ores. 11. To study the extraction of Iron by Blast furnace. 12. To study the types of Iron. 13. To study the types of Steel. 14. Explain manufacture of steel by Bessemer and L. D Process.
	Physical Chemistry	1. To determine the rate constant. 2. To determine the strength of acids. 3. To determine the viscosity of mixed viscous liquids. 4. To determine the Refractive index. 5. By using conduct metric titration calculate specific, equivalent and molecular conductivity.
	Inorganic	1. To study the gravimetric analysis of Fe, Ba.

Practical	**Chemistry**	2. To determine the Quality of inorganic sample 3. To analyses the fertilizer. 4. To prepare inorganic complex and determine its purity.
	Organic Chemistry	1. To identify organic compounds and determine its physical constant 2. To determine the amount of organic sample. 3. To prepare different organic compounds and determine its melting point.
Name of the Course		**Course Outcomes**
B. Sc – III, Semester-V **Physical Chemistry**		1. Know the meaning of phase, component and degree of freedom. 2. To study the one & two component system. 3. Know the Redox reaction. 4. To explain the types of electrode 5. Solve the cell reaction and calculate EMF. 6. To study the photochemical reactions. 7. To determine the quantum yield.
Inorganic Chemistry		1. Know the meaning of various terms involved in co-ordination chemistry 2. To understand Werner's formulation of complexes and identify the types of valences 3. Know the limitations of VBT 4. To study the CFT, MOT and explain the application of MOT 5.To study the types of nuclear reaction 6 To study the nuclear fusion and fission reaction 7 To understand types of Fertilizers and its application 8 To study the role and synthesis of catalyst and its application 9 Study the Bio-inorganic chemistry.
Organic Chemistry		1. To study IR, NMR and Mass spectroscopy. 2. Discuss different types of rearrangement reactions. 3. Determine structure of compound by spectroscopic methods. 4. Discuss the various name reaction with its mechanism 5.To understand Baeyer's Strain Theory and Stainless Ring's 6. To study the conformation and stability of cyclohexane. 7. To study the stereo selective and stereospecific reaction with example. 8. To study the reactive methylene group with its synthetic applications.
Analytical & Industrial physical Chemistry		1. Explain Beer's law and Lambert's Beer's Law 2. To Understand the various methods of color measurement. 3. To study the calomel,Quinhydrone and Glass Electrodes and their use in Determination of pH

.	4. To study the Potentiometric titrations CO-5. Discuss the Electroplating of Cromium and nickel 6.To study the electrolysis and Faraday's laws 7.To study the various components of flame photometer 8.Explain the application of flame photometry in qualitative and quantitative analysis 9. To study the cell constant ,conductivity cell 10. Explain the Conductometric titration with example
Name of the Course	**Course Outcomes**
B.Sc. III, Semester-VI Physical Chemistry	1.To study the molecular spectroscopy such as Rotational and Vibrational 2.Derive the expression for rotational spectra for the transition from J to J+1 3.Derive the expression for Vibrational spectra for the transition from V to V+1 4. Study the Raoults Law 5.Distinction between Ideal and Non –ideal Solution 6. To study the vapor pressure and Boiling of Miscible Liquids 7. To study the solubility of partially miscible liquids 8. To explain the criteria for thermodynamic equilibrium and spontaneity 9. To study the Gibb's Helmholtz,Clapeyron- Clausius equation 10. To study the Law of mass action 11.To explain fugacity and activity concepts 12.ExplainCounter,competing,consecutivand chain reaction 13.Discuss collision theory and explain energy of activation 14.To study the third order reaction with example
Inorganic Chemistry	1. To Study the electronic configuration of lanthanides and actinides. 2. To Study the types conductor and application of semiconductor. 3. Understand the p-type and n-type semiconductor 4.To study the types of borne compounds and its application 5.To understand the Organometallic compounds 6. to study the corrosion and passivity
Organic Chemistry	1.To study the various heterocyclic compounds with its synthetic applications 2. Discuss the structure and configuration D-glucose. 3. To study the types of carbohydrates with example. 4. To study the structure, synthesis of vitamins and hormones. 5. Explain the general idea and classification of drugs. 6. To synthesize various drugs and its uses.

	7. To Study the structure and synthesis of various dyes. 8. To study the various types of agrochemicals. 9. To synthesize and uses of agrochemicals 10. Explain general idea of agrochemicals.	
Analytical& Industrial Organic Chemistry	1. Know the different analytical techniques. 2. To understand different types of separation techniques. 3. To study principle, construction and working of paper, TLC, Column, Ion exchange, GC, HPLC. 4. To give an extended knowledge about chromatographic techniques used for separation and determine its Rf value. 5. Discuss different raw materials used in soap manufacturing. 6. To compare soaps and detergents. 7. Discuss the classification of polymers with suitable example. 8. Discuss the methods of preparation and uses of polymers. 9. Discuss in details various steps involved in manufacturing of sugar. 10. Explain various conditions necessary for successful fermentation. 11. Explain the reducing agent that is $LiAlH_4$, $NaBH_4$ with its mechanism and its application 12. Explain oxidizing agent OsO_4, SeO_2 with its mechanism and its application. 13. To study the green chemistry and its use in green approaches.	
Practical	**Physical Chemistry**	1. Developed expertise relevant to the professional practice of chemistry. 2. Developed and understanding of breadth and concepts of physical chemistry. 3. An understanding of methods employed for problem solving in physical chemistry. 4. Experience in some scientific methods employed in physical chemistry. 5. Developed skills in procedures and instrumental methods and practical tasks of physical chemistry. 6. Developed skills in the scientific methods of planning, developing, conducting, reviewing and reporting experiments. 7. The course provides training in physical chemistry laboratory techniques. 8. Experiments are guided by demonstrators and to introduce typical instrumentation.
		1. To study the gravimetric analysis of Fe, Ba and Ni.

