DEOLA EDUCATION SOCIETY'S

KARMVEER RAMRAOJI AHER ARTS, SCIENCE AND COMMERCE COLLEGE, DEOLA DIST. NASHIK

Program Outcomes of the Institution

The graduate program provides the students advanced knowledge in the field of their concerned discipline also enables the students to acquire the basic skills required for carrying out curricular as well as extracurricular activities such as research, post graduation, recruitment in jobs etc. The program also provides them with adequate knowledge and skill to enhance their proficiency in the subject concerned. Similarly after completion of the program students can confidently prepare for post graduation, civil services and some other competitive examinations of their choice.

Summary of Programme Outcomes:

We offer undergraduate as well as post graduate programs under Faculty of Arts, Commerce and Science. For courses like B.A , B.Com & B.Sc the admission is provided on the basis of previous qualifying examination. After getting the admissions the students made aware of courses prescribed for the degree. We have 05 subjects in B.A at special level, 4 subjects in Science and 2 subjects in commerce. We have 3 subjects (Marathi, History and English) at PG level. Program outcomes represent the knowledge, skills and attitude of the students.

The objectives and importance of Course outcome, Program outcome and Program specific outcomes are communicated to the teachers and students in the formal way. Teachers enumerate the course outcomes in the respective classes at the undergraduate level. All the PG departments hold Orientation programmes to acquaint students with the course outcomes.

The outcome of BA/ B Com/B Sc Programs is:

- Community engagement and global understanding, Critical thinking, Communication skills, ethical values.
- Application of basic skills necessary for analysis of programs in Commerce and Economics.
- Demonstration and understanding of the local and the global contexts in which Science is practiced, addressing current issues like Climate Change, Sustainable Energy etc

College takes care of the attainment of above mentioned programs and follows the under mentioned methods of measuring attainments such as: Academic Calendar, Diary, Annual Teaching Plan, Result Analysis, Feedback, Placement etc.

The result analysis of last five years of above mentioned programs shows that the strength of the students as well as passing percentage of the students is increasing.

Our College takes utmost care of measuring the level of attainment of stakeholders. We follow formal and informal mechanism for the measurement of attainment of the outcomes. The College has outlined general Program Outcomes for the holistic development of the students.

- It provides support: Academic, Financial, Infrastructural to ensure the attainment of the Program outcomes like 'Capability of Independent learning, sense of civic responsibility, Environmental consciousness, Soft Skills and Life Skills, Leadership qualities and Teamwork, Quest for Excellence and Physical and Emotional Health'.
- The IQAC ensures that all departments set targets at the beginning of the term .The members of every department have to submit syllabus completion reports to their respective Heads.

The students give feedback on the teaching. This ensures free and honest feedback.

- The college in its pursuance of academic excellence has been successful in attaining certain Programme Specific Objectives.

Course Outcomes

- The course outcomes are achieved through systematic and extensive teaching by well qualified staff members.
- Remedial teaching is a regular feature, which is offered to the students in order to improve upon their academic performance.
- Adequate ICT facilities are made available to the students to help them keep pace with global knowledge.
- Continuous Internal Evaluation is part of the teaching-learning process.
- The term end and Semester examination results are quite satisfactory. The result analysis reflects the excellent performance of the students.

The specific outcomes are as follows:

Department of English

PROGRAMMES OFFERED, PROGRAMME OUTCOMES AND PROGRAMME SPECIFIC OUTCOMES DEPARTMENT OF ENGLISH

PROGRAMME: B.A. ENGLISH

Under Graduate Program Specific Outcomes: B.A. (English):

The graduates in Special English: Understand major and minor forms of literature.
 Have developed interest in literature and language
 Enjoy reading the short stories, poems, novels and dramas.

 Know the literary theories, terms and concepts in Criticism.
 Appreciate the literary works.
 Understand the structure and function of grammatical units.
 Know the use of language at semantic and syntactic levels.
 The students could improve vocabulary. Use English effectively in formal and informal situations.

 Know phonological and morphological aspects of English.
 Understand the values of literature in life.
 Understand different cultures of the times.
 Know various genres in English literature like Indian English literature, British
 Literature and American literature
Develop language learning skills like Listening,
Speaking, Reading and Writing.
 Develop vocabulary and communicative skills.

 Develop verbal and non-verbal skills of communication.
 Are able to get the jobs in industry, government, schools and offices
 Have enriched confidence to appear for competitive examinations

PROGRAMME OUTCOMES

PO-1: Glimpse of English Language Education in India during the later part of 18th century.
PO-2: Understanding the works of social reformists who have stirred the population on the topic like women's emancipation.

PO-3: Creating rational approach among the student to solve the social problems caused industrialization and the urbanization.
PO-4: Creating awareness of the past history of all the sections of the society.

PROGRAMME SPECIFIC OUTCOMES

PSO-1: Understanding the unique importance of English that has played a crucial role in building the modern India.
PSO-2: Students understand the different social contexts and individuals which in turn helps him to create the team spirit of working.
PSO-3: Students have deep care for the beauty of nature and the quality of natural environment and truly believes in sustainable development.
PSO-4: Students understands the real meaning and value of intellectual discipline.

DEPARTMENT OF ENGLISH PROGRAMME: M.A. ENGLISH

PROGRAMME OUTCOMES

PO-1: Students will learn about the decorative Western Movements in the form of visual arts, literature, theatre and music
PO-2: Students will learn various theories and principles from the Classical works of Greece.
PO-3: Analyzing the influence of Science and Technology rooted in the minds of 20th century writers. PO-4: Students get the awareness of the growth and liberation of human spirit of the time.

PROGRAMME SPECIFIC OUTCOMES M.A.

PSO-1: Students learns the choice of words to suggest a particular message to express his accumulation of ideas.
PSO-2: Students recognizes the exactness of the human problems like personal or professional, instantly without a question.
PSO-3: Twentieth Century makes students to develop self-control, zeal and persistence and the ability to motivate oneself.
PSO-4: Creative Writing enhances students how to draft, revise and edit the passage and to feel like a Journalist or an art dramatist.

COURSE OUTCOME OF UNDERGRADUATE LEVEL
COURESE OUTCOME F. Y. B COM OPTIONAL ENGLISH

• The students develop interest in literature.
• The students use their moral and social sense in life.
• The students are able to make special use of language for their expression.

COURESE OUTCOME OF F.Y.BCOM COMPULSORY ENGLISH

• The students are able to make accurate use of English Language in their respective fields.
• The students could communicate effectively in their various business situations.
• The verbal and non-verbal skills of communication are developed.

COURSE OUTCOME OF FYBA COMPULSORY ENGLISH

• **1)** The students could express themselves in oral and written communicative situations.
• 2) Students use the values learnt through literary works.

COURSE OUTCOME OF FYBA OPTIONAL ENGLISH

• Development of the comprehensive ability of students.
• Inculcation of moral and human values among students.
• Understanding of the basic forms of poetry.
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COURESE OUTCOME OF S.Y.B.A COMPULSORY ENGLISH

• The students' literary tendencies are developed.
• The students could express themselves in oral and written communicative situations.
• The students could improve vocabulary.
• The students are able to use English effectively in formal and informal situations of life**.**

COURESE OUTCOME OF S.Y.B.A ENGLISH General Paper -2 (Introduction to Study of English Language and Literature)

• The students are able to appreciate literature critically.

• The students could use their creative and critical faculties of mind in real life situations.
• The learners are able to apply the science of pronunciation and oral form of English language.
• The students use literature to develop their social and moral sense in life.

• COURESE OUTCOME OF S.Y.B.A ENGLISH Special Paper -I

• The students learn to correlate literature to socio-political conditions of its time.
• The students are able to use their creative and critical faculties of mind in real life situations.
• The learners could implement the values of literature in life.

COURSE OUTCOME OF S.Y.B.A ENGLISH Special Paper -II,
• Students could learn Language through literature.
• The syllabus can implement the values of literature in life.
• Students know the culture of the times.

COURSE OUTCOME OF T.Y.B.A ENGLISH Compulsory English
• The students understand the basic concept of literary genre, poem, prose and stories.
• To help the students to develop literary abilities.
• The students' communicative skills are developed.

COURSE OUTCOME OF T.Y.B.A. ENGLISH Special English-G-III
• The students learn the origin of drama and dramatic art.
• The students learn the aspects and genres of drama.

COURSE OUTCOME OF T.Y.B.A. ENGLISH Special Paper-III
• The students develop the critical understanding literature.
• The students are exposed to Indian writing in English and American literature.
• The students are exposed to social, political and cultural background.

COURSE OUTCOME OF T.Y.B.A. ENGLISH Special Paper-IV
• The students understand the properties and functions of language.
• Inculcation of phonological competence among students.
• The students are acquainted with English grammatical forms and functions.
• The students are acquainted with morphological concepts and processes.
• The students are acquainted with the basic concepts in syntactic and semantic levels of language.

COURSE OUTCOME OF POST GRADUATE LEVEL
COURESE OUTCOMS OF M.A. (I) CORE PAPER ENG

Contemporary studies in English language

• The students are well acquainted with the nature of human language.
• The students are familiarized with the recent trends.
• The students develop the stylistic competence for analyzing literary texts.

COURSES OUTCOMES OF M.A. (I) CORE PAPER ENG: POETRY IN ENGLISH

• Students are acquainted with the language, poetic style, and diction of the age to which it
belongs
• Students learn values through literary works.

COURESE OUTCOMES OF M.A. (I) CORE PAPER ENG: -DRAMA IN ENGLISH

• Students get the knowledge of the theatre of the times
• Students are acquainted with the language, style, dialogue structure of the age to which it
Belongs
• Students learn values through literary works.

COURESE OUTCOMES OF M.A.II
INDIAN WRITING IN ENGLISH

• The students develop interest in different genres in Indian writing in English.
• Make the student aware regarding of social, political, and cultural issues reflected in Indian writing in English

COURESE OUTCOMES OF M.A. (II), - CORE PAPER ENG- Literary Theory and Criticism

• Students get the knowledge of critical theories.
• Students think over the theories, in effect appeal to logic and analytical capacity.
• The knowledge of the critics.

COURESE OUTCOME OF M.A. (II)- CORE PAPER ENG- DRAMA IN ENGLISH

• Students get the knowledge of the culture of the times.
• The study of fiction helps students to learn human values.
• The knowledge of the behavioral patterns from great works of art.

COURESE OUTCOMES OF M.A. (II) CORE PAPER ENG- ENGLISH LANGUAGE AND LITERATURE TEACHING

• Students understand the important of aspects English language and literature teaching.
• Students learn the concepts like curriculum, lesson plan, effective teaching method and evaluation.
• Students keep pace with new technology and its role ELLT.

COURESE OUTCOME

M.A (II)English language and Literature teaching

• The student let know about English language and Literature
• Students are able to learn language through literary works

Program Outcomes of Marathi

Bachelor of Arts (B.A.)

After completion of the programmers, the students will develop ability:

1. To understand knowledge in the field of Arts and Social Sciences.

2. To be Honest, cultured and good citizens with social consciousness.

3. To get earning opportunities through employment and self-employment.

4. To understand fundamental Human values. 5. To improve communication and soft skills. 6. To make all round personality development.

Programs Specific Outcome

After completion of the programmers, the students will develop ability:

1. To acquire the facility in the use of Marathi language

2. To make use of Marathi for creative writing

3. To improve their skill of reading Marathi

4. To use the standard and colloquial Marathi for communication

5. To produce valuable knowledge in Marathi

Course outcomes

FYBA- Marathi literature:Story and language skills development.(sem-I)

1) The story introduced this type of literature

2) The story introduces the elements and forms of this literary genre.

3) In various material streams stories studied selected stories in this literary genre

4) Developed various linguistic skills

FYBA- Marathi literature:Playwrightand language skills development.(sem-II)

1) The playwright introduced this type of literature
2) The one-act play introduces the material elements and types of this type of literature
3) Studied selected one-act plays in Marathi literature
4) Developed various linguistic skills

SYBA-G-2-Modern Marathi literature and applied Marathi.

1) Students were introduced to spelling.
2) The term gold was introduced.
3) Charitra - Atmacharitra gave knowledge of the philosophical phenomena of this literary genre.

4) Students developed the ability to appreciate and evaluate selected topics in the textbook.

SYBA-S-1- Various literary genres in Marathi literature.

1) Explained to the student's various literary types of Marathi literature and their features.
2) The vision of evaluating the taste of literature was created.
3) Literary type tastes developed.
4) The ability to study literature at a microscopic level was created.
5) Preparations were made for the study of Marathi literature.

SYBA- S-2:History of modern Marathi literature (1818 te 1960)

1) Special level students were introduced to the historical traditions of Marathi literature.
2) The inspirational tendencies of literature of a particular period were introduced.
3) Introduction to literary genres such as stories, poems, novels, plays, essays, characters, autobiographies.
4) Overall, he explained the history of modern Marathi literature from 1818 to 1960.

T.Y.B.A.- G-3:Modern Marathi literature and practical and applied Marathi.

1) Introduced modern literature.
2) Developed an interest in literature and developed the ability to enjoy art.
3) The ability to comprehend language was created.
4) Essays and travel descriptions explained the philosophical interpretation of this literary genre.
5) Introduced text examination by developing students' reading, listening and writing skills.

T.Y.B.A.-S-3:Literary Thought.

1) The purpose of the literature explained the process of making the language taste process.
2) An interest in literature was created.
3) Explained the nature of the literature.
4) Explained the interrelationship between literature and society.
5) Explained the overall literary value.

T.Y.B.A.- S-4: Linguistics-Descriptive and historical.

1) The nature of the language explained the importance of the study of diversity and the major components of the study of language.
2) Students explained the function and importance of language in human life.
3) Tone is in the process of formation and the students were introduced to the science format system sentence and semantic thinking.
4) Importance of Historical Language Studies The concept of linguistics was introduced.
5) The students understood the origin of Marathi language and the journey of the family in the language of that time.

F.Y.B.COM.-Gen-Language, Literature and Skill Development (sem-I)

(Textbook-Utkarsh Vata.)

1) Utkarsh Vata explained the importance of this by explaining the stories in the textbook
2) The nature and necessity of language communication in the Marathi region was explained.
3) Developed skills in the use of various regional Marathi languages.
4) Developed skills to use various Kshatriya Marathi languages.
5) He nurtured moral, professional and ideological values in the students.

F.Y.B.COM. - Gen-Language and Skill Development (sem-II)

1) The nature and necessity of language communication in the Marathi region was explained.

2) Developed skills in the use of various regional Marathi languages.
3) Developed skills to use various Kshatriya Marathi languages.
4) He nurtured moral, professional and ideological values in the students.
5) Enabled to study different writing types and use actual writing skills.