	Inorganic Chemistry	2. Prepare various inorganic complexes and determine its percentage purity. 3. To study the commercial samples. 4. To study the volumetric analysis.
	Organic Chemistry	1. Perform Binary mixtures. 2. Preparation of organic compounds, their purification and run TLC. 3. Determination of physical constant Melting point & Boiling point 4. Different separation techniques. 5. Preparation of organic derivative and determine its Melting point. 6. To estimate the amount of sugar sample, oil sample and formalin sample.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- I (Semester- II)	
Name of the Subject: BOTANY	
Paper number: IV	
Name of the paper: Taxonomy of Angiosperms	
Course content	**Outcomes**
Unit 1: Introduction	The student can understand about importance of taxonomy.
Unit 2: Classification	The student can understand about classification systems in taxonomy.
Unit 3: Identification and nomenclature	The student can understand different methods of classification and rules of Nomenclature.
Unit 4: Herbarium and Botanical Garden	The student can understand technique of herbarium preparation and importance of botanical gardens in India.

Unit 5: Study of Angiosperm families	The student can understand detailed identifying characters of family.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- I	
Name of the Subject: BOTANY	
Practical: Based on paper no I to IV	
Course content	**Outcomes**
1.Study of microscope	The student can understand different parts and careful handling of microscope.
2. Electron micrographs/Models of viruses	The student can understand different types of Electron micrographs/Models of viruses- T-Phage and TM by using photographs/models
3. Gram staining	The student can understand Gram staining technique and forms of Bacteria.
4. Identification of Algae.	The student can understand diversity and structure of algal thallus of *Volvox*, *Sargassum, Gracillaria*.
5. Study of *Nostoc*	The student can understand the life cycle of *Nostoc*.
6.Study of *Spirogyra*	The student can understand the life cycle pattern of *Spirogyra.*
7. Identification of Fungi.	The student can understand diversity and structure of fungal mycelium of *Albugo, Penicilium, Agaricus*.
8. Study of *Mucor*	The student can understand the life cycle pattern of *Mucor*.
9. Study of Yeast	The student can understand the life cycle pattern of Yeast.
10. Identification of Archegoniates	The student can understand diversity and structure of thallus of Archegoniates- *Marchantia, Adantium, Pinus*
11. Study of *Riccia*	The student can understand the life cycle pattern of *Riccia*.
12.Study of *Selaginella*	The student can understand the life cycle pattern of *Selaginella* with respect to Morphology of sporophyte and anatomy of stem, Strobilus.
13. Study of *Cycas*	The student can understand the life cycle pattern of *Cycas* with respect to Morphology of sporophyte and anatomy of leaflet.
14. Study of *Cycas*	The student can understand the life cycle pattern of *Cycas* with respect to Reproductive structure: male cone, microsporophyll, microspore and megasporophyll, L. S. of ovule (permanent slide).
15. - 18. Study of plant	The student can understand the Systematic position, Morphological

families.	& distinguishing characters with economic importance of given plant families.
19. Soil pH	The student can understand pH of soil and check their range by using universal indicator/pH paper/pH meter.
20. Water holding capacity	The student can understand the water holding capacity of different soils.
21. Meteorological instruments	The student can understand the working and uses of different meteorological instruments.
22. Quadrat method	Density and Frequency of different plant species by quadrat method.
23. Ecological adaptations of Hydrophytes	The student can understand the ecological adaptations in Hydrophytes in *Hydrilla*, *Eichhornia* and *Typha*.
24. Ecological adaptations of Xerophytes	The student can understand the ecological adaptations in Xerophytes in *Nerium* and *Aloe*.
25. Excursion report	By botanical excursion analyze the students with an intense, but balanced overview of about forest and vegetation types, & plant species diversity
Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- II (Semester- III)	
Name of the Subject: BOTANY	
Paper number: V	
Name of the paper: Anatomy and Taxonomy of Angiosperms	
Course content	**Outcomes**
Unit 1: Apical Meristem	The student can understand about the introduction and Classification of meristems along with Functions of meristems and Theories of structural development.
Unit 2: Permanent tissues	The student can understand about the structure and functions of simple & Complex tissues and types of vascular bundles
Unit 3: Tissue systems and their functions	The student can understand about the Epidermal Secretory & Mechanical Tissue System
Unit-4: Secondary body of the plant	Normal Secondary growth in Dicot root and stem. Periderm, Lenticels and Annual rings. Basic structure of wood and its types.
Unit-5: Taxonomy of Angiosperms	The student can understand about the Morphology of Inflorescence, Flower, Fruit of Angiosperm families with respect to classification, morphology of vegetative and reproductive parts, floral formula,

	floral diagram, diagnostic features and economic importance. a) Combretaceae b) Asclepiadaceae c) Amaranthaceae d) Liliaceae.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- II (Semester- III)	
Name of the Subject: BOTANY	
Paper number: VI	
Name of the paper: Plan Ecology	
Course content	**Outcomes**
Unit 1: Introduction	The student can understand about the Climatic factors and Edaphic factors
Unit 2: Community Ecology	The student can understand about the Form and structure of communities, Classification and Physiognomy and Community characteristics
Unit 3: Ecosystem	Concept and types, Components and Organization of ecosystem, Ecological pyramids, Food chains and food webs. Moreover Energy flow in ecosystem, Biogeochemical cycles.
Unit 4: Ecological Succession	The student can understand about the Concept and process of succession along with Hydrosere and xerosere.
Unit-5: Ecological adaptations	The student can understand about the Introduction and Xeric, Hydric and Mesic adaptations
Unit 6: Pollution	The student can understand about the Introduction and Air pollution and Water pollution.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- II (Semester- IV)	
Name of the Subject: BOTANY	
Paper number: VII	
Name of the paper: Plant Physiology and Cytogenetics	
Course content	**Outcomes**
Unit 1: Photosynthesis	The student can understand about the Introduction and significance and Photosynthetic apparatus, Photosynthetic

	pigments, Photosystems, Light reaction ad Dark reactions.
Unit 2: Nitrogen metabolism	The student can understand about the Introduction of Nitrogen cycle, Biological N2 fixation, Mechanism of Biological Nitrogen fixation and Significance of Biological Nitrogen fixation.
Unit 3: Genetics	The student can understand about the Introduction, terminology Mendelism Principles of inheritance and Gene interaction.
Unit 4: Classical genetics	The student can understand about the Linkage and Crossing over.
Unit 5: Multiple allelism	The student can understand about the Multiple allelism.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- II (Semester- IV)	
Name of the Subject: BOTANY	
Paper number: VIII	
Name of the paper: Economic Botany	
Course content	**Outcomes**
Unit 1: Legumes	The student can understand about the Legumes and their Economic importance
Unit 2: Plant Fibers	The student can understand about the fiber yielding plants and their Economic importance
Unit 3: Vegetable oil sources	The student can understand about the source and economic importance Brief account of cultural practices of Ground nut and Soybean.
Unit 4: Drug Yielding plants	The student can understand about the brief account of plant drugs and their chief constituents used in Indigenous and allopathic systems.
Unit 5: Natural Products	The student can understand about the properties of rubber, source (*Hevea brasilensis*), morphologicl characters, extraction method and economic importance along with Botanical pesticides of it.
Unit 6: Ornamental Plants	The student can understand about the ornamental value of following plants.
Unit 7: Plants perfumes and cosmetics	The student can understand about the Botanical name, source and economic importance perfumes and cosmetics plant species.

Name of the Faculty: Science and Technology

Name of the Course: B.Sc. Part- II	
Name of the Subject: BOTANY	
Practical: Practical No. I (Based on Paper – V &VI)	
Course content	**Outcomes**
1. Study of organization in shoot tips	The student can understand the organization in shoot tips.
2. Study of organization in root tips	The student can understand the organization in root tips by using V.S. of Onion root and aerial roots of *Ficus*.
3. Secondary growth in dicot	The student can understand the Secondary growth in dicot stem and root.
4. Anomalous secondary growth	The student can understand the Anomalous secondary growth in *Bignonia* stem by using permanent double stained technique.
5. Anomalous secondary growth	The student can understand the Anomalous secondary growth in *Dracaena* stem by using permanent double stained technique.
5. Maceration technique	The student can understand the Maceration technique.
6. Mechanical tissue system	The student can understand the Mechanical tissue system.
7. Secretory tissue system	The student can understand the Secretory tissue system.
8. Anatomy of wood	The student can understand the anatomy of porous (ring porous & diffused porous) and non-porous wood.
9. Morphology of Inflorescence	The student can understand the Morphology of Inflorescence.
10. Morphology of Flower.	The student can understand the Morphology of Flower
11. Morphology of Fruit	The student can understand the Morphology of fruit
12-15. Angiosperm families	The student can understand about the Angiosperm families with respect to classification, floral formula, floral diagram, diagnostic features and economic importance. a) Caesalpiniaceae b) Solanaceae c) Nyctaginaceae

	d) Liliaceae.
16. Meteorological instruments	The student can understand the working and uses of different meteorological instruments.
17. Soil pH	The student can understand pH of soil and check their range by using universal indicator/pH paper/pH meter.
18. Water holding capacity	The student can understand the water holding capacity of different soils.
19-20. Quadrat method	Density and Frequency of different plant species by quadrat method.
21. Ecological adaptations of Hydrophytes	The student can understand the ecological adaptations in Hydrophytes in *Hydrilla*, *Eichhornia* and *Typha*.
22. Ecological adaptations of Xerophytes	The student can understand the ecological adaptations in Xerophytes in *Nerium* and *Aloe*.
23. Ecological adaptations of Epiphyte	The student can understand the ecological adaptations in Epiphyte (orchid) and parasite (***Cuscuta***).
24. Detection of Sulphate & Chloride	The student can understand the how to detect the Sulphate and Chloride from polluted water sample.
25. Excursion report	By botanical excursion analyze the students with an intense, but balanced overview of about forest and vegetation types, & plant species diversity.
Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- II	
Name of the Subject: BOTANY	
Practical: Practical No. II (Based on Paper – VII &VIII)	
Course content	**Outcomes**
1. Paper chromatography	The student can understand the how to separate the photosynthetic pigments by ascending Paper chromatography.
2. Effect of CO2 concentration on the rate of	The student can understand the how the CO2 effects on concentration on the rate of photosynthesis.