S.Y.BSc.-Gen-Marathi –

Viddnyansrushti: Textbook and practical and applied Marathi.

1) Students became interested in Marathi science literature
1) 2)Awareness about Marathi science was created among the students.
2) Various stream opportunities in the field of science and industry were introduced.
3) Linguistic skills were developed among the students.
4) From the textbook, science articles studied the character of science scientists and science fiction.

P. G. Programs Outcome

M. A. in Marathi After completion of the course, the students will develop ability:

1. To acquire the facility in the use of Marathi language

2. To make use of Marathi for creative writing

3. To improve their skill of reading Marathi

4. To use the standard and colloquial Marathi for communication

5. To produce valuable knowledge in Marathi

Programs Specific Outcome

M.A. -Part-I & II

1) Advanced knowledge of Marathi language and literature.
2) Literary and life awareness developed.
3) Encouraging students' writing skills, they developed the ability to study medicine.
4) The author's literary work was meticulously studied.
5) It became possible to study the ancient medieval modern Indian and Western thought on the subject of literature.

6) Students developed the ability to review literature.
7) Writing Editing Writing Knowledge Translation Transformation Learn this process.

Course outcomes

M.A.(Marathi) Part-I

1) Linguistics and Linguistic Skills Part 1,2

1) Can write good and accurate letters.
2) will help in office correspondence.Precision can be brought in the organization of.
3) public events.
4) Communication will be easy.
5) The importance of punctuation will be understood.

2)History of Marathi Literature(1818 to 1920).

1) Understanding the changing nature of modern Marathi literature.
2) The contribution of transformation in literature will be understood.
3) Exploring the modernization of literature.
4) The concept of literary history will be understood.
5) The effects of the freedom movement on Marathi literature will be noticed.

3)Historical linguistics.

1) The movement of Marathi language will be noticed.
2) Misconceptions about dialect will disappear.
3) A new way of looking at one's own language will develop.
4) The nature of linguistic transformation will be understood.
5) There will be knowledge of linguistic concepts.

4)Rural Literature.

1) The concept of rural literature will become clear.
2) The uniqueness of Marathi rural literature will be noticed.
3) A vision will be developed on how to study rural literature.
4) The rural literature movement will be understood.
5) The writings of important rural writers will be introduced.

5)Dalit Literature.

1) Dr. The influence of Babasaheb Ambedkar's personality on Marathi literature will be noticed.

2) A new way of looking at literature will develop,
3) A new understanding of thinking and literary dealings will come.

4) The movements that have taken shape from Dr. Ambedkar's philosophy will come to light.
5) Abedkari literature will be studied.

M.A.(Marathi) Part-II

1)Media and Literature.

1) The importance of periodicals will be noticed.
2) The contribution made by the periodicals to Marathi literature will be known.
   3. The format of the magazines will come to mind.
3) The work of the periodicals will be noticed.
4) The movement of selected journals will be known.

2)Literature:Review and Research.

1) Students will be able to understand critical thinking.
2) Students will be introduced to important critics in Marathi.
3) Students will get a new perspective on literature.
4) The relationship between literature and other arts will be noticed.
5) Will introduce various review methods.

3)Special Author's Study (Medieval /Modern)

1) Understanding the contemporaneity of an author's literature.
2) The contribution of ex. Aruna Dhere's literature will be known.
3) The nature of ex. Aruna Dhere's literature will be noticed.
4) The author will know how to study.
5) The social environment and the author's contract will be understood.

5) Fundamentals of Folklore and Marathi Folklore

1) The vision of studying and compiling folklore will be developed.
2) will introduce the folklore of the development of human culture.
3) Marathi folklore will be introduced,
4) Marathi folklore will be collected.
5) Marathi folk drama will be introduced.

Hindi Department

Program Outcomes

PART-I Hindi Paper I, Paper II and Paper III Students can work anywhere in India, as they know Hindi - Our National Language. In many other countries also, Hindi is used as an Official Language as well as second Language. So they can easily be employed easily in those countries also. As they are Practicing Translation from Hindi to English and English to Hindi and some other Languages as well, they can become Translators in many Central Govt. Offices. They are learning Poetry and Grammar -so they can become creative writers or poets are authors. By Reading and observing Drama's and one act plays they can become good actors. By having good communication skills and command over language one can becomes good speaker. Having good command over particular language one can present himself in better way. Learning Hindi in non-Hindi region definitely one can achieve anything.

CSO.

FYBA Hindi General Paper-1 (G1)

1. Introducing Hindi Poetry to the students
2. To provide information about Hindi poetry
3. To develope the communication skill by Hindi language
4. To create interest in students about basic Hindi writing
5. To develope Skill of advertisement among the student.
6. To give information about translation.
7. To give information about software in Hindi language.
8. To develope Skill of essay writing.

SYBA Hindi General Paper-2 (G2)

1. Acquire ability to appreciate stories, poems and plays in Hindi.
2. Understand various genres in Hindi literature.
3. Get acquainted with the socio-political contexts of various Hindi writers.
4. Understand nationalistic values through the study of Hindi literature.

TYBA Hindi General Paper-III (G-3)

1. Get acquainted with literary critical terminology used in Hindi language.
2. Augment translation skill of various types of texts from different languages.
3. Acquire skills of drafting official and scientific documents in Hindi.

Programme:B.A. Economics

Objectives of the course:

1. To provide in depth knowledge of socio-economic aspects.
2. To familiarize with current and recent developments in Economics
3. To enrich knowledge through problem solving, hands-on activities projects.
4. To provide a broad and comprehensive knowledge in micro and macro Economics, Public Economics, Indian Economy and Agricultural Economics.
5. To develop analytical abilities towards real world problems

Programme Specific Outcome:

1. After completion of program, students will be able to have in-depth knowledge of basic concepts in Economics.
2. A good academic background to be able to seek admission for masters degree in Economics
3. An academic background to be able to crack the baning and administrative examinations

F.Y.B.A.
Indian Economic Environment

Objectives of the course:

1. To familiarize the students with the recent developments in the Indian Economy.
2. To provide the students with the background of the Indian Economy with focus on Contemporary issues like economic environment.
3. To help the students to prepare for varied competitive examinations.
4. To enable students to understand and comprehend the current business scenario, agricultural scenario and other sectorial growth in the Indian context. To make the student aware of the developments such as MSMEs, Digital Economy, E-Banking, BPO & KPO, etc.

Programme Outcome:

1. Ability to develop an understanding of the economic environment and the factors affecting economic environment.
2. Ability to develop awareness on the various new developments in the different sectors of an economy – agriculture, industry, services, banking, etc.
3. Ability to compare and contrast Indian Economy with other world economies.
4. At the end of the course, the student should be able discuss and debate on the various issues and challenges facing the Indian Economic Environment

S.Y.B.A..
G-2: Modern Banking

Objectives of the course:

1. To create the awareness among the students of Modern Banking System.
2. Banking constitutes important components towards understanding of economics.
3. Clear understanding of the operations of banking.

Course Outcomes:-

1. Students will be getting awarded with the Modern Banking System.
2. Students will be familiar with Banking constitutes important components towards understanding of economics.
3. After completion of program, students will be able to have in-depth knowledge of the operations of banking their interaction with the rest of the economy.

S.Y.B.A.
S-1: Micro Economics

Objectives of the course:

1. In this course, student is expected to understand the behavior of an economic agent, namely, a consumer, a producer, a factor owner and the price fluctuation in a market.
2. The chapter incorporated in this paper deal with the nature and scope of economics, the theory of consumer behavior, analysis of production function and equilibrium of a producer, the price formation in different markets structures and the equilibrium of a firm and industry.
3. In addition, the principles of factor pricing and commodity pricing as also the problems of investment and welfare economics have been included.

Course Outcomes:-

1. As a foundation course, in this paper, student is expected to understand the behavior of an economic agent, namely, a consumer, a producer, a factor owner and the price fluctuation in a market.

S.Y.B.A.
S-2: Macro Economics

Objectives of the course:

1. To familiarize the students the basic concept of Macro as well as methodological contents.
2. On account of the growing influence and involvement of the State in economic fields, macro-economic has become a major area of economic analysis in terms of theoretical, empirical as well as policy making issues.

3. Macro economics has an extensive, substantive as well as methodological content. It deals with the functioning of the economy as a whole.
4. To aware the basic theoretical framework underlying the field of Macro-economics

Course Outcomes:-

1. After completion of program, students will be able to have in-depth knowledge of on account of the growing influence and involvement of the State in economic fields, macro-economic has become a major area of economic analysis in terms of theoretical, empirical as well as policy making issues.
2. Students will be familiar with Macro economics has an extensive, substantive as well as methodological content.
3. Students will be getting acquainted with the functioning of the economy as a whole, including how the economy's total output of goods and services and employment of resources is determined and what causes these totals to fluctuate.
4. Student get awarded of the basic theoretical framework underlying the field of Macro-economics.

T.Y.B.A.

G-3: Economic Development and Planning

Objectives of the course:

1.To gained importance because of stained interest of the developing countries in uplifting their economic conditions by restructuring their economics.

2. To acquire greater diversity, efficiency and equity in Consonance with their priorities. While few success stories can be counted, many have grappled with chronic problems of narrow economic base, inefficiency and low standard of living.

3. In recent times, besides hard core economic prescriptions to development, concern hitherto relegated to background, like education, health, sanitation and infrastructural development, have found place of pride in explaining the preference of various economies incorporated in this paper are devoted to the theories of economic development, approaches to economic development, social and institutional aspects of development, constraints on development process, macroeconomic policies, roll of foreign capital and economic planning etc. in developing countries.

Course Outcomes:-

1. Students will be familiar with Economic Development has gained importance because of stained interest of the developing countries in uplifting their economic conditions by

restructuring their economics to acquire greater diversity, efficiency and equity in Consonance with their priorities.

2. Students will be acquainting the basic concepts of this and other reasons; there have been many approaches to economic development.

3. After completion of program, students will be able to have in-depth knowledge of, recent times, besides hard core economic prescriptions to development, concern hitherto relegated to background, like education, health, sanitation and infrastructural development, have found place of pride in explaining the preference of various economies incorporated.

T.Y.B.A.
S-3: International Economics

Objectives of the course:

1. This course provides the students a thorough understanding and deep knowledge about the basic principles that tend to govern the free flow of trade in goods and services at the global level.

2. The contents of the Paper spread over various modules, lay stress both on theory and applied nature of the subject that have registered rapid changes during the last decade.

3. Besides this, the contents prepare the students to know the impact of free trade and tariffs on the different sectors of the economy as well as at the macro level.

4. The students would also be well trained about the rationale of recent changes in the export import policies of India.

Course Outcomes:-

1. Students will be get acquainted with the understanding and deep knowledge about the basic principles that tend to govern the free flow of trade in goods and services at the global level.

2. After completion of program, students will be able to have in-depth knowledge of the contents of the Paper spread over various modules, lay stress both on theory and applied nature of the subject that have registered rapid changes during the last decade.

3. Students will be get acquainted with the contents prepare the students to know the impact of free trade and tariffs on the different sectors of the economy as well as at the macro level.

4. Students will be getting acquainted with the rationale of recent changes in the export import policies of India.

T.Y.B.A.
S-4: Public Finance

Objectives of the course:

1. Role and functions of the Government in an economy has been changing with the Passas of time.
2. To understand the basic problems of use of resources, distribution of Income, etc.
3. To aware vast array of fiscal institutions -tax systems, expenditure programs budgetary procedures, stabilization instruments, debt issues, levels of government, etc., which Raise a spectrum of issues arising from the operation of these institutions.
4. Further, the existence of externalities, concern for adjustment in the distribution of income and wealth, etc. require political processes for their solution in a manner which combines individual freedom and justice.

Course Outcomes:-

Students acquainting knowledge of Role and functions of the Government in an economy has been changing with the Passas of time.

Programme:B.Com.

Objectives of the course:

1. To developing tomorrow's leaders, managers, and professionals.
2. To meet the growing needs of the business society, there is greater demand for sound development of commerce education.

Programme Specific Outcome:

1. Commerce education is that area of education, which develops the required knowledge, skills and attitudes for the handling of Trade, Commerce and Industry.
2. Commerce education is entirely different from other disciplines. Hence, it must charter Course routes to service the aspirations of the nation.
3. The relevance of commerce education has become more imperative, this means a marked change in the way commerce and management education is perceived in India.

F.Y. B.Com.

Business Economics (Micro) (Compulsory Paper)

Objectives of the course:-

1. To impart knowledge of business economics
2. To clarify micro economic concepts
3. To analyze and interpret charts and graphs
4. To understand basic theories, concepts of micro economics and their application

Course Outcomes:-

1. Students will be get acquainted with the basic micro economic concepts and inculcate an analytical approach to the subject matter.
2. Students will be acquainting the basic concepts of the relevance & use of various economic theories.
3. After completion of program, students will be able to have in-depth knowledge of economic reasoning to problems of business

F.Y. B.Com.
Banking and Finance (Optional Paper)

Objectives of the course:-

1. To provide knowledge of fundamentals of Banking.
2. To create awareness about various banking concepts.
3. To conceptualize banking operations.

Course Outcomes:-

1. Students acquainting the basic concepts of bank and Banking.
2. Students will be able to have in details knowledge of modern Banking business.

S.Y.B.Com. 2014 Annual 80:20 pattern
Business Economics (Macro) (Compulsory Paper)

Objectives of the course:-

1. To familiarize the students the basic concept of Macro Economics and application.
2. To study the behavior of the economy as a whole.
3. To study the relationship among broad aggregates.
4. To apply economic reasoning to problems of the economy.

Course Outcomes:-

1. Students will be getting acquainted with the basic concept of Macro Economics and application.
2. After completion of program, students will be able to have in-depth knowledge of behavior of the economy as a whole.
3. Students will be acquainting the basic concepts of the relationship among broad aggregates.
4. Students will be familiar with apply economic reasoning to problems of the economy.

T.Y.B.Com. 2015 Annual 80:20 pattern

Indian and Global Economic Development (Compulsory Paper)

Objectives of the course:-

1. To expose students to a new approach to the study of the Indian Economy.
2. To help the students in analyzing the present status of the Indian Economy.
3. To enable students to understand the process of integration of the Indian Economy with other economics of the world.
4. To acquaint students with the emerging issues in policies of India's foreign trade.

Course Outcomes:-

1. Students will be getting acquainted with the knowledge about globalization, privatization and liberalization.
2. After completion of program, students will be able to have in-depth knowledge of World economic situation.
3. Students will be acquainting the basic concepts of the relationship with modern world and Indian economy.
4. Students will be familiar with apply economic reasoning to problems of the Indian economy.