photosynthesis	
3. Kranz anatomy	The student can understand the C2 and C4 plants by Kranz anatomy.
4 Estimation of TAN	The student can understand Estimation of TAN of given plant species.
5. Study of root nodules	The student can understand bacterial species in the root nodules of legume crop
6. Study of mendelian traits	The student can understand the mendelian traits.
7. Study of multiple alleles	The student can understand the multiple alleles – eye color in Drosophila (with the help of photographs).
8. Study of meiosis	The student can understand the Smear preparation by using onion buds for meiosis.
9-10. Problems on linkage and crossing over	The student can understand and solve the Problems on linkage and crossing over
11. Study of Vegetative, Floral morphology	The student can understand the Vegetative, Floral morphology and pod in Chickpea, Red gram.
12. Study of fodder legumes	The student can understand the fodder legumes- Source and uses of *Sesbania* and Lucern.
13. Study of structure of oil storing tissues	The student can understand the Study of structure of oil storing tissues in sectioned seeds of Groundnut, and Coconut endosperm using micro chemical tests.
14. Study of vegetative, Floral and Fruit morphology of Cotton	The student can understand the vegetative, Floral and Fruit morphology of Cotton. Microscopic structure Cotton fiber.
15-18. Study of drug plants	The student can understand the drug resources plant species.
19. Study of plant pesticides	The student can understand the pesticides plant species.
20. Study of dyes	The student can understand the source and uses of dye yielding plant species.
21-22. Study of ornamental plants	The student can understand the ornamental plants, i.e. seasonal, annual & perennial flowering plants and their botanical name,

	morphology and uses etc.
23. Study of plant perfumes and cosmetics	The student can understand the species of plant perfumes and cosmetics.
24-25. Horticultural term Paper	The student can understand how to prepare Horticultural term Paper.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- III (Semester- V)	
Name of the Subject: BOTANY	
Paper number: IX	
Name of the paper: Reproductive Biology of Angiosperms	
Course content	**Outcomes**
Unit1: Reproductive development	The student can understand about the reproductive development in Angiosperm.
Unit 2: Anther and pollen biology.	The student can understand about the anther and pollen biology.
Unit 3: Ovule	The student can understand about the ovule with respect to their structure, types and developments.
Unit 4: Pollination and fertilization	The student can understand about the Pollination and fertilization with respect to types and significance, structure of stigma and style, double fertilization, path of pollen tube.
Unit 5: Embryo, Endosperm	The student can understand about the structure and types of endosperm, monocot and dicot seed and seed dispersal.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- III (Semester- V)	
Name of the Subject: BOTANY	
Paper number: X	
Name of the paper: Genetics	
Course content	**Outcomes**

Unit 1: Sex Determination	The student can understand about the Sex Determination.
Unit 2: Quantitative inheritance	The student can understand about the Quantitative inheritance.
Unit 3: Extra chromosomal inheritance	The student can understand about the Extra chromosomal inheritance.
Unit 4: Alteration in the genetic make-up and its significance	The student can understand about the Alteration in the genetic make-up and its significance with respect to numerical and Structural Changes in chromosomes
Unit 5: Gene mutations	The student can understand about the Gene mutations with respect to Types of mutations; Molecular basis of Mutations and Mutagens

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- III (Semester- V)	
Name of the Subject: BOTANY	
Paper number: XI	
Name of the paper: Plant Physiology	
Course content	**Outcomes**
Unit 1: Plant-water relations	The student can understand about the Plant-water relations with respect to Water Potential, Water absorption, Ascent of sap and Transpiration.
Unit 2: Mineral nutrition	The student can understand about the Mineral nutrition with respect to Macro and Micronutrients their deficiency symptoms and roles.
Unit3: Nutrient Uptake	The student can understand about the Nutrient Uptake with respect to Soil as a nutrient reservoir and Types of Absorption.
Unit 4: Phloem Transport	The student can understand about the Phloem Transport with respect to Site of Phloem transport Phloem loading and unloading.
Unit 5: Plant growth regulators	The student can understand about the Plant growth regulators with respect to Types, Chemical structure, Physiological roles and practical applications.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- III (Semester- V)	
Name of the Subject: BOTANY	
Paper number: XII	
Name of the paper: Plant Breeding	
Course content	**Outcomes**
Unit 1: Plant Breeding	The student can understand about the Plant Breeding with respect to Aim and objectives and Scope.
Unit 2: Methods of crop improvement	The student can understand about the Methods of crop improvement with respect to Centers of origin, Plant genetic resources, Selection methods, Hybridization in self-pollinated and cross pollinated crop plants.
Unit3: Quantitative inheritance	The student can understand about the Quantitative inheritance and their concept and mechanism.
Unit 4: Mutation and Plant breeding	The student can understand about the Mutation and Plant breeding and their roles.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- III (Semester- VI)	
Name of the Subject: BOTANY	
Paper number: XIII	
Name of the paper: Molecular Biology	
Course content	**Outcomes**
Unit 1: Nucleic acids	The student can understand about the Nucleic acids with respect to Historical perspective and DNA genetic information.
Unit 2: The Structures of Genetic Material	The student can understand about the Structures of Genetic Material with respect to DNA: Watson and Crick model, Types of DNA, Denaturation and renaturation of DNA, Organization of DNA in Prokaryotes and Eukaryotes, Structure Types of RNA.
Unit 3: Replication of DNA	The student can understand about the Replication of DNA with respect to Synthesis, Replication and Enzymes involved in DNA replication.
Unit 4: Transcription	The student can understand about the Transcription.