•PROGRAM SPECIFIC OUTCOMES: BA History

On completion of the M.A. (History), students are able to:

1**. Jobs in Government**: policy analysts, government historians, intelligence analysts, museum curators, administrative and programs specialists, communication specialists, and corporate communication managers.

2. **Travel and Tourism Expert**: Work as a tourist guide at historical and religious places.

3. **School Teacher**: Work as a teacher in schools and high schools

4. **College Teacher**: Work as a assistant professor in colleges

5. **Archivist**: A history graduate can find employment with Archaeological Survey of India or with private firms related to archaeology.

6**. Researcher**: Many Government and non-government institutes along with research center offer several career options for qualified geographers with numerous specializations.

7. **Competitive Examinations**: For History graduates, the option of public service and NET/SET is always open. 8. Social Work: NGOs and Social Welfare Organizations also employ BA History graduates.

10. **Writer/Subject Matter Expert**

11. **Journalist:** Journalism is a common career for History graduates.

COURSE OUTCOMES: B.A. History

F.Y.B.A. History General -1 (1177)

Chh. Shivaji and His Times (1630 to 1707)

1. Students got knowledge of concept of Shivaji and his times.

2. Student view increased of Nationalism and Secularism.

3. Students got knowledge of administration of ShivajiMaharaj.

4. Introduced to student social, economic and religious condition.

S.Y.B.A. History General - 2 (2177)

Modern India (1857-1950)

1."History of Modern India" topic as a part of History is a very important section as far as the Syllabus of any competitive examination is possible, especially Civil Services exams.

2. Students understand of the stages of development in Modern India, why certain events happened and analysis of the consequences of such developments that paves an impact on our society, economy and our political system.

3. Modern Indian history Importance For competitive examination.

History Special- 1 (2178)

Ancient India (3000B.C. to 1260AD.)

1. Ancient Indian history is very importance for UPSC Examination.

2. When students doing study of ancient Indian history that time they know about original culture religion and society.

3. Increasing student‟s wideness. 4. Student capable for discuss any Social issue.

History Special – 2 (2179)

History of Modern Maharashtra (1818-1960)

1. Students got knowledge of concept History of modern Maharashtra.

2. Modern Maharashtra history is useful to student for MPSC examination.

3. National and social movement in Maharashtra Introduced to students.

4. Student got knowledge of Maharashtra Philosophers and their philosophy

T.Y.B.A. History General - 3 (3177)

History of the World in 20th century

1. Students got knowledge of concept in world history.

2. Students got global event knowledge it is use for increased intellectual level.

3. World trend of thinking, Marxist, Communalism, Dictatorship, Empearalism,Nazizum, fascism, Terrorism, Feminism, Globalization, etc introduced to Students.

History Special - 3 (3178)

Introduction to History

1. Students known source of history.

2. Practically student known to how much write history.

3 Increased the knowledge of research in history

4. Students know external and internal Criticism.

5 Students know historian works.

History Special - 4 (3179)

History of Asia in 20th Century

1. Students know history of America.

2. Concept of American history introduced to Students

3. Students know causes of Great Depression and policy of New Deal and Fear Deal.

4. Students know American politics in world.

5. Students got knowledge of international relation with America

PROGRAM OUTCOMES: MA History

•Students enable to adequate conceptual base of history and better understanding ofHistory and its forces, Students enable to research in terms of form formulating hypotheses and develop broadframes of interaction with other social sciences and attain certain level of interdisciplinary approach. Students understanding the social, economic and institutional bases of Ancient India.

- Students enable to understanding the Ancient Indian history.

- Students enable to understand historical materials efficiently and effectively integrate and use of historical information to accomplish a specific purpose. Students understand cultural, ethical, social, legal, and economic issues history

•PROGRAM SPECIFIC OUTCOMES: MA History

On completion of the M.A. (History), students are able to:

1**. Jobs in Government**: policy analysts, government historians, intelligence analysts, museum curators, administrative and programs specialists, communication specialists, and corporate communication managers.

2. **Travel and Tourism Expert**: Work as a tourist guide at historical and religious places.

3. **School Teacher**: Work as a teacher in schools and high schools

4. **College Teacher**: Work as a assistant professor in colleges

5. **Archivist**: A history graduate can find employment with Archaeological Survey of India or with private firms related to archaeology.

6**. Researcher**: Many Government and non-government institutes along with research center offer several career options for qualified geographers with numerous specializations.

7. **Competitive Examinations**: For History graduates, the option of public service and NET/SET is always open. 8. Social Work: NGOs and Social Welfare Organizations also employ BA History graduates.

10. **Writer/Subject Matter Expert**

11. **Journalist:** Journalism is a common career for History graduates.

COURSE OUTCOMES: M.A. History

M.A. History Part-I (Sem.-I)

HS - Core Course- 1 History and its Theory

1. Students got knowledge of History writing theory.

2. History writing trends in the world introduced to students.

3. Students get helped to research in terms of formulating hypotheses and develop broad frames of interaction with other social sciences and attain certain level of interdisciplinary approach

HS -Core Course- 2 Evolution of Ideas and Institutions in Ancient India

1. Students understand of the social, economic and institutional bases of Ancient India.

2. It is based on the premise that an understand of Ancient Indian history is crucial to understand Indian history as a whole.

HS – Core Course- 3 Maratha Polity

1. Students understand administrative system of the Marathas in an analytical way,to acquaint the student with the nature of Maratha Polity.

2. Students understood basic components of the Maratha administrative structure, to enable the student to understand the basic concepts of the Maratha polity.

HS -Optional Course- 1 Cultural istory of Maharashtra

1. Students know relatively neglected part of social history; it is an attempt to provide voice to the history of the oppressed.

2. It defines and provides understand of various concepts, further explains the caste system and evil practices like untouched ability and its rigidification in ancient and medieval times.

3. Students get knowledge of it lays emphasis on the earlier forms of protest byBuddhism, Jainism and later by Bhakti movement, in the medieval period especially in Maharashtra,

4. Students know that, which lays the foundation for social awareness and renaissance of the per Ambedkarian period.

M.A. History Part-I (Sem. - II)

HS -Core Course- 4 History and its Practice

1. To helped student interrogate existing paradigms and challenge the outdated.

2. To helped students in developed critique.

3. To helped student help research in terms of formulating hypotheses and developed broad frames of interaction with other social sciences and attain certain level of Interdisciplinary approach.

HS- Core Course- 5 Evolution of Ideas and Institutions in Medieval India

1. Student introduced nature of medieval Indian society, economy, state formations, and the main religious currents of the time.

2. It is seen as a continuation of the course on ancient India. Students understand of the nature of society, and the problems of the challenge to that society, through colonialism, at a later stage.

HS Core Course- 6 Socio –economic History of the Maratha

1. Students were the components of social structure and their functions, to understandthe relationship between religion, caste, customs, traditions, class in 17th and 18th century Maratha Society,

2. To enable the student to understand aspects of economic life, to trace the determinants of changes in social and economic life.

HS – Core Optional Course- 7 Marathas in 17th and 18th century Power Politics

M.A. History Part-II (Sem.-III)

HS –Core Course- 7 Ancient and Medieval Civilization of the World

1. Ancient and Medieval cultures with a view to understand the students,

2. Students were known reinterpret and present them in historical perspective.

3. Student to understand intellectual trends in the modern world to enable the student to have a better understand of Indian History in the World context.

HS- Core Course- 8 Debates in Indian History

1. Students introduced the student to some of the issues that that have been debated by historians and to introduce some perspectives with reference to Indian History.

HS- Core Course – 9 Economic History of Modern India

1. Student understands to structural and conceptual changes in Indian economy after coming of the British.

2. Students were awareness of the exploitative nature of the British rule,

3. Students understand the process of internalization by Indians of new economic ideas, principles and practices.

HS-Core Optional Course- 13 Maharashtra in the 19th Century

1. Student knows the history of modern Maharashtra from an analytical perspective; to point out to them the dialectical relationship between continuity and change in Maharashtra.

2. Students understand the ideas, institutions, forces and movements that contributed to the structural changes in Maharashtra.

3. Students understand various interpretative perspectives. To helped them in articulating their own ideas and views leading to orientation for research.

4. To introduced the student to regional history within a broad national framework

M.A. History Part-II (Sem.-IV)

HS –Core Course- 10 History of Modern India (1857 -1971)

1. Students understood the history of „Modern" India in an analytical perspective.

2. To made them awareness of the multi-dimensionality of Modern Indian History.

HS – Core Course-11 Intellectual History of the Modern West

1. Students were understand the concepts that are used in history, both of west Europe and India; to acquainted the student with the intellectual activity that played an important role in shaping events; the transition from medieval to modern times.

HS Core Course- 12 World after World War II (1945 – 2000)

1.To acquainted the student with the post-World War II scenario and to enable them to understand contemporary world from the historical perspective.

HS Core Optional Course- 19 Maharashtra in the 20th Century

1. To enabled the student to study the history of modern Maharashtra in an analytical perspective; to point out to them the dialectical relationship between continuity and change in Maharashtra.

2. Students were understood ideas, institutions, forces and movements that contributedto the transformation in 19th century Maharashtra.

3. To acquainted the student with various interpretative perspectives.

4. To helped them in articulating their own ideas and views leading to research orientation. 5. To introduced the student to the regional history within a broad national framework.

Geography

Programme Outcomes

After successfully completing B.A. Geography Programme students will be able to:

PO1: Apply qualitative and quantitative research techniques to gather and analyse data on social, cultural, and ecological problems.

PO2: Apply clear written and oral communication skills to communicate results of research.

PO3: Demonstrate connections between everyday life at the local scale and the larger economic, social, and/or environmental forces that network them into a global community.

PO4: Evaluate cultural, social, and environmental processes with a particular focus on space and place, critical theory, practical application, analysis and/or social justice.

PO5: Think in spatial terms to explain what has occurred in the past as well as using geographic principles to understand the present and plan for the future.

PO6: Present completed researches, including an explanation of methodology and scholarly discussion, both orally and in written form and, wherever possible, utilize cartographic tools and other visual formats.

PO7: Demonstrate general understanding of how the physical environment, human societies, and local and global economic systems are integral to the principles of sustainable development.

PO8: Demonstrate acquisition of Weather chart/map, map aerial photograph and Image reading skill.

PO9: Apply Remote sensing concepts, techniques and their application.

PO10: Develop research questions and critically analyse both qualitative and quantitative data to answer those questions using various theoretical and methodological approaches in both physical and human geographies.

PO11: Develop a general understanding of global human population patterns, factors influencing the distribution and mobility of human populations including settlement and economic activities and networks, and human impacts on the physical environment.

PO12: Read, interpret, and generate maps and other geographic representations as well as extract, analyse, and present information from a spatial perspective

Programme Outcomes

After completing B. A. Geography programme will have

PSO1: Demonstrate and understanding of principles and theories of Geography. This include Geomorphology, Economic Geography, Human Geography, Agriculture Geography.

PSO2: Apply Statistical Techniques of Spatial Analysis.

PSO3: Demonstrate ability to apply knowledge learned in classroom to set and perform simple laboratory experiments in geography.

Course Outcomes

F.Y.B.Sc. (Geography)

Course No : Gg 111 Introduction to Physical Geography–I (Geomorphology) Semester I

The student who successfully completes this course can able to:

CO1: Explain principal terms, definitions, concept and theories of Geomorphology.
CO2: Discuss how different scales of time and space affect geomorphological processes and the development of micro to mega scale landforms.
CO3: Explain different concept, theories and models for landscape evolution.
CO4: Describe the exogenous and endogenous processes in the landscape, their importance in landform development, and distinguish the mechanisms that control these processes.
CO5: Describe the different Materials of the earth crust, rock types, types of weathering, mass movements and types of slope.
CO6: Apply knowledge of basic landforms from tectonic, volcanic, fluvial, glacial, Aeolian and coastal environments.

Course No : Gg 112 Introductionto Physical Geography II (Geography of Atmosphere and Hydrosphere) Semester I

The student who successfully completes this course can able to-

CO1: Explain principal terms and concept of Climatology.
CO2: Describe composition and Structure of Earth Atmosphere
CO3: Explain electromagnetic spectrum, its effect on earth atmosphere and types of insulation.
CO4: Explain basic concepts of air temperature, air pressure and its measurement. CO5: Explain basic concepts of wind and wind measurement.
CO6: Describe scales of Atmospheric Motion and Models of air circulation.
CO7: Explain basic concepts of hydrological cycle, condensation and evaporation.
CO8: Describe concept of Lapse Rate, Stable and unstable Atmosphere, Air Masses & Fronts.

Course No. Gg. 113 Practicals: Practicals in Physical Geography Paper III Semester I

After successfully completing this course, students will be able to: CO1: Explain basic concepts of map and scale.
CO2: Identify different Types of Map Projections.
CO3: Describe basic of Statistical data and the skill of graphical data representation.

Course no : Gg 121 Introduction to Human Geography Paper IV Semester II

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

CO1: Describe nature of man-environment relationship and human capability.
CO2: Explain conditions of living of human beings from primitive life to the modern era.
CO3: Explain human evolution and different races existed since the beginning of living life.
CO4: Describe different tribes and their culture in different geographical areas. CO5: Explain causes and effect of migration of mankind.
CO6: Analyse relationship between population and available resources.
CO7: Identify and explain spatial distribution pattern of population and environment CO8: Identify contemporary issues which the global community is facing.

Course no : Gg 122 Population and Settlement Geography Paper V Semester II

The student who successfully completes this course can able to:

CO1: Explain Evaluation of settlement and population geography globally. CO2: Describe factors influencing growth and distribution of settlements. CO3: Identify various patterns of settlement using topo sheet.
CO4: Evaluate effects of technology on shelter and pattern of settlement. CO5: Analyze factors influencing the dispersion and nucleation.
CO6: Measure degree of dispersion and nearest neighbour using Toposheet.
CO7: Apply concepts of Nodality, Centrality, Range, Threshold and Hierarchy to describe the features of settlement.
CO8: Analyse factors responsible for urbanization and influencing the distribution of settlement globally.

Course No. Gg:123 Practicals in Human Geography Semester II Paper VI

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

CO1: Describe underlying theory and concepts of experiments in course.
CO2: Calculate agricultural efficiency and analysis of methods, network structures, Lorenz curve and location quotient, logarithmic graph papers, child women ratio, age sex pyramid & dependency ratio, infant mortality rate and age specific mortality and population growth rate and population projection.
CO3: Apply gravity model and nearest neighbour analysis
CO4: Document their results, using correct procedures and protocols.
CO5: Perform a quantitative analysis of experimental data including use of computational and statistical methods where relevant.

F. Y. B. A. Geography

Gg- 110 (A) Physical Geography Semester I

The student who successfully completes this course can able to:

CO1: Explain principal terms, Nature and scope of Physical Geography Branches of Physical Geography
CO2: Introduction about the Earth system (Lithosphere, Atmosphere, Hydrosphere and Biosphere)
CO3 : Interior of the earth.
CO4: Understand the origin of oceans and currents.
CO5: Understand the structure, composition of Atmosphere .
CO6: Understand weather phenomena winds, humidity and precipitation. .
CO7: Understand heat balance
CO8: Acquire knowledge of external forces.
CO9:Understand importance of ocean. .
CO10: Knowledge about effect of ocean Currents. .
CO11: Understand human impacts on Ocean.

Gg- 110 (B) Human Geography Semester-II

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

CO1: Describe underlying theory and concepts of experiments in course.
CO2: Calculate agricultural efficiency and analysis of methods, network structures, Lorenz curve and location quotient, logarithmic graph papers, child women ratio, age sex pyramid & dependency ratio, infant mortality rate and age specific mortality and population growth rate and population projection.
CO3: Apply gravity model and nearest neighbour analysis
CO4: Document their results, using correct procedures and protocols.
CO5: Perform a quantitative analysis of experimental data including use of computational and statistical methods where relevant.
CO6: Interpret relationships in graph format data and develop an intuition for alternative plotting or in a written laboratory report.
CO7: Derive conclusions from the analysis of own data.

S. Y. B. A. Geography

Course Gg-210: Oceanography & Climatology (General -2)

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

CO1: Explain definition, concept and theories of Oceanography
CO2: Describe nature, scope and development in oceanography.
CO3: Describe the origin of the ocean Basins, world oceans and their formations
CO4: Explain relief of the ocean bottom
CO5: Describe the properties and movement of sea water.
CO6: Explain sediments on the ocean floor
CO7: Explain principal terms and concept of Climatology.
CO8: Describe composition and Structure of Earth Atmosphere
CO3: Explain electromagnetic spectrum, its effect on earth atmosphere and types of insulation.
CO4: Explain basic concepts of air temperature, air pressure and its measurement.
CO5: Explain basic concepts of wind and wind measurement.
CO6: Describe scales of Atmospheric Motion and Models of air circulation.
CO7: Explain basic concepts of hydrological cycle, condensation and evaporation.
CO8: Describe concept of Lapse Rate, Stable and unstable Atmosphere, Air Masses

& Fronts.

Course Gg.220: Economic Geography (S-1)

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

CO1: Define basic principles and concepts in Economic Geography. CO2: Describe dynamic aspect of economic geography.
CO3: Explain Activities for global Economic development.
CO4: List type of resources for economic development and its applications.
CO5: Describe skill of planning the economic development and its management. CO6: Describe skill of industrial, agricultural transport and trade activities.
CO7: Apply applications of economic geography in different areas of growth and development.

Course Gg230: Fundamentals of Geographical Analysis (S-2)

After successfully completing this course, students will be able to: CO1: Explain basic concepts of map and scale.
CO2: Identify different Types of Map Projections.
CO3: Describe basic of Statistical data and the skill of graphical data representation. CO4: Apply Surveying Techniques in Geography.
CO5: Explain about preparation of layout.
CO6: Describe surveying instruments and their applications.
CO7: Demonstrate preparation of drawing profile with the help of Dumpy Level. CO8: Conduct geographical field investigation and report writing.

T.Y.B.A. Geography

Course Gg 310: Geography of India (G-3)

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

CO1: Describe geographical location, economic position and geological structure of India in relation to World.
CO2: Explain physiographic divisions and drainage system of India.
CO3: Describe climatic regions and seasons of India using climatic data.
CO4: Describe soil types and their distribution in India by using geographical map.
CO5: Describe major forest types, crops and their distribution and production in India
CO6: Describe mineral power resources and major Industries distribution in India
CO7: Evaluate population growth and distribution in India.
CO8: Evaluate regional development in terms of infrastructure, industries and agriculture.

Course Gg: 320 Agriculture Geography (S-3)

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

CO1: Explain principal terms, definitions, nature and scope of Agriculture Geography CO2: Discuss fundamental concept, land use, crops, agricultural production and

Development, determinants of agricultural activities, physical determinants,

and socio-economic determinants.

CO3: Explain different types of agriculture.

CO4: Discuss problems and prospects of agriculture with Indian examples. CO5: Demonstrate knowledge of irrigation and watershed management.

CO6: Evaluate allied areas in agriculture and agricultural development.

CO7: Apply the geographical knowledge in the sustainable agriculture development and agriculture in India.

Course Gg-301 Techniques of Spatial Analysis (S-4)

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

CO1: Explain basic concepts of statistical and remote Sensing. CO2: Identify different methods of Relief Representation.

CO3: Describe basic of Statistical data and the skill of data representation. CO4: Apply Remote Sensing Techniques in Geography.

CO5: Interpret top sheet/ map, aerial photographs and analysis of toposheet/ map, aerial Photographs.

CO6: Describe weather instruments and their applications in Geographical phenomena.

CO7: Calculate Central Tendency, Variance and Standard Deviation, Correlation and Regression, and Testing of Hypothesis.

CO8: Conduct Survey of socio-economic conditions of a village and geomorphologic field investigation and report writing.

Department of Political Science

Program Outcomes

Political Science is a theoretically innovative department that encourages methodological and intellectual pluralism. The Department of Political Science **offers some courses** to students interested in learning about the political world around them, and to students seeking career options in government and related fields.

The study of Government and Politics gives our students broad training in political science and is especially useful in preparation for the further study . This subject also accommodates students wishing to enter public service or who are interested in public administration or law school. Those wishing to enter public service or are interested in the study of public administration at the post-graduate level greatly benefited from the subject. With the help of Political Science programs, students analyze the fundamental theories and philosophies of government, economy, and civil society; and apply them to contemporary political systems. They can compare and contrast complex political issues and events within the context of the diverse political systems around the world. Students are prepared to enter positions within the government at the federal, state, and local levels or within the private sector as government relations specialists, public policy mangers, and contractors. The subject enables students to start or advance career in political science.

Course outcomes of Political Science:

Introduction to Indian Constitution (F.Y.B.A.)

To understand the philosophy of Indian constitution.

• To identify the causes, impact of British colonial rule.

• To appreciate the various phases of Indian national movement.

• To create value in young youth regarding the patriotism.

• To understand the various Government of Indian acts their provision and reforms.

• To know the salient features in making of Indian constitution

• To appreciate the socio-economic political factors which lead to the freedom struggle.

• To understand the constitutional orderings and institutional arrangement.

• To appreciate the fundamental rights and duties and the directive principle of state policy

• To evaluate the evolution, functioning and consequences of political parties in India.

• To identify how electoral rules and procedure in India effect election outcomes.

Political Theory and Concepts.(S.Y.B.A.)

To understand the nature and scope of political theory.

• To understand the significance of political theory.

• To acquaint with the theories, approaches, concepts and principles of political theory.

• To appreciate the procedure of different theoretical ideas in political theory.

• To Interpret and assess information regarding a variety of political theory.

• To understand the various traditional and modern theories of political science.

• To evaluate the theories of origin of the state.

• To comprehend the sources of political information's.

Political Ideologies. (T.Y.B.A.)

The study of political ideologies gives the student a window through which to view complex political phenomena. This course examines the origins and impact of ideologies on the development of societies. Major ideologies such as nationalism, liberalism, conservatism, anarchism, Marxist theory, socialism, applied Marxism, fascism, Nazism, feminism, environmentalism and Third World ideologies are covered.

- To examines the origin and impact of ideologies.
- To understand the importance of ideology in process of making government.
- To search the role of ideologies in policy making/law making.
- To study that how various ideologies covered human life.
- Student get the idea, 'How ideologies force to act ones as political actor'.

DEPARTMENT OF COMMERCE

DETAILS OF PROGRAMME OUTCOMES

Programme:B.Com.

Objectives of the course:

1. To provide in depth knowledge of socio-economic aspects.
2. To familiarize with current and recent developments in Economics
3. To enrich knowledge through problem solving, hands-on activities projects.
4. To provide a broad and comprehensive knowledge in micro and macro Economics, Public Economics, Indian Economy and Agricultural Economics.
5. To develop analytical abilities towards real world problems

Programme Specific Outcome:

1. After completion of program, students will be able to have in-depth knowledge of basic concepts in Economics.
2. A good academic background to be able to seek admission for master's degree in Economics
3. An academic background to be able to crack the banking and administrative examinations

F.Y.B.Com.

Financial Accounting

Course Outcomes

To impact the knowledge of various accounting concepts.

1) To instill the knowledge about accounting procedure, methods and techniques
2) To acquaint them with practical approach to accounts writing by using software package.

Program Specific Outcomes

1) After completion of this course students will aware about various accounting concepts and accounting standards.
2) Students will aware about the basic course in tally.
3) Students will get ideas about the various accounting concepts like Amalgamation, dissolution, conversion and the basic concepts related royalty.

Business Mathematics and Statics

Course Outcomes

1) To prepare for competitive examination
2) To understand the concept of simple interest, compound interest and the concept of EMI
3) To understand the concept of shares and to calculate dividend
4) To understand the concept of population and sample
5) To use frequency distribution to make decision
6) To understand and calculation of various types averages and variations

Program Specific Outcomes

1) After studying this paper students will able to understand the basic concepts regarding Business math.
2) Students will well prepare for the competitive exam
3) Students will able to calculate the various calculations like simple interest, compound interest and the other terms related with busi. Math.

Marketing and Salesmanship

Course Outcomes

1) To create awareness about market and marketing
2) To establish link between commerce and marketing
3) To understand the basic concept of marketing
4) To understand marketing philosophy and generating ideas for marketing research
5) To know the relevance of marketing in modern competitive world
6) To develop an analytical ability to plan for various marketing strategy

Program Specific Outcomes

1) After completion of the program students are understand the basic knowledge of market and marketing.
2) Students are understand the marketing philosophy and able to generate ideas about marketing research
3) After getting the knowledge of marketing students are able to plan the marketing strategy

comsumar Protection and Business Ethics

Course Outcomes

1) Understand the concept of Consumerism
2) Equip the students with knowledge the evolution need and importance of Consumerism
3) Handling the emerging issues about consumer protection

Program Specific Outcomes

1) Understand the concept of E commerce and Consumer Protection
2) Acquaint Students sbout various issues of E commerce
3) Able to appreciate the emerging questions and policy issues

Organizational Skill Development

Course Outcomes

1) To orient the students towards the concept of Organization and Modern Office.
2) To acquaint the students with the role of and Functions of Office Manager.
3) To develop the insights regarding Organizational Skills for Office Managers.
4) To know the functioning of Modern office appliances equipments and e-format records

Program Specific Outcomes

1) Students will aware about the modern office and the various functions of office manage
2) Students will able to get the organizational skill for office managers
3) Easy to clear the various function about the modern office appliances.

S.Y.B.Com

Business Communication

Course Outcomes

1) To understand the concept, process and importance of communication.
2) To develop awareness regarding new trends in business communication.
3) To provide knowledge of various media of communication.
4) To develop business communication skills through the application and exercises.

Program Specific Outcomes

1) Apply business communication strategies and principles to prepare effective communication for domestic and international business situations.

2) Identify ethical, legal, cultural, and global issues affecting business communication.
3) Utilize analytical and problem solving skills appropriate to business communication.
4) Participate in team activities that lead to the development of collaborative work skills.
5) Select appropriate organizational formats and channels used in developing and presenting business messages.
6) Compose and revise accurate business documents using computer technology.
7) Communicate via electronic mail, Internet, and other technologies.
8) Deliver an effective oral business presentation.

Corporate Accounting

Course Outcomes

1) To make aware the students about the conceptual aspect of corporate accounting
2) To enable the students to develop skills for Computerized Accounting
3) To enable the students to develop skills about accounting standards

Program Specific Outcomes

1) After completing the syllabus of this course students will aware about the conceptual aspect of corporate accounting
2) Students will aware about accounting standard and computerized accounting practices

Business Management

Course Outcomes

1) To provide basic knowledge & understanding about business management concept.
2) To provide an understanding about various functions of management.

Program Specific Outcomes

1) After studying this subject student will able to understand the basic concepts regarding the business management
2) Students will able to understand the functions of management and its

applications

Elements of Company Law

Course Outcomes

1) To impart students with the knowledge of fundamentals of Company Law.
2) To update the knowledge of provisions of the Companies Act of 2013.
3) To apprise the students of new concepts involving in company law regime.
4) To acquaint the students with the duties and responsibilities of Key Managerial Personnel.
5) To impart students the provisions and procedures under company law.

Program Specific Outcomes

1) Students will able to understand the basics of company law and its applications
2) To understand the various amendments made in the company act 2013.
3) After getting the knowledge students will able to work out as per company act 2013.

Business Administration –I

Course Outcomes

1) To provide basic knowledge about various forms of business organizations
2) To acquaint the students about business environment and its implications thereon.
3) To aware them with the recent trends in business

Program Specific Outcomes

1) After studying this students will got the knowledge about various business entities like sole traders, partnership, co-operative and company
2) Students will aware about the environmental effects of various factors on the business.

Markrting Management Paper I

Course Outcomes

1) To orient the students recent trends in marketing management
2) To create awareness about marketing of eco friendly prouduts in the society

though students
3) To inclucate knowledge of various aspects of marketing though practical approach

Program Specific Outcomes

1) To acquaint the students with use of E-Commerce in competitive environment
2) To help the students understand the influences of marketing management on consumer behavior

T.Y.B.Com

Business Regulatory Framework

Course Outcomes

1) To acquaint students with the basic concepts, terms & provisions of Mercantile and Business laws
2) To develop the awareness among the students regarding these laws affecting business, trade, and commerce.

Program Specific Outcomes

1) After studying this students will able to understand the basic concepts of law in respect of mercantile and business
2) After the study students will aware about the effects of this law on the business.

Advanced Accounting

Course Outcomes

1) To impart the knowledge of various accounting concepts
2) To instill the knowledge about accounting procedures, methods and techniques.
3) To acquaint them with practical approach to accounts writing by using software package.

Program Specific Outcomes

1) Students will able to understand the various accounting concepts
2) Students will able to follow the computerized accounting practices
3) They will able to clear the accounting standard and its applications

Auditing and Taxation

Course Outcomes

1) To acquaint themselves about the concept and principles of Auditing, Audit process,Assurance Standards, Tax Audit, and Audit of computerized Systems.
2) To get knowledge about preparation of Audit report.
3) To understand the basic concepts and to acquire knowledge about Computation of Income,Submission of Income Tax Return, Advance Tax, and Tax deducted at Source, Tax Collection Authorities under the Income Tax Act, 1961.