Unit 5: Translation	The student can understand about the Translation.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- III (Semester- VI)	
Name of the Subject: BOTANY	
Paper number: XIV	
Name of the paper: Plant Biotechnology	
Course content	**Outcomes**
Unit 1: Recombinant DNA Technology	The student can understand about the Recombinant DNA Technology.
Unit 2: Methods of Gene transfer	The student can understand about the Methods of Gene transfer.
Unit 3: Gene Cloning	The student can understand about the Gene Cloning with respect to Recombinant DNA, Bacterial transformation, PCR.
Unit 4: Plant Tissue culture	The student can understand about the techniques of Plant Tissue culture.
Unit 5: Applications of Biotechnology	The student can understand about the Applications of Biotechnology in/as Pest resistant, herbicide resistant plant, Transgenic crops with improved quality traits.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- III (Semester- VI)	
Name of the Subject: BOTANY	
Paper number:XV	
Name of the paper: Plant Metabolism	
Course content	**Outcomes**
Unit1: ATP-Synthesis	The student can understand about the Structure And Mechanism of ATP synthesis.
Unit 2: Carbon Oxidation	The student can understand about the Carbon Oxidation with respect to Glycolysis, Pentose phosphate pathway, oxidative decarboxylation, Regulation of PDH, NADH, TCA cycle

	Mitochondrial electron transport, oxidative phosphorylation and cyanide resistant respiration.
Unit3: Carbohydrate Metabolism	The student can understand about the Carbohydrate Metabolism with respect to Introduction and broad classification of Monosaccharides, Oligosaccharides, Polysaccharides, and its Biosynthesis, Degradation.
Unit 4: Lipid Metabolism	The student can understand about the Lipid Metabolism with respect to Introduction and classification, Saturated fatty acids, Unsaturated fatty acids, outline of fatty acid biosynthesis, Beta oxidation, Gluconeogenesis, and Properties and significance of lipids.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- III (Semester- VI)	
Name of the Subject: BOTANY	
Paper number: XVI	
Name of the paper: Biostatistics	
Course content	**Outcomes**
Unit1: Introduction	The student can understand about the Introduction of Biostatistics as in Basic principles, Statistical methods and Variables.
Unit 2: Collection of primary and secondary data	The student can understand about the Collection of primary and secondary data with reference to Types of data, Methods of data collection, Merits and demerits, Classification of data, Tabulation and presentation of data.
Unit 3: Measures of central tendency	The student can understand about the Measures of central tendency with respect to Mean, median and mode, Measures of dispersion and Co-efficient of variations.
Unit 4: Probability	The student can understand about the Probability with respect to Basic Concepts, Kinds of Probabilities,

	Measures of Probability etc.
Unit 5: Statistical inference	The student can understand about the Statistical inference with respect to Hypothesis– Student‘t’ test and chi square test and its significance.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- III	
Name of the Subject: BOTANY	
Practical: Practical IV: Reproductive Biology of Angiosperms and Molecular Biology	
Course content	**Outcomes**
1. Study of anther wall and tapetum (through slides / micrographs).	Students can understand the structure of anther wall and tapetum by using through slides / micrographs.
2. Pollen grains: Fresh or acetolyzed showing ornamentation and aperture, pollinia (slides/photographs, fresh material).	Students can understand the structure of Pollen grains: Fresh or acetolyzed showing ornamentation and aperture, pollinia by using slides, photographs, and fresh material.
3. Pollen viability test, calculation of germination percentage.	Students can understand Pollen viability and they calculate the germination percentage.
4. Diversity of style and stigma.	Students can understand structure and study the Diversity of style and stigma.
5. Study of Ovule: Types - anatropous, orthotropous, amphitropous, campylotropous, circinotropous	Students can understand structure and study ovule types - anatropous, orthotropous, amphitropous, campylotropous, circinotropous
6. Study of unitegmic, bitegmic ovule, tenuinucellate and crassinucellate;	Students can understand structure and study unitegmic, bitegmic tenuinucellate and crassinucellate ovule
7. Female gametophyte through permanent slides / photographs.	Students can understand structure and development of gametophyte through permanent slides / photographs
8. Intra-ovarian pollination; Test tube pollination through photographs.	Students can understand structure and development Intra-ovarian pollination; Test tube pollination through photographs.
9. Endosperm: Dissections of developing seeds for endosperm with free-nuclear haustoria.	Students can understand structure and development of Endosperm: dissections of developing seeds for endosperm with free-

	nuclear haustoria
10. Embryogenesis: Study of development of dicot embryo through permanent slides.	Students can understand structure and development of Embryogenesis i.e. development of dicot embryo through permanent slides.
11. Identification of genus and species with the help of flora.	Students can understand the study of identification of genus and species with the help of flora.
12. Herbarium techniques.	Students can understand the study of the Herbarium techniques.
13. Tour Report-Industrial / Research Institute / Field visit (Submit separate Report).	By botanical excursion analyze the students with an intense, but balanced overview of about forest and vegetation types, & plant species diversity.
14. Microtomy / Micrograph.	Students can understand the technique of Microtomy or Micrograph.
15. Preparation of LB medium and raising E.Coli.	Students can understand the technique of Preparation of LB medium and raising E.Coli.
16. Isolation of genomic DNA from E.Coli.	Students can understand the technique of isolation of genomic DNA from E.Coli.
17. DNA isolation from cauliflower head.	Students can understand the technique of isolation of DNA from cauliflower head.
18. Qualitative and Quantitative estimation of DNA by diphenylamine reagent.	Students can understand the technique of Qualitative and Quantitative estimation of DNA by diphenylamine reagent.
19. Qualitative and Quantitative estimation of RNA by Orcinol reagent.	Students can understand the technique of Qualitative and Quantitative estimation RNA by Orcinol reagent.
20-22. Study of DNA replication mechanisms through photographs.	Study of DNA replication mechanisms through photographs (Rolling circle, Theta replication and semi-discontinuous replication).
23. Study of structures of prokaryotic RNA polymerase and eukaryotic RNA polymerase II through photographs.	Students can understand the structures of prokaryotic RNA polymerase and eukaryotic RNA polymerase II through photographs.
24. Photographs establishing nucleic acid	Students can understand the structures of

as genetic material (Griffith's experiments).	nucleic acid as genetic material (Griffith's experiments) through photographs.
25. Demonstration of dialysis of starch and simple sugar.	Students can understand the technique of demonstration the dialysis of starch and simple sugar.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- III	
Name of the Subject: BOTANY	
Practical: Practical V: Genetics and Plant Biotechnology	
Course content	**Outcomes**
1. Examples based on polygene inheritance.	The students can understand how to solve examples based on polygene inheritance.
2. Examples based on Population Genetics (Hardy-Weinberg Law).	The students can understand how to solve examples based on Population Genetics (Hardy-Weinberg Law).
3. Pedigree analysis for dominant and recessive autosomal and sex linked traits.	The students can understand the pedigree analysis for dominant and recessive autosomal and sex linked traits.
4. Study of aneuploidy: Down's, Klinefelter's and Turner's syndromes (Photograph).	The students can understand the aneuploidy: Down's, Klinefelter's and Turner's syndromes (Photograph).
5. Induction of polyploidy in plants using colchicine. Different methods of application of colchicine (Demo).	The students can understand the study the induction of polyploidy in plants using colchicine. Different methods of application of colchicine (Demo).
6. Detection of meiotic anomalies in chromosomes in *Rhoeo.*	The students can understand the meiotic anomalies in chromosomes in *Rhoeo.*
7. Study of human genetic traits: Sickle cell anemia, color blindness by photographs.	The students can understand the human genetic traits: Sickle cell anemia, color blindness by photographs.
8. Effect of mutagen on genetic material by scoring the chromosomal aberrations.	The students can understand the effect of mutagen on genetic material by scoring the chromosomal aberrations.
10. Study polytene chromosomes in *Drosophila* larvae.	The students can understand the structure polytene chromosomes in *Drosophila* larvae.
11. Study of the karyotype and prepare	The students can understand the karyotype and

ideogram of any two plant species by photograph.	prepare ideogram of any two plant species by photograph.
12. Problem on population genetics	The students can understand how to solve given problem on population genetics.
13. Tools and techniques used in biotechnology.	The students can understand tools and techniques used in biotechnology.
15. Study of recombinant vectors with the help of photographs.	The students can understand recombinant vectors with the help of photographs.
16. Tissue culture techniques.	The students can understand and study the tissue culture techniques.
17-18. Preparation of MS media.	The students can understand the technique of preparation of MS media.
19. Demonstration of *in vitro* sterilization and inoculation methods using leaf and explants.	The students can understand the technique for demonstrate *in vitro* sterilization and inoculation methods using leaf and explants.
20. Study of anther, embryo and endosperm culture, micro propagation.	The students can understand the technique for another, embryo and endosperm culture, and micro propagation.
21. Isolation of protoplasts.	The students can understand the technique for isolation of protoplasts.
22. Construction of restriction map of circular and linear DNA from the data provided.	The students can understand the technique for construction of restriction map of circular and linear DNA from the data provided.
23. Study of methods of gene transfer through photographs / video (ICT).	The students can understand the technique for gene transfer *Agrobacterium* mediated, direct gene transfer by electroporation, microinjection.
24. Study of steps in genetic engineering for production of Bt cotton and Golden rice.	The students can understand the steps in genetic engineering for production of Bt cotton and Golden rice.
25. Isolation of plasmid genomic DNA.	The students can understand the technique for isolation of plasmid genomic DNA and confirm by DPA.

Name of the Faculty: Science and Technology
Name of the Course: B.Sc. Part- III

Name of the Subject: BOTANY	
Practical: Practical VI: Plant Physiology and Plant Metabolism	
Course content	**Outcomes**
1. Determination of osmotic potential of plant cell sap by plasmolytic method.	The students can understand the technique for determination of osmotic potential of plant cell sap by plasmolytic method.
2. Determination of water potential of given tissue (potato tuber) by weight method.	The students can understand the technique for determination water potential of given tissue (potato tuber) by weight method.
3. Study of the effect of light on the rate of transpiration.	The students can understand the effect of light on the rate of transpiration.
4. 5. & 6. Calculation of stomatal index and stomatal frequency from the two surfaces of leaves of a mesophyte and xerophyte.	The students can understand how to calculate stomatal index and stomatal frequency from the two surfaces of leaves of a mesophyte and xerophyte.
7. Mineral deficiency symptoms and roles of Macro (N, P, K, Ca, Mg) elements.	The students can understand mineral deficiency symptoms and roles of Macro (N, P, K, Ca, Mg) elements.
8. Mineral deficiency symptoms and roles of Micro (B, Cu, Mn, Mo) elements.	The students can understand mineral deficiency symptoms and roles of Micro (B, Cu, Mn, Mo) elements.
9. Phenomenon of seed germination (effect of light).	The students can understand the phenomenon of seed germination (effect of light).
10. Effect of different concentrations of IAA, on seed germination	The students can understand the effect of different concentrations of IAA, on seed germination.
11. Effect of different concentrations of GA, on seed germination	The students can understand the effect of different concentrations of GA, on seed germination.
12. Induction of amylase activity in germinating seeds	The students can understand the induction of amylase activity in germinating seeds.
13. Fruit ripening by hormonal treatment.	The students can understand the fruit ripening by hormonal treatment.
14. Rooting from cuttings by hormonal treatment.	The students can understand the how rooting form from cuttings by hormonal treatment.