Program Specific Outcomes

1) After studying the subject students will understand the application of auditing
2) They will liable to make audit report
3) Students will able to fill up return of the individual assesse.

Business Administration II and III

Course Outcomes

1) To acquaint the students with basic concepts & functions of HRD and nature of Marketing
2) functions of a business enterprise.
3) To acquaint the students with the basic concepts in finance and production functions of a business enterprise.
4) The subject provides students with fundamental knowledge about business like finance, money policy and business management. It shall help to let students know about recent trends in management and business risk management. With this students will be equipped with necessary knowledge about running a business, business operations,having an overview of industrial and organizational establishments. It also will inform about the concepts of business and management like insurance, retail marketing, supply chain, banks etc.

Program Specific Outcomes

1) Students will able to follow the various functions of HRD
2) Application of functions of Marketing
3) Students will understand the basic function of finance and various function.

Markrting Management Paper II & III

Course Outcomes

1) To understands the concepts and functioning of marketing planning and sales management
2) To know marketing strategies and organization
3) Ti inform various facets of marketing with regulatory aspects
4) This subject is introduced with the intent of imparting marketing knowledge among students. It shall help students to build marketing capability in students and thus, be able to sell themselves in outside market. The subject covers strategies for developing new products and services that are consistent with evolving market needs. Evaluate the viability of marketing a product or service in a market or markets. Evaluate results of marketing activities using criteria related to budgeted sales, costs and profits.

Program Specific Outcomes

1) To understand marketing in globalize scenario
2) To know detailing of Marketing Research
3) To understand the role Brand and Management in Marketing
4) To inform about Marketing and Economic Development
5) To know of the importance of control on marketing activities

Department of Physics

Program Specific Outcomes

PSO1 Students are expected to acquire acore knowledge in physics, including the major premises of classical mechanics, quantum mechanics, electromagnetic theory, electronics, optics, special theory of relativity and modern physics.

PSO2 Students are also expected to develop a written and oral communication skills in communicating physics-related topics.

PSO3 Students should learn how to design and conduct an experiment (or series of experiments) demonstrating their understanding of the scientific method and processes. Not only that they are expected to have an understanding of the analytical methods required to interpret and analyze results and draw conclusions as supported by their data.

PSO4 Students will develop the proficiency in the acquisition of data using a variety of laboratory instruments and in the analysis and interpretation of such data.

PSO5 Students will learn the applications of numerical techniques for modeling physical

systems for which analytical methods are inappropriate or of limited utility.

PSO6 Students will realize and develop an understanding of the impact of physics and science on society.

PSO7 Apply conceptual understanding of the physics to general real-world situations.

PSO8 Describe the methodology of science and the relationship between observation and theory.

PSO9 Learn to minimize contributing variables and recognize the limitations of equipment.

PSO10 Discover of physics concepts in other disciplines such as mathematics, computer science, engineering, and chemistry.

PSO11 Develop the following experimental tools: Numerically model simple physical systems using Euler's method, curve fitting, and error analysis.

PSO12 Analyze physical problems and develop correct solutions using natural laws.

Course Outcomes

Principles of Physics:

Modern Physics:

CO1: Develop the concepts of modern physics: basic knowledge of special theory of relativity and general theory of relativity, elementary quantum mechanics, nuclear physics, and particle physics.

CO2: Understand the relationship between observation and theory and their use in building the basic concepts of modern physics.

CO3: Understand how major concepts developed and changed over time.

CO4: Capable of analyzing and solving problems using oral and written reasoning skills based on the concepts of modern physics.

CO5: Ability to prepare and organize a presentation on the application of modern physics to modern technology.

Wave optics

CO1: Understand the basic concepts of wave optics and an ability to compute basic quantities in optics.

CO2: Learn to use methods for solving differential equations.

CO3: Experience the diverse applications of the wave equation.

Solid State Physics

CO1: Understand basic concepts and mathematical methods of solid state physics.

CO2: Practice problem solving by using selected problems in solid state physics.

CO3: Explore important connections between theory, experiment, and current applications.

CO4: Develop a basis for future learning and work experience.

Nuclear and Particle Physics

CO1: Acquire knowledge in the content areas of nuclear and particle physics, focusing on concepts that are commonly used in this area.
CO2: Develop and communicate analytical skills in subatomic physics.
CO3: Develop familiarity with the vast areas of nuclear and particle physics as well as develop an interest in these subjects.

Classical Mechanics

CO1: Understand the terminology used in Classical Mechanics.
CO2: Employ conceptual understanding to make predictions, and then approach the problem mathematically.
CO3: Understand the important connections between theory and experiment.
CO4: Connect concepts and mathematical rigor in order to enhance understanding.

Electricity and Magnetism

CO1: Know the vocabulary and concepts of physics as it applies to: Principles of Electric Fields, Gauss's Law, Electric Potential, Capacitance and Dielectrics, Current and Resistance, Direct Current Circuits, Magnetic Fields, Sources of Magnetic Fields, Faraday's Law, Inductance, Alternating Current Circuits, and Electromagnetic Waves.
CO2: Understand the relationship between electrical charge, electrical field, electrical potential, and magnetism.
CO3: Be able to use electromagnetic theory and principles in a wide range of applications.
CO4: Learn a variety of advanced mathematical methods and computer techniques.
CO5: Develop skill to solve numerical problems on it.
CO6: Solve mathematical problems involving electric and magnetic forces, fields, and various electro-magnetic devices and electric circuits.
CO7: Develop explicit problem-solving strategies that emphasize qualitative analysis steps to describe and clarify the problem.
CO8: Gain confidence in their ability to apply mathematical methods to understand electro-magnetic problems to real-life situations.

Principles of Optics

CO1: To develop an understanding of the principles of optics.
CO2: To build connections between mathematical development and conceptual understanding.

Thermal and Statistical Physics

CO1: Understand how statistics of the microscopic world can be used to explain the thermal features of the macroscopic world.
CO2: Be able to use thermal and statistical principles in a wide range of applications.
CO3: Learn a variety of mathematical and computer techniques.

Quantum Mechanics

CO1: Learn the mathematical tools needed to solve quantum mechanics problems. This will include complex functions and Hilbert spaces, and the theory of operator algebra. Solutions of ordinary and partial differential equations that arise in quantum mechanics will also be studied.
CO2: Develop problem solving methods that will include mathematical as well as numerical computations and solutions.
CO3: Build connections between mathematical development and conceptual understanding.

Atomic Physics

CO1: Apply the mathematical tools developed to various quantum mechanics problems.
CO2: Develop problem solving methods that will include mathematical as well as numerical computations and solutions.
CO3: Build connections between mathematical development and conceptual understanding.

DEPARTMENT OF CHEMISTRY

B. Sc. Chemistry

Goals:

The Department has formulated three broad educational goals for the undergraduate degree programs:

Chemistry knowledge: To provide students with the basic foundation in Chemistry and allied subjects, the interplay of theory and experiment, and to motivate scientific enthusiasm and curiosity and the joy of learning.

Problem solving skills: To provide students with the tools needed to analyse problems with the skills required to succeed in graduate school, the chemical industry or professional school.

Employment and technical skills: To provide the students with technical skills necessary for successful careers in chemistry and related or alternative careers for which a chemistry foundation can be very useful. These include to a breadth of experimental techniques using modern instrumentation and communication skills (oral and written).

Programme Outcomes:

Knowledge outcome:

After completing B.Sc. Chemistry Programme students will be able to:

PO1: Transfer and apply the acquired fundamental knowledge of chemistry, including basic concepts and principles of 1) organic chemistry, Inorganic chemistry, Physical and Analytical Chemistry; (2) analytic techniques and experimental methods for chemistry to study different branches of chemistry;

PO2: Demonstrate the ability to explain the importance of the Periodic Table of the Elements and represent key aspects of it and its role in organizing chemical information.

Skills Outcomes

Professional Skills

After completing B.Sc. Chemistry Programme students will be able to:

PO3: apply and demonstrate knowledge of essential facts, concepts, laws, principles and theories related to chemistry;

PO4: demonstrate the learned laboratory skills, enabling them to perform qualitative and quantitative analysis of given samples and able to make conclusions on it;

PO5: set procedure and synthesize simple compounds of commercial importance.

PO6: engage in oral and written scientific communication, and will prove that they can think critically and work independently.

PO6: Communicate effectively using graphical techniques, reports and presentations within a scientific environment.

PO7: to recognize problems in chemical science and make strategies to solve it.

PO8: Respond effectively to unfamiliar problems in scientific contexts

PO9: Plan, execute of design experiment, make documentation of it, interpret data at entry level of chemical industry and report the results;

PO10: Integrate and apply these skills to study different branches of chemistry.

Generic Competencies

PO11: The student will acquire knowledge effectively by self-study and work independently, present information in a clear, concise and logical manner and apply appropriate analytical and approximation methods

PO12: The student will learn professionalism, including the ability to work in groups and in society, and apply basic ethical principles.

Program Specific Outcomes

After completing B. Sc. Chemistry, students will be able to

PSO1:Understand the nature and basic concepts of Physical, Organic and Inorganic chemistry;

PSO2: Analyse Organic and inorganic compounds qualitatively and quantitatively;

PSO3: Understand the applications of physical, organic, inorganic and analytical chemistry in pharmaceutical, agriculture and chemical industries;

PSO4: Able to perform experimental procedures as per laboratory manual in the area of physical, Inorganic and organic chemistry;

PSO5: interpretation and synthesis of chemical information and data obtained from chemical and instrumental analysis.

Course Outcomes:

F.Y.B.Sc. Chemistry

Paper-I, Physical and Organic Chemistry

At the end of course student will be able to -

CO1: define the terms related to Surface chemistry, Mole concept, redox reaction, chemical bonding, chemical mathematics, states of matter, thermodynamics and atomic structure.

CO2: explain the laws related to thermodynamics, GMV, redox reaction, mole concept, chemical mathematics and chemical bonding

CO3: Discuss formation of chemical bonds, Properties of gases and liquids such as ideal gas behaviour, van der Waal's and Critical constant and regarding P-V-T relations, viscosity, surface tension.

CO4: solve numerical problems related to Van der Waal's equation,

Critical constant and regarding P-V-T relations. surface tension,

entropy, mole concept, integrations, derivations and for plotting various types of graphs.

CO5: describe chemical bonding, structure and reactivity of organic compounds;

CO6: define the terms related to different functional groups of Organic compounds;

CO7: explain the chemical Preparation and reactions of Functional groups;
CO8: explain Stereochemistry of organic compounds;
CO9: interpret R/S Configurations of organic compounds;

Paper-II Inorganic and Analytical chemistry

By the end of this course students will able to
CO1: Introduction about atomic structure;
CO2: Theories about bonding in molecules;
CO3: recall the Periodic properties of s and p block elements;
CO4: describe periodic trends in s block elements;
CO5: describe periodic trends in p block elements;
CO6: Introduction about Analytical chemistry;
CO7:Various terms used in analytical chemistry such as molarity normality and mole concept as well as stoichiometry

Paper-III, Practical Chemistry

At the end of course student will able **to**
CO1: handle laboratory glassware's, hazardous chemicals safely in laboratory;
CO2: Set up the apparatus properly for the given experiments. Perform all the activities in the laboratory with neatness and cleanness;
CO3: maintain records of quantitative and qualitative analysis;
CO4: acquire laboratory skills for the purpose of collecting, interpreting, analysing, and reporting (in written form) chemical data;
CO5: explain mole concept and its application in the preparation of normal and molar solutions, and use of mole concept in quantitative calculations for inorganic analysis;
CO6: perform quantitative analysis using chemical methods of quantitative analysis;
CO7: illustrate physical chemistry principle with the help of experiments;
CO8: Describe and demonstrate data using graphical representations and communicate the report.

S.Y.B.Sc. Chemistry

CH 211: -Paper-I Physical and Analytical Chemistry

After completion of course student will able to

CO1: define order of reaction, molecularity of reaction, half-life period of reaction, quantum yield, florescence, phosphorescence, photo catalysis, Nernst distribution law, partition coefficient, qualitative and quantitative analysis, error, accuracy, precision, significant figure, interfering radicals, common ion effect, solubility product;

CO2: explain the terms and facts related to Chemical kinetics, first order and second order chemical reaction, law of photochemistry, theory of extraction, organic and inorganic qualitative analysis;

CO3: recognize order and molecularity of chemical reaction, apply distribution law for extraction process, apply procedure for removal of interfering ions;

CO4: derive rate equation for first and second order chemical reaction, Nernst distribution law, Lambert's Beers Law, efficiency of extraction;

CO5: describe order of chemical reaction, process of extraction, accuracy of analysis, precision in analysis, methods to minimize errors in analysis;

CO6: distinguish between first and second order chemical reaction, accuracy and precision in analysis, photochemical and thermal reactions;

CO7: calculate order of and molecularity of chemical reaction, absolute and relative error in analysis, standard deviation in analysis;

CO8: solve numerical problems related to Physical and analytical chemistry.

CH 221 Paper –I Physical and Analytical chemistry, Sem. –II

After completion of course student will able to

CO1: define Raoult's law, Henry law, Dalton's law, Ideal and non-ideal solutions, critical solution temperature, Azeotropic mixtures, Helmholtz and Gibbs free energy.

CO2: describe Raoult's law and variation of partial vapour pressure with mole fraction, various types of solutions, pH range of indicator of various indicators;

CO3: explain variation of Helmholtz free energy and Gibbs free energy with their parameter, equilibrium conditions for a chemical reaction, variation of boiling point with vapour pressure, best

indicator for various types of titrations, equivalence and end point of titration;

CO4: distinguish between ideal and non-ideal solution, miscible and immiscible liquid pairs, primary and secondary standard solution, equivalent weight and molecular weight;

CO5: draw P-N and T-N diagrams for ideal and non-ideal solutions, titrations curve for various types of titrations;

CO6: judge end point of various types of titrations, choose best indicator of various types of titrations;

CO7: calculate pH at various points of titrations, partial vapour pressure at various compositions of solutions, molecular weight by steam distillation;

CO8: solve numerical problems related to syllabus.

CH 212: Paper-II, Organic and Inorganic Chemistry, Sem.-I

After completion of course student will able to

CO1: define terms related to: optical isomerism, conformations of cyclohexane, elimination reaction, substitution reaction, addition reaction and rearrangement reaction, metallurgy and corrosion. Write formulas of organic and inorganic compounds. Write elementary reactions in organic and inorganic chemistry related to syllabus;

CO2: explain the terms and facts related to: optical activity and isomerism, conformations of cyclohexane, corrosion and metallurgy. Will explain process of: metallurgy of Al, Fe, corrosion. Explain how to avoid the corrosion;

CO3: recognize functional groups and their reactions, addition reaction, nucleophilic substitution, elimination reaction. Will wire and explain mechanism of reactions such as SN1, SN2, E1, E2, Markovnikov's, rule, Saytzeff's rule;

CO4: apply reaction mechanism to predict the products of reaction in SN1, SN2, E1, E2, rearrangement reaction. Apply rules of absolute configuration and will predict the configuration at chiral C atom;

CO5: determine absolute configuration at chiral C atom, determine suitable process for purification of particular ore, predict the products of specific organic reactions related to syllabus, predict the stability of different conformations of cyclohexane;

CO6: reasoning for appropriate facts related to optical activity, metallurgy, corrosion, reaction mechanism;
CO7: draw diagrams of various metallurgical processes;
CO8: predict products of various chemical reactions.