15& 16 Rate of respiration in different parts of plant.	The students can understand the rate of respiration in different parts of plant.
17. Qualitative tests for sugars in plant material.	The students can understand the qualitative tests technique for sugars in plant material.
18. Qualitative tests for starch and cellulose in plant material.	The students can understand the qualitative tests technique for starch and cellulose in plant material.
19. Determination of Carbohydrate by Anthrone Method.	The students can understand the technique for determination of Carbohydrate by Anthrone Method.
20. Measure the sugar percentage by hand refrectometer.	The students can understand the technique for measurement the sugar percentage by hand refrectometer.
21. Qualitative tests for lipids in plant material.	The students can understand the qualitative tests technique for lipids in plant material.
22. Determination of fatty acid value of oil sample.	How to determine the fatty acid value of given oil sample.
23. Study the activity of lipases in germinating oilseeds and demonstrate mobilization of lipids during germination.	The students can understand the activity of lipases in germinating oilseeds and demonstrate mobilization of lipids during germination.
24. Demonstration of fluorescence by isolated chlorophyll pigments.	The students can understand the how to study the demonstration of fluorescence by isolated chlorophyll pigments.
25. Visit to research center.	By botanical research excursion analyze the students with an intense, but balanced overview of about research methodology.

Name of the Faculty: Science and Technology	
Name of the Course: B.Sc. Part- III	
Name of the Subject: BOTANY	
Practical: Practical VII: Plant Breeding and Biostatistics	
Course content	**Outcomes**
1. Study floral biology in self-pollinated	The students can understand the floral biology

crop plants	self-pollinated crop plants.
2. Study floral biology in cross pollinated crop plants.	The students can understand the floral biology in cross pollinated crop plants.
3. Pollen viability.	The students can understand the technique pollen viability.
4. Calibration of ocular micrometer and estimate the size of pollen grain.	The students can understand calibration of ocular micrometer and estimate the size of pollen grain.
5. Hybridization techniques in Malvaceae.	The students can understand the technique of hybridization techniques in Malvaceae.
6. Hybridization techniques in Fabaceae.	The students can understand the technique of hybridization techniques in Fabaceae.
7. Hybridization techniques in Brassicaceae.	The students can understand the technique of hybridization techniques in Brassicaceae.
8. Hybridization techniques in Poaceae.	The students can understand the technique of hybridization techniques in Poaceae.
9. Study of male sterility in sorghum in field or in laboratory by staining the pollen grain.	The students can understand the male sterility in sorghum in field or in laboratory by staining the pollen grain.
10. Studies on Learning the precautions on handling of different mutagenic agents.	The students can understand learning the precautions on handling of different mutagenic agents: Physical and chemical mutagens.
11. Methods of estimation of Heterosis (i) Mid- Parent Heterosis (ii) Better parent Heterosis (iii) Standard Heterosis (Demo).	The students can understand the methods of estimation of Heterosis (i) Mid- Parent Heterosis (ii) Better parent Heterosis (iii) Standard Heterosis (Demo).
12. Determination of interspecific variation in chromosome number in *Allium.*	The students can determine interspecific variation in chromosome number in *Allium.*
13-15. Collection of Data and tabulation.	The students can understand the Collection of Data and tabulation.
16-17 Methods of sampling.	The students can understand the methods of sampling.

18. Presentation of Data.	The students can understand presentation of Data.
19. Measures of central tendency (Mean, mode and median) of given plant material.	The students can understand measures of central tendency (Mean, mode and median) of given plant material.
20. Calculation of Standard Deviation.	The students can understand the calculation of Standard Deviation.
21. Examples based on probability.	The students can understand and solve the examples based on probability.
22. Calculation of 't' test.	The students can understand and solve the calculation of 't' test.
23-24 Calculation of chi square test.	The students can understand and solve the calculation of chi square test.
25. Visit to breeding stations.	By breeding stations excursion analyze the students with an intense, but balanced overview of about research methodology.

Geography

Name of the Course	Course Outcome
B. Sc. I – Opt. Geography (Sem.-I Geomorphology) Paper No. I	**By the end of the course students will:** 1. Understand the effect of rotation of the Earth. 2. Understand interior structure of the earth 3. Learn the information of longitudes & latitudes 4. Understand the work of internal and external forces and their associated Landforms. 5. Learn the erosional and depositional land forms of Rivers and Wind etc. 6.Understand the application of geomorphology 7.Lern about origin of earth.
(Sem.-II Oceanography) Paper No. II	1. Understand the importance of Ocean. 2. Understand properties of ocean water & ocean floor. 3. Learn about effect of ocean Currents. 4. Understand about types of tides. 5. Learn about costal environment and Ocean Resources 6.Learn about ocean deposits & coral reef.
B. Sc. II– Opt. Geography	1.Be acquainted withthe relationship of man and environment.

(Sem.-III Biogeography) Paper No. V	2.Learn about biodiversity. 3. Understand the concept of H_2O cycle, Carbon Cycle, Nitrogen Cycle, etc. 4. Learn about importance of ecosystem. 5.Learn about biosphere. 6.Learn about food chain & food web. 7.Learn about Hot spots & threats to biodiversity.
(Sem.-IV Biogeography) Paper No. VII	1. Be acquainted the evolution of life. 2. Understand about plant & animal evolution. 3. Learn the basic concepts in Biogeography & Evolution of life Theories. 4. Understand the migration & Dispersal of plants and animals. 5.Be familiarized the various Environment protection laws. 6.Learn about renewable & non-renewable resources. 7.Learn about environment pollution
B.Sc - I (Sem.-I) **Paper: Geomorphology (Paper-2)**	1. Students will understood about Exogenous Processes considering weathering and mass wasting as well as its types 2. They will understood Evaluate the fundamental Model of Davisian Cycle of Erosion to learn the function offiver and its landforms development process. 3. Students will Understood formation, process and development of Fluvial and Krast Landforms 4. they will have recognize and understand the formation, process and development of Glacial andAeolian Landforms in geomorphology
B.Sc - I (Sem.-II) **Paper:Climatology** **(Paper - 4)**	1. They will Understood the difference between weather & climate and aims, nature, scope ofclimatology. 2. Students will Understood the composition and structure of atmosphere. 3. They will Getting facts about Heat Budget. 4. They will be Understood the concept of horizontal, vertical distribution of temperature and inversion of temperature. 5. They will have Identify the Atmospheric pressure and winds.
B.Sc – II (Sem.-III) **Paper: Soil Geography (Paper -6)**	1. Students will have Understood the nature, scope and concept of soil geography. 2. They will Understood physical and chemical properties of soil and factors affecting formation of soil. 3. They will Understood vertical structure of soil and soil

	horizon. 4. Students will Understand soil classification of USDA
B.Sc – II (Sem.-III) Paper: Agricultural Geography (Paper -8)	1. They will understood approaches of agricultural geography. 2. They will know the silent feature, problems of Agriculture. 3. Students will have Study about types of agriculture. 4. They will understood the role of irrigation 5. They will know the allied areas in agriculture and agriculture development.
B.Sc – I (Practical – I)	1. Students will have familiar with Physical Geographical data. 2. They will understood with different cartographic techniques. 3. Will have introduce the students Remote sensing and Arial Photography.
B.Sc – II (Practical – III)	1. Will have introduce basic principal of Toposheet (SOI) 2. They will identify the conventional signs and symbols of SOI toposheet. 3. They will understood the topographical maps, its introduction, types, index, grid reference, andinterpretation of topographical maps. 4. Will have introduce basic principal of surveying. 5. They will Study and understand the techniques of surveying, using Plane Table, Prismatic Composs and Abney Level Survey forpractical. 6. Students will the students with the geographical environment with the help of educational study tour.

Name of the Course	Course Outcome
B. Sc. I –Practical I - Annual Pattern (Name of Paper-Cartography)	1.Student familiar with Geographical climatic data. 2.To train the student with different graphic & diagramic techniques. 3.Learn about weather instruments. 4.Learn about Remote sensing & Satellites.
B. Sc. II– Practical II-Annual Pattern (Name of Paper-Practical Geography II-Remote sensing, Aerial	1.Introduce the important basic principle of remote sensing. 2.Learn about Stereoscope & Aerial photographs. 3.Learn about Interpret weather reports. 4. Learn about different statistical methods in geographical analysis.

photographs, Weather reports, Statistical methods & Computer)	5. Learn about Computer handling Skill & Construction of graph & diagram with the help of computer. 6.Introduce different sign & symbols used in IMD weather reports.
B. Sc. I –Practical I - Annual Pattern (Name of Paper-Cartography)	1.Student familiar with Geographical climatic data. 2.To train the student with different graphic &diagramic techniques. 3.Learn about weather instruments. 4.Learn about Remote sensing & Satellites.
B. Sc. II– Practical II-Annual Pattern (Name of Paper-Practical Geography II-Remote sensing, Aerial photographs, Weather reports, Statistical methods & Computer)	1.Introduce the important basic principle of remote sensing. 2.Learn about Stereoscope & Aerial photographs. 3.Learn about Interpret weather reports. 4. Learn about different statistical methods in geographical analysis. 5. Learn about Computer handling Skill & Construction of graph & diagram with the help of computer. 6.Introduce different sign & symbols used in IMD weather reports.

Course Outcome of the Certificate Courses (COs)

Name of the Course	Course Outcome
Communications Skills in English	1. The four skills of English language namely reading, writing, listening, and speaking of the students will have been improved. 2. They will have gained confidence to use English in day to day life. 3. They will be able to speak English more fluently and confidently. 4. The students' English vocabulary will have been increased. 5. The students will be able to express themselves in English with proper pronunciation. 6. The fear of English will have been removed from the minds of the students which is necessary to acquire command over English.
Travel and Tourism	1. The students will be able to understand the growing importance of tourism.

	2. The students will come to know about self-employment in tourism sector. 3. The students will come to know about tourist places in India and the world. 4. The students will be able to start a career as travel agent or become tourist guide
मुद्रित शोधन व शुध्द लेखन कौशल्य	१) विद्यार्थ्यामध्ये मुद्रितशोधक म्हणून काम करण्याची क्षमता निर्माण होईल. २) विद्यार्थ्यांचा भाषांतराचा दर्जा सुधारेल. ३) विद्यार्थी लेखन कौशल्य आत्मसात करतील.