CH-222: Paper-II, Organic and Inorganic Chemistry, Sem. II

After completion of course student will able to

CO1: define terms: biomolecules, carbohydrates, proteins, glyosidic bond, peptide bond, optical activity, monosaccharides, polysaccharides, oxidation, reduction, oxidizing agent, reducing agent, acid, bases, solvents, Arrhenius, bronsted, Lewis definitions of acids and bases, d block elements, 18-electron rule, homogeneous catalysis, toxicology, etc.;

CO-2: explain the terms and chemical facts related to: carbohydrates, proteins, oxidation and reduction, d-block elements, carbonyl compounds, acids-basses- solvents and toxic metals in environment;

CO-3: recognize functional groups and their reactions, oxidation reaction, reduction reaction. Will wire and explain mechanism of reactions such as Cannizzaro's reaction, birch reduction, reduction by NaBH4 / LiAlH4, reduction of carbonyl group, oxidation by KMnO4, K2Cr2O7, hydro-formylation reaction, Wacker's reaction, etc.;

CO-4: apply reaction mechanism and should predict the correct products of reaction in Cannizzaro's reaction, Birch reduction, reduction by NaBH4 / LiAlH4, reduction of carbonyl group, oxidation by KMnO4, K2Cr2O7, Hydro-formylation reaction, Wacker's reaction, etc.;

CO-5: evaluate the possibility of correct products in oxidation reduction reaction, homogeneous catalysis, correct trends in periodic properties of d-block elements.

CO-6: reasoning for appropriate facts related to acids-bases-solvents, toxicology of heavy metals, homogeneous catalysis, d-block elements, oxidation and reduction reaction of organic compounds, carbohydrates and proteins;

CO-7: write strategy for the synthesis of required products;

CO-8: solve numerical related organic and inorganic chemistry.

CH-223 Chem. Paper-III, Practical Chemistry

After completion of practical course student should be able to

CO1: verify theoretical principles experimentally

CO2: interpret the experimental data and improve analytical skills

CO3: correlate the theory and experiments and understand their importance and Acquire the simple and complex practical skill

CO4: Separation of organic compound and their identification by chemical methods.

CO5: Write balanced equation for all the reactions, they carry in the laboratory.

CO6: Perform organic synthesis and follow the progress of the reaction by using TLC technique.

CO7: Set up the apparatus properly for the given experiments. Perform all the activities in the laboratory with neatness and cleanness

CO8: Perform the complete qualitative chemical analysis of the given inorganic mixture and find out acidic and basic radicals.

T.Y.B. Sc. Chemistry

CH-331 Physical chemistry, Sem.-I

At the end of course students will able to

CO1: define / recall various terms related to electrolytic conductance, molecular spectroscopy, chemical kinetics and phase diagram.

CO2: write correct equation such as Ohms law, equivalent conductance, molar conductance, rate constant of first, second, third order reactions, Kohlarch's law, Debye equation, transport number, molar polarization, force constant, energy of rotational, vibrational excitations, etc.

CO3: derive equations for half-life of third order reaction, rate constant of third order reaction, transport number, dipole moment, molar polarization, reduced mass of diatomic molecule,

etc.

CO4: explain / describe various terms in electrolytic conductance, molecular spectroscopy, chemical kinetics and phase diagram. To derive relations between / among various terms / quantities in electrolytic conductance, molecular spectroscopy, chemical kinetics and phase diagram

CO5: differentiate between / among the terms / quantities with suitable example such as molecularity and order of reaction,

conductance and resistance, equivalent and molar conductance, rotational and vibrational spectra, etc.

CO6: apply his knowledge to explain / interpret spectra of simple diatomic molecules.

CO7: describe facts and observations in electrolytic conductance, molecular spectroscopy, chemical kinetics and phase diagram.

CO8: solve numerical related to electrolytic conductance, molecular spectroscopy, chemical kinetics and phase diagram.

CH-341 Physical chemistry, Sem.-II,

At the end of course students will able to

CO1: define / recall various terms related to electrochemistry, nuclear chemistry and application of radioactivity, crystallography and basics of quantum chemistry.

CO2: write / remember the correct equation such as Nernst equation, representation of cell and cell reactions, Bragg equation, half of radioactive materials, etc.

CO3: derive equations for potentials of various types of cells and electrodes, Bragg equation, half of radioactive materials, kinetics of decay of radioactive materials, particle in 1D box, quantum tunnelling, etc.

CO4: explain / describe various terms related to electrochemistry, nuclear chemistry and application of radioactivity, crystallography and basics of quantum chemistry.

CO5: derive relations between / among various terms / quantities related to electrochemistry, nuclear chemistry and application of radioactivity, crystallography and basics of quantum chemistry.

CO6: apply his knowledge to explain experimental observation andshould able to correlate theory and particle or observed facts.

CO7: describe facts and observations related to electrochemistry, nuclear chemistry and application of radioactivity, crystallography and basics of quantum chemistry.

CO8: solve numerical in in electrolytic conductance, molecular spectroscopy, chemical kinetics and phase diagram.

CH-332 Paper –II Inorganic Chemistry Sem-III

At the end of course students will able to

CO1: Define terms related to molecular orbital theory, coordination chemistry

CO2: Explain mononuclear and hetero nuclear molecules, LCAO principle, primary and secondary valency, bond order and magnetic properties of molecules

CO3: Distinguish between atomic and molecular orbitals, bonding and antibonding molecular orbitals, different theories of coordination chemistry

CO4: Draw MO energy level diagrams for homo and hetero nuclear diatomic molecules, crystal field splitting energy level dig. for octahedral and tetrahedral complexes

CO5: Apply IUPAC nomenclature rules and writ name of coordinate complexes, predict structure of complexes by using hybridization CO6: Describe valance bond theory and crystal field theory to different type of complexes

CO7: Calculate effective atomic number and crystal field stabilization energy for various complexes

CO8: solve numerical problems related to syllabus

CH-342 Paper –II Inorganic Chemistry Sem-IV

At the end of course students will able to

CO1: define lanthanides, actinides, semiconductors, superconductor, close packed structure, lanthanide contraction, super heavy elements, catalyst, catalysis

CO2: describe lanthanide contraction, types of holes in close pack structure

CO3: distinguish between lanthanides and actinides, homogeneous and heterogeneous catalysis, n-type and p-type semiconductor, nuclear fusion and fission

CO4: explain applications of lanthanides and actinides, superconductivity, acetic acid synthesis, properties of heterogeneous catalyst, separation of lanthanides

CO5: explain n(E), and N(E) curves for semiconductors, band structures for sodium metal, haemoglobin, vita. B12

CO6: predict product of nuclear reactions, geometry of ionic solid from radius ratio effect

CO7: derive names of super heavy elements and symbols form IUPAC rules

CO8: solve numerical problems related to syllabus.

CH -333 Paper III: Organic chemistry Sem. III

By the end of this course students will able to

CO1: define the terms related to Organic Reactions such as Aliphatic Nucleophilic, Aromatic electrophilic and Nucleophilic Substitution Reactions

CO2: list Different factors responsible for reactivity of organic compounds in Addition reactions to Unsaturated compounds

CO3: recall the information about acidity and Basicity

CO4: explain the Elimination reactions

CO5: solve the chemical Reactions for Aliphatic Nucleophilic, Aromatic electrophilic and Nucleophilic Substitution Reaction

CO6: classify the organic reactions like substitution, Addition and elimination Reactions.

CO7: categorize different nucleophiles Electrophiles and Bases.

CO8: judge what type of reagent need for the organic Conversion.

CH-343 Paper III: Organic chemistry Sem. IV

By the end of this course students will able to

CO1: define the terms related to Organic Reactions such as Carbanion, Retrosynthetic analysis Rearrangement Reactions and Spectroscopic methods of structure determination.

CO2: list Different factors responsible for reactivity of organic compounds in Oxidation, Reduction, Rearrangement Reactions

CO3: recall the information about Reactivity stability of carbanion

CO4: explain the Rearrangement reactions

CO5: solve the chemical Reactions for Carbanion Retrosynthetic analysis and rearrangement reactions

CO6: calculation of Wavelengths of Organic compounds.

CO7: identification of different functional groups in organic compounds.

CO8: judge the structure of organic compounds

CH-334 Paper- IV Course- Analytical Chemistry, (Semester -I)

At the end of course students will able to

CO1: remember /write/ explain terms/ recall the terms such as gravimetric analysis, common ion effect, solubility product, formation of complex ion, TGA, DTA DSC, spectrophotometry, terms related to absorption measurement, polarography, FES, AAS.

CO2: explain principles of electro-gravimetric analysis, Thermogravimetric analysis, differential thermal analysis, beers law and lamberts law, Polarography, AAS, FES.

CO3:describe various components used in UV-Visible Spectrophotometry, AAS, FES, Polarography, TGA and DTA

CO4: describe equations or reaction of solubility product, law of mass action, Lambert –Beers Law equation, Ilkvoic equation, equation for no. atoms in excited state, Nernst equation.

CO5: describe Instrumentation of UV-Visible Spectrophotometry, AAS, FES, Polarography, TGA and DTA

CO6: solve numerical problems related to solubility product, common ion effect, Thermal methods of analysis, polarography, spectrophotometry, AAS and FES

CO7: apply Electro-gravimetric analysis for separation of metal ion, TGA, DTA, spectrophotometry, polarography AAS and FES.

CO8: select particular chemical or instrumental method for analysis of sample

CH-344 Analytical Chemistry, (Semester -II)

At the end of course students will able to

CO1: remember /write/ explain terms/ recall the terms such as Distribution coefficient, Distribution ratio, Solvent extraction, chromatography, types of chromatography, Electrophoresis, types of electrophoresis, Nephelometry and Turbidimetry.

CO2: define the terms migration velocity, moving boundary method, zone electrophoresis, disc electrophoresis, Rf value, retention time, supercritical fluid chromatography, normalization, secondary peak, salting out, masking agent, counter-current extraction, synergistic extraction.

CO3: discuss various components used in GC, HPLC, Turbidimetry and Nephelometry.

CO4: derive relationship between distribution coefficient and distribution ratio, equation of turbidance, equation of multiple extraction.

CO5: describe Instrumentation of HPLC, GC, Turbidimetry, Nephelometry, electrophoresis.

CO6: solve numerical problems related to distribution ratio, % extracted, Rf values, no. of plates and theoretical plate, turbidance.

CO7: apply HPLC, paper chromatography, solvent extraction, GC, electrophoresis, Turbidimetry and Nephelometry technique for analysis.

CO8: select particular techniques for separation of sample

CH 335 Paper –V of Industrial Chemistry (Paper-V) Sem III,

By the end of this course student will able to-

CO1: define all the terms related to modern approach to chemical industry, agrochemicals, food and starch.

CO2: list basic chemicals, petrochemicals and eco-friendly fuels, cement and glass industry.

CO3: recall information about basic chemicals used in industry, agrochemicals, fuels and their types, nutritive aspects of food.

CO4: explain processes of manufacture of chemicals related to industry, properties of fuels, nutritive aspects of food and quality of soil.

CO5: calculate/determine calorific values of fuels.

CO6: classify fuels, chemical reactions, plant nutrients, herbicides, pesticides, insecticides and fungicides, glass and cement.

CO7: analyse applications and synthesis of different types of industrial chemicals and agrochemicals

CO8: select which principles are appropriate for industrial set up and to improve the yield of product.

CH 345 Industrial Chemistry (Paper V) Sem. IV,

By the end of this course students will able to

CO1: define the terms related to polymer chemistry, sugar and fermentation industry, soaps, detergents and cosmetics, dyes and paints, pharmaceutical industry, and terms related with pollution prevention and management.

CO2: list types of polymers, soaps, detergents, cosmetics, dyes, paints and pharmaceuticals.

CO3: recall information about soaps, detergents, fermentation process, dyes paints, drugs and pollution.

CO4: explain properties of drugs, polymers, soaps, detergents, dyes, paints and sugars.

CO5: determine quality of manufactured products in sugar and fermentation industry.

CO6: classify commercial polymers, soaps, detergents, cosmetics, dyes, paints, pigments and drugs.

CO7: analyse different types of manufacturing process of sugar industry, fermentation process and pollution prevention and waste management.

CO8: select what types of cosmetic products, drugs are important for human health.

CH 336D Environmental and Green Chemistry (Paper-VI) Semester: - III

By the end of this course students will able to

CO1: Importance and conservation of environment

CO2: Study of composition of atmosphere, ozone depletion and understand social issues

CO3: Study of water resources, Quality of potable water, limits for toxic materials in water stream, quality measures.

CO4: Introduction to Green chemistry

CO5: Need of green chemistry technology and principle of green chemistry

CO6: Advantages of green chemistry, Catalytic routes for sustainable developments

CH 346DEnvironmental and Green Chemistry (Paper-VI) Semester: - IV

By the end of this course, the student will able to

CO1: Study of waste water treatment process and study of waste water plants, Method of water purification

CO2: Explain types of soil, components of soil and types of solid waste and their disposal

CO3: discuss about techniques used to monitor hazardous materials present in environment

CO4: explain the greenhouse gases and their effects, global warming and climate change

CO5: Importance of water as a green solvent

CO6: Study of natural sources of energy

CH-347 Practical Paper-I, Physical Chemistry Practical

CO1: Maintaining records of chemical and instrumental analysis.

CO2: Laboratory skills for the purpose of collecting, interpreting, analysing, practical data.

CO3: Laboratory skills for the purpose handling different analytical instruments.

CO4: Interpretation of results of experiment and their correlation with theory.

CO5: Study of reaction kinetics practically.

CO6: Study of conduct metric, potentiometric, colorimeter and pH metric principles.
CO7: Application of conduct metric, potentiometric, colorimetric and pH metric measurement in quantitative analysis.
CO8: Viscosity measurement and its application.
CO9: Refractometric measurement and its application.

CH-348 Practical Paper-II, Inorganic Chemistry Practical

CO1: Maintaining records of quantitative and qualitative analysis.
CO2: Laboratory skills for the purpose of collecting, interpreting, analysing, and reporting (in written form) chemical data.
CO3: Laboratory skills for the purpose handling different equipment's and analytical instruments.
CO4: Identify methods and instruments that can be used qualitative and quantitative analysis.
CO5: Mole concept and its application in the preparation of normal and molar solutions, and use of mole concept in quantitative calculations for inorganic analysis.
CO6: Choice of proper quantitative methods for analysis of samples containing inorganic substances.
CO7: Synthesis and purify coordination compounds.
CO8: Statistical treatment to quantitative data
CO9: Quantitative analysis using instrumental methods of quantitative analysis.

CH-349 Practical Paper-III, Organic Chemistry Practical

CO1: Maintaining records of quantitative and qualitative analysis.
CO2: Laboratory skills for the purpose handling different equipment's and analytical instruments.
CO3: Study of organic reactions their applications.
CO4:Separation of mixture of organic compound and their identification by chemical methods.
CO5: Perform organic synthesis and follow the progress of the reaction by using TLC technique.
CO6: Choice of proper quantitative methods for analysis of samples containing organic substances.
CO7: Synthesis and purify organic compounds.
CO8: understanding of reaction mechanism involved.
CO9: physical constant determination.

DEPARTMENT OF BOTANY

B.SC. BOTANY

PROGRAM OUTCOMES

1. To increase knowledge of basic natural sciences:
Basic science knowledge is important for any further study and research. Students are known about different types of lower plants such as Algae, Fungi, Bryophyte and Pteridophytes that indicates the evolution in plants. Students will be able to apply the scientific method to questions in biology by formulating testable hypotheses, gathering data that address this hypothesis, and analyzing those data to assess the degree to which their scientific work supports their hypotheses.

2. To aware about scientific knowledge: Students will be able to apply the scientific method to questions in biology by formulating testable hypotheses, gathering data that address these hypotheses, and analyzing those data to assess the degree to which their scientific work supports their hypotheses. Experiments are based on scientific techniques. Industrial product production requires basic skills and knowledge which is useful for welfare of society and career of Students.

3. To study modern technique: This is an era of Biotechnogy, in which different microbial origin biotechnological product used daily for normal survival of human beings. Cell biology and genetics, provide knowledge about tools & technique of recombinant DNA technology plant tissue culture and their importance and applied in different scientific practices.

4. Basic sciences and advanced biotechnological techniques: In Food Industries, Pharmaceutical Industries, Wine Industries, Fiber Industry, Fodder Industry, Leather Industry, Agriculture Industry, Plant Tissue Culture Industry, Mushroom Industry, Biofuel Industry, Biopesticide Industry, Biofertilizer Industry, Vermi culture Industry, Fruit Processing Industry, Horticulture Industry etc. mainly based on biotechnological techniques.

Practical skills: Students getting idea about how to perform the experiments of different Botany subject. He learns many things like imagination, innovation, procedure, applications, interpretation of results, plant part sectioning, staining and many other laboratory techniques. Student easily identification of plant, classification, uses of plants. Student learns many physiological, pathological, genetical, ecological phenomenon.

5. Critical thinking: Curriculum is modified for the betterment of the students; enhance the ability and thinking power.

6. Environment and sustainability: Healthy environment is necessary for normal and healthy life. Due to industrialization and automotive vehicles environment get imbalanced. Today's

environment is polluted by different mechanisms. Conservation practices are need to sustainable development.

7. Enhance life skills: By learning Science, increase in reading, writing, thinking ability and planning of work Increases our knowledge, curiosity by the use of internet and other resources.

8. Processing goods according to need: Know Industrial expectations, need of the Society; one can produce the product of best quality. The students are making aware about use of plants in the various Industries and their products. Students Motivated for the entrepreneurship.

9. Successful career in Botany: Botany is a fundamental basic natural science. By learning and applying basic techniques to start up a business. In other fields like Forestry, Plant Nursery, Plant Tissue Culture, Plant Research Institutes. Also good career is available in Agriculture sector, different government and non-government fields.

10. Effective communication: Field visits and study tours leads to improve our Communication skills in English language. So we can able to write effectively reports, presentations and explanation. Individual work is effectively done in a team and as a member. By this students communication skill enhanced.

11. To help to farmers: Agriculture is a backbone of our country. Botany learners can help the farmers in response of Diseases Control, Plant Yield, Biopesticide, Hybrid Seed Production, Use of Biofertilizers etc. Botany Department has organized two days state level Seminar on "Role of Biofertilizers in Modern Agriculture" on 16th and 17th Jan. 2015. In this seminar eminent resource persons shared their experiences, views and practical knowledge with the farmers.

12. Research: Skillful experimental study is useful for sustainable development, conservation of environment, reduce pollution, Agricultural problems and many burning issues related to Agriculture can be solved by the research activities.

13. Socio economical challenges: Increasing population and unemployment is the main barrier of development of India. To establish small scale Industries like Food Industries, Pharmaceutical Industry, Wine Industry, Fiber Industry, Fodder Industry, Leather Industry, Agriculture Industry, Plant Tissue Culture Industry, Mushroom Industry, Biofuel Industry, Biopesticide Industry, Biofertilizer Industry, Vermi culture Industry, Fruit Processing Industry, Horticulture Industries are economically empowering the unemployed youth.

Programme Specific Outcomes: **PSOs of B.Sc. Botany:**

PSO1. 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.

PSO2. 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.

PSO3. Accurately interpretation of collected information and use taxonomical information to evaluate and formulate a position of plant in taxonomy.

PSO4. 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.

PSO5. Students will be able to present scientific hypotheses and data both orally and in writing in the formats that are used by practicing scientists.

PSO6. Students will be able to access the primary literature, identify relevant works for a particular topic, and evaluate the scientific content of these works.

PSO7. Students will be able to apply fundamental mathematical tools (statistics, calculus) and physical principles (physics, chemistry) to the analysis of relevant biological situations.

PSO8. 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.

PSO9. 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.

PSO10. 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.

PSO11. 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.

PSO12. 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 B.Sc. Botany

Sr No	Class/ Program	Course Name/ Title	Outcomes
CO1	F.Y. B. Sc. SEM - I	**Term- I - BO 111 Plant Life and Utilization I**	1. To give information about lower plants and their life Cycle pattern. student are able to know about Non-Vascular plants and vascular plants 2. Understand diversity among algae, fungi, bryophytes, Pteridophytes, Gymnosperms and Angiosperms. 3. Know the biodiversity, morphology, life cycles patterns and their economic importance. 4. Students have to play important role for conservation of flora and fauna
CO2	F.Y. B. Sc. SEM - I	**Term- I - BO 112 Morphology and Anatomy**	1. Understand the habit of the angiosperm plant body. 2. Know the vegetative characteristics of the plant (Root, Stem, Leaves, Inflorescence, Flower, Fruits) 3. Learn about the reproductive characteristics of the plant. 4. Understand the plant morphology 5. To know internal organization of different tissues in Monocot and Dicot plants. 6. To describe Anatomical & Physiological characters related to study of plant. **7.** The knowledge of basic science is the pillars of life science.
CO3	F.Y. B. Sc. SEM - I	**Practical Paper-III**	Students understand practically by handling of plant materials, equipments and apparatus 1. Morphology of Leaf and its modification.

			2. Morphology of root and stem with its modification. 3. Study of Flower morphology , Inflorescence and its types of Inflorescence. 4. Study fruit Morphology and types. 5. Anatomy of Root, Stem and Leaf of Monocot and Dicot 6. Study of diversity of Algae, Fungi, Bryophytes.
CO4	F.Y. B. Sc. SEM - II	**Term- II - BO 112 Plant Life and Utilization II**	1.To Understand the basic concepts and morphology of Pteridophytes, Gymnosperms and Angiosperms. 2.Know the economic importance of Pteridophytes, Gymnosperms and Angiosperms
CO5	F.Y. B. Sc. SEM - II	**Term- II - BO 122 Principles of Plant Science**	1. To know the Biochemical and Biophysical processes in Plant body. 2. 2. To know the phenomenon of growth and effect of different growth regulators on growth. 3. 3. To study the structure of Plant cell and differences between Prokaryotic and eukaryotic cell. 4. 4. To know the different components of cell wall, structure and functions of cell wall, Cell membrane, Chloroplast, Mitochondria, Endoplasmic Reticulum 5. 5. Learn the scope and importance of molecular biology. 6. 6. Understand the process of DNA replication 7. 7. Know the concept of gene organization, Transcription, Translation and role of genetic code in polypeptide formation
CO6	F.Y. B. Sc. SEM - II	**Practical Paper-III**	1. Learn the Life cycle and economic importance of Pteridophytes, Gymnosperms. 2. To learn utilization, economic importance and comparative account of Monocots and Dicots 3. 3. To observe and compaire Prokaryotic and Eukaryotic plant cell. 4. 4. To Study cell division.. 5. 5. To study Plant cell Plasmolysis.
CO7	S. Y. B. Sc. Term I	**BO:211: 81411 Taxonomy of angiosperms and Plant ecology**	Understand the diversity of angiosperms. 1. Understand classification, taxonomic literature, resources of data for Systematics, Binomial nomenclature. 2. The comparative account among the families of

			angiosperms. 3. Use computer in the study of Taxonomy 4. Ecological grouping of plants.
CO8	S. Y. B. Sc. Term I	**BO:212: 81421 Plant Physiology**	1. Know importance and scope of Plant Physiology, Plant water relation, absorption of water, ascent of sap, Transpiration phenomenon etc. 3. Plant growth and plant growth regulators, nitrogen metabolism. 4. Seed dormancy, Physiology of flowering etc
CO9	S. Y. B. Sc. Term II	**BO:221:81412 Plant Anatomy and Embryology**	1. Students understand the scope & importance of Plant Anatomy and Embryology. 2. Know various tissue systems. 3. Understand the normal and anomalous secondary growth in plants and their causes (*Annona*, *Moringa Bignonia*, *Raphanus* and *Dracaena* stem) 4. Performs the techniques in Plant anatomy. 5. Understand structure and development in microsporangium and Megasporangium. 6. Understand microsporogenesis and Megasporogenesis. 7. Understand male and female gametophytes and Know fertilization, endosperm types and embryogeny.
CO10	S. Y.B. Sc. Term II	**BO:222:81422 Plant Biotechnology**	1.Understand scope and application of biotechnology 2. Enzyme used in fermentation technology in the industries. 3. Production and application of single cell protein *Spirulina* and yeast 4. Methods of phytoremediation for environmental sustainability. 4. Learn the advanced techniques in genetic engineering. 5. Methods of gene transfer, applications and crop improvement through genetic engineering
CO11	S. Y.B. Sc	**BO:332: 81432 Practical Paper**	Students understand practically 1. Plant families representing different groups of Angiosperms w. r. t systematic position, morphological characters, floral formula and floral diagram. 2.Know the ecological adaptations like hydrophytes

			and xerophytes 3. Know the vegetation by list count quadrat method. 4. Handling the taxonomic tools and ecological instruments. 5. Determine WHC, pH, DPD and transpiration rate 6. Study of normal secondary growth in stem of Dicots and Monocots. 6. Study of epidermal tissue system and mechanical tissue systems. 7. Study of normal secondary growth in the Stem of *Annona*. 8. Study of anomalous secondary growth in the Stems of *Bignonia* and *Dracaena*. 9. Tetrasporangiate anther and types of ovules. 10. Student performs biotechnological experiments i.e. Citric acid titration and SCP 10. Demonstration of fermentation,
CO12	T.Y. B.Sc. Botany Sem. III	**BO 331: 91413 Cryptogamic Botany**	1. Understand the diversity and Know the systematic position, morphology and structure, understand the life cycle pattern of among • Algae (*Nostoc, Chara, Sargassum* and *Batrachospermum*) • Fungi(*Rhizopus, Saccharomyces, Puccinia* and *Cercospora*) • Bryophytes (*Marchantia, Anthoceros* and *Polytrichum*) • Pteridophytes (*Psilotum, Selaginella* and *Marsilea*). 2. Understand the economic importance of Algae, Fungi, Bryophytes and Pteridophytes. Lower plants are also used as non conventional food sources.
CO13	T.Y. B.Sc. Botany Sem. III	**BO: 332: 91423 Cell and Molecular Biology**	Gain knowledge about Cell Science Cell biology gives knowledge about cell organelles, importance and their function. 1. prokaryotic and eukaryotic cell 2. Understand component of cell is cell wall, Plasma

			Membrane, organelles and Cytoplasmic matrix. 3. Cell organelles w. r. t. ultra structure, chemical composition and functions • Endoplasmic reticulum • Golgi Complex • Lysosomes • Mitochondrion • Plastids • Ribosomes • Micro bodies 4. Learn the scope and importance of molecular biology. 5. Understand the biochemical nature of nucleic acids, their role in living systems, experimental evidences to prove DNA as a genetic material. (Watson & Crick Model) 6. Understand the process of DNA replication, DNA damage synthesis of proteins. 7. Know the concept of gene organization, Transcription, Translation and role of genetic code in polypeptide formation. 8. Gene action and regulation in governing specific functioning and characters
CO14	T.Y. B.Sc. Botany Sem. III	**BO: 333:91433 Genetics and Evolution**	1.Understand the Science of Heredity, Mendelism, laws of heredity 2. Interaction of gene 3. Study of multiple alleles, linkage and crossing over 4. Cytoplasmic inheritance 5. Sex linked inheritance 6. Euploidy, aneuploidy and chromosomal aberrations. 7. Realize the role of genes in evolution of species and theories. 8. Know the population genetics. 9. New varieties must be developed to show resistance to change in climatic conditions.
CO15	T.Y. B.Sc. Botany Sem. III	**BO:334: 91443 Spermatophyta and Palaeobotany**	1. Understand the diversity of angiosperms. 2. Know the origin and classification systems 3. Understand distinguishing features and the comparative account among the families of

			angiosperms. 4. Know the scope of Paleobotany, types of fossils and geological time scale 5. Understand the various fossil genera representing different fossil groups.
CO16	T.Y. B.Sc. Botany Sem. III	**BO: 335: 91453 Horticulture and Floriculture**	1. To understand scope , importance & disciplines of horticulture. 2. To familiar with horticultural zone of Maharashtra & India. 3. To understand different horticultural practices & methods. 4. To understand production technology, harvesting and preservation techniques of fruits, vegetables, Ornamentals, floriculture. 5. Knowledge of horticulture and floriculture is useful for development of small scale industries for the youth
CO17	T.Y. B.Sc. Botany Sem. III	**BO: 336 : 91463 Computational Botany**	1.Understand the techniques of statistics to biological data 2. Collection, Sampling, representation of data and its advantages 3. Measures the mean, mode, median, dispersion methods, correlation and regression of biological data. 4. Probabilities and its theories. 5. Determine test of significance. 6. Seed testing methods, vegetation data and satellite data
CO18	T.Y. B.Sc. Botany Sem. IV	**BO: 341:91414 Plant Physiology and Biochemistry**	1. Know scope and importance of plant Physiology. 2. Understand the process of Photosynthesis in higher plants with particular emphasis on light and dark reactions, C_3, C_4 and CAM pathways. 3. Understand the respiration in higher plants with particular emphasis on Aerobic and Anaerobic Respiration. 4.To understand the Stress Physiology 5. Understand the current status of Biochemistry. 6. Understand the importance of Bio-molecules 6. Recognize the impact of Biochemistry on socioeconomic aspects of life and Industrial

			application of Biochemistry
CO19	T.Y. B.Sc. Botany Sem. IV	**BO: 342: 91424 Plant Ecology And Biodiversity**	1. Know the scope and importance of the ecology, to Provide knowledge about environmental factors and natural resources and their importance in sustainable development. 2. Understand plant communities and ecological adaptations in plants and environmental impact assessment. 3. Learn about loss and conservation of biodiversity, 4. Discover botanical regions of India and vegetation types of Maharashtra. 5.Understand Bioremediation, Global warming and climate change. 6. Knowledge is useful for conservation of natural resources.
CO20	T.Y. B.Sc. Botany Sem. IV	**BO: 343: 91434 Plant Pathology**	1. Understand the scope and importance of Plant Pathology. To give knowledge about plant disease, plant growth, plant metabolism and structure between different groups of plant. 2. Mechanism of disease development and defense mechanism 3. Know the diseases caused by fungal, bacterial, mycoplasma, nematodal and viral pathogens 4. Different control measures of plant diseases
CO21	T.Y. B.Sc. Botany Sem. IV	**BO:344: 91444 Medicinal and Economic Botany**	1. Know about origin, history herbal treatment systems 2. Understand about Ayurvedic, Siddha, Unani, Tibi and Chinese system w. r. t. principles, formulations and plant used. 3. Preparation of crude drugs and adulteration of drugs 4. Understand medicinally important drug plants 5. Know about ethno botany.
CO22	T.Y. B.Sc. Botany Sem. IV	**BO:345: 91454 Plant Biotechnology**	1. Understand the biotechnology scope, significance, To learn advanced techniques and achievement. 2. Fundamentals of totipotency in plant tissue culture techniques. 3. Know the transgenic technology for the improvement of quality and quantity of plant and there by product.

			4. Understand the advantages of in vitro propagation in various areas. 5. Realize the application and importance of plant tissue culture and transgenic plants. 6. Known the working of NCBI and data retrieval tools.
CO23	T.Y. B.Sc. Botany Sem. IV	**BO:346: 91464 Plant Breeding and Seed Technology**	1. Understand the science of plant breeding. 2. To study the different techniques of production of new superior crop verities. 3. Know the seed production, seed certification, seed processing, seed packaging, seed Marketing and seed purity analysis
CO24	Annual Pattern	**BO:347: 91474 practical paper I**	Students understand practically by handling and sectioning plant materials. 1.The range of thallus structure reproductive structure The life cycle pattern in Algae, Fungi, Bryophytes and Pteridophytes 2.Preparation of fixative and stains 3. The Mitosis and Meiosis techniques. 4. Study of polytene chromosome from Chironomus larvae. 5. Isolation of DNA from Cauliflower plant material. 6. Separation of photosynthetic pigment by paper Chromatography method. 7. Demonstration experiments 8. Learn the laboratory techniques of preparation of MS medium 9. In vitro callus induction by using maize embryo. 10. Student know the importance of applications of Biofertilizers. 11. Study of transgenic plants Bt cotton, Bt tomato Bt brinjal
CO25	Annual Pattern	**BO:348: 91484 practical paper II**	1. Student understand induction of tetraploidy in onion root tips in vitro condition 2. Students Estimation of frequency of PTC taste sensitivity in their family, earlobe and rolling tongue 3. Study the problems on gene mapping using three points test cross.

			4. Study of Gymnosperms Pinus and Gnetum w r t morphology, anatomy (root, stem and leaf), male and female cone. 5. Study of eight plant families representing different groups of angiosperms w. r. t. systematic position, morphological characters, floral formula and floral diagram. 6. Identification of plant with help of floras 7. Student prepare artificial key on the basis of vegetative and reproductive characters. 8. Student studies the fossils types. 9. Study of plant vegetation by list quadrat method. 10. Student knows the hybridization technique practically. 11. Induction of polyploidy in *Allium cepa* by colchicines treatment 12. Understand the seed moisture test and sampling equipment photographs.
CO26	Annual Pattern	**BO:349: 91494 practical paper III**	1. Student understand the phenology of fruits, vegetables and flowering crops 2. Student handled garden tools like sprayer, duster, pruning knife, sprinkler etc. 3. Student do practically filling of garden pots for plantation. 4. Know the techniques of propagation like cutting, layering, budding and grafting. 5. Learn the technique of pruning 6. Student understands the cut flower preservation methods. 7. Methods of dry flower making. 8. Student learn statistical analysis of biological data • Mean, mode, median, variance and standard deviation methods • Graphical methods • Student 't' test and X^2 test • Correlation 9. Determine seed germination indices 10 Analysis of satellite data collected on biomass 11. Student prepares PDA culture medium. 12. Student understand Koch's postulates, pure culture techniques,

			13. Student study the fungal, bacterial, viral diseases of crop plants 14. Student studies the fungicides and microbial pesticides. 15. Study of six drug yielding plants w. r. t. macroscopic, microscopic and applications. 16. Student performs Ayurvedic formulations. 17. Know the qualitative test for secondary metabolites. 18. Calibration of microscope and measurement of stomatal index and vein islet number (Micrometry)

Zoology Program Outcomes, Program Specific Outcomes and Course Outcomes Zoology Program Outcomes:

Zoology Programme Outcomes

The Department of zoology of KarmaveerRamraojiAher College is taking efforts for the welfare of the students and their overall development by providing the facilities of ICT like LCD projectors, internet, and computer etc. department has well experience staff which directly benefits the students to develop their career. Hence the department has achieved many success academic stories such as:

Results: Major students completed their B. Sc. with distinction every year. Majorzoology subject's results are 100% with significant increase in the rank.

Department has started Poultry Businesses training programmer in association with Swapnil Agro and Poultry as a three months' certificate course for 50 students each year. As per the requirement of the students these course is started by identify local need of the society. These facilities have provided free off cost to all the students during the academic year 2017-18, 2018-19 and 2019-20. The lectures and practical activities of the course have successfully

completed for the academic year at the institute and the hatchery center of Swapnil Agro and Poultry Wadala, Deola. Due to outbreak of SARS-COV 2, the Novel Corona Virus 2), as a pandemic situation, the examination has conducted online. The department organized one day State level workshop for the farmers, teachers and students.

The workshop was organized on Poultry disease and Management dated-30.12.2015. Department has provided Mementos and certificate of Poultry to the dignities, farmers, students and teachers to attract over the Agro base business.

Departments organize academic tours as per the norms of the syllabus. Student visits to water treatment plant, bird sanctuary, National park, water purification plant, sea shores, government hospitals, pathology laboratory. The Department has arranges the study tours every year, for the year the Study tour of First was arranged to Nadurmadhmeshwar National Bird Sanctuary, while the Academic tour of Third year B. Sc. Zoology Student's and Second Year Student was arranged at Vajrashawari, Ganeshpury, Arnala Fort, Beach, and Vasai Fort. Students also visited to Water Purification Plant, Virar Mumbai. Time to time the department was also arranged local visits of the students at Pathology Labs, Government cottage hospital, Kalwan. Like every academic year the department has arranged the Brigdge Course for the students of First Year to bridge the gap between the students, teachers and society, to remove the subject phobia, bring the students more closely to solve the social problems to achieve national integrity.

For the first year and second year B.Sc students the department had given project works. The department gives them different themes for which are concern with the surrounding of the villages. So the students become motivated and interesting collected the data of their surroundings such as type of birds, fishes, insects, pests, snakes etc. these projects gives them the way of understanding and natural biodiversity.

Zoology Subject Outcomes

1. Students gain knowledge and skill in the fundamentals of animal sciences, understands the complex interactions among various living organisms

2. Analyze complex interactions among the various animals of different phyla, their distribution and their relationship with the environment
3. Apply the knowledge of internal structure of cell, its functions in control of various metabolic functions of organisms.
4. Understands the complex evolutionary processes and behavior of animals
5. Correlates the physiological processes of animals and relationship of organ systems
6. Understanding of environmental conservation processes and its importance, pollution control and biodiversity and protection of endangered species
7. Gain knowledge of Agro based Small Scale industries like sericulture, fish farming, butterfly farming and vermicompost preparation.
8. Understands about various concepts of genetics and its importance in human health
9. Apply ethical principles and commit to professional ethics and responsibilities in delivering his duties
10. Apply the knowledge and understanding of Zoology to one's own life and work
11. Develops empathy and love towards the animals

Program Specific Outcomes:

1. Understand the Animal Biodiversity
2. Understand the nature and basic concepts of cell biology, genetics, taxonomy, physiology, ecology and applied Zoology
3. Analyze the relationships among animals, plants and microbes
4. Perform procedures as per laboratory standards in the areas of Taxonomy, Physiology, Ecology, Cell biology, Genetics, Applied Zoology, Clinical science, tools and techniques of Zoology, Toxicology, Entomology, Nematology Sericulture, Biochemistry, Fish biology, Animal biotechnology, General Pathology and Public Health and Hygiene.
5. Understand the applications of biological sciences in Apiculture, Aquaculture, Agriculture, Fishery Science and Sericulture

6. Gains knowledge about research methodologies, effective communication and skills of problem solving methods
7. Contributes the knowledge for Physical, mental and Social Development of Public and Nation building.

Course Outcomes:

Sem I. (for FYBSc New Syllabus 2019 Pattern and for Sem I to IV for SY and TY BSc Zoology As per 2013 Pattern)

Zoology Paper I, Animal Systematic and Diversity – Invertebrates for I, (ZO-111, ZO-121 FYBSc 2019 Pattern) II(ZY-211,ZY-221) and III rd (ZY-331,) year Zoology Course

Learning outcomes for the course:

1. The student will be able to understand classify and identify the diversity of animals.
2. The student understands the importance of classification of animals and classifies them effectively using the six levels of classification.
3. The student knows his role in nature as a protector, preserver and promoter of life which he has achieved by learning, observing and understanding life.
4. Imparts knowledge regarding the various Invertebrates species and the regulatory processes to safeguard them
5. With the study of this paper students gain knowledge in the areas of responses to Systematic position, general organization and affinities of Ctenophora and Nemertea
6. Systematic position, general organization and affinities of Rotifera;
7. Systematic position, general organization and affinities of Hemichordata

8. The students will be well equipped to become very competent in research or teaching fields after completion of this course
9. Describe general taxonomic rules on animal classification (For FY, SY, TY BSC)
10. Classify Protista i.e. Phylum Protozoa up to phylum using examples with examples (for FYBSC)
11. Useful and harmful Protozoans
12. Classify Phylum Porifera, Coelentarata/Cnidaria, Platyhelminthes, with two examples of each class (for FYBSC)
13. Describe Phylum Nematoda and give examples of pathogenic Nematodes, Trimatodes and Cestodes and their economic importance (for FYBSC)
14. Classify Phylum Arthropoda, Mollusca and Echinodermata with taxonomic keys and two example of each class (for SYBSC)
15. Classify Phylum Mollusca with two examples of each class (SY & TYBSC)
16. Animal for the type study- Paramoecium, Star fish, Pila (For I, II and III year respectively)

ZO-112 Animal Ecology Zoology Paper II (FYBSC) credit based syllabus

Learning outcomes for the course:

1. The learners will be able to identify and critically evaluate their own beliefs, values and actions in relation to professional and societal standards of ethics and its impact on ecosystem and biosphere due to the dynamics in population.
2. To understand anticipate, analyse and evaluate natural resource issues and act on a lifestyle that conserves nature.
3. The Learner could be understand and appreciate the diversity of ecosystems and applies beyond the syllabi to understand the local lifestyle and problems of the community.
4. The learner will be able to link the intricacies of food chains, food webs and link it with human life for its betterment and for non-exploitation of the biotic and abiotic components.
5. The working in nature to save environment will help development of leadership skills to promote betterment of environment.
6. **They understand,**

1. Community/Ecosystems
2. Environment
3. Biomes
4. Pollution
5. Interaction of biota and abiota
6. Population and Environmental carrying capacity

Sem II

Zoology Paper I

Animal Systematics and Diversity – Vertebrates for FY, SY, TY BSc. Zoology

1. Imparts conceptual knowledge of vertebrates, their adaptations and associations in relation to their environment
2. Classify phylum Proto-chordates to Mammalia with examples
3. Complex Vertebrate interactions
4. Animal Type Study Frog, Scoliodon, Calotes (for I, II & III Year Respectively)

ZO-122 FYBSC Paper II for Cell Biology (Credit System) (As per 2019 Pattern)

1. The learner will understand the importance of cell as a structural and functional unit of life.
2. The learner understands and compares between the prokaryotic and eukaryotic system and extrapolates the life to the aspect of development.
3. The dynamism of bio membranes indicates the dynamism of life. Its working mechanism and precision are responsible for our performance in life.
4. The cellular mechanisms and its functioning depend on Cell membranes and structures. They are best studied with microscopy.
5. Structural and functional aspects of basic unit of life i.e. cell concepts
6. Theories of Evolution Knowledge of eras and evolution of species

ZY- 212 SYBSC Paper II Applied Zoology Fisheries and Agricultural pests and their control Sem I (As per 2013 Pattern)

1. Understands concepts of fisheries, fishing tools and site selection
2. Aqua culture systems, induced breeding techniques, post harvesting techniques
3. Understands the various types of diseases in fishes their prevention and control
4. t is also important to draw attention to responsibility of individuals for the application of plant protection measures, which is prescribed by each state. This responsibility exists because of the danger of pesticides for humans, animals and the environment.
5. Crop protection is the science and practice of managing pests, plant diseases and other pest organisms that damage agricultural crops. Pesticides help farmers to reduce crop damage from pests and increase food production. They're very important as they improve the quality and yield of agricultural produce.
6. Students understand the Integrated Pest Management (IPM) an economically viable, environmentally sound and socially acceptable approach to crop protection—as defined by the International Code of Conduct on Pesticide Management. It is the mission to provide with safe and effective technologies to protect against adverse effects caused by pests, diseases and weeds. Our member companies

ZY-222 SYBSC Paper II Applied Zoology Apiculture, Sericulture: Sem II (As per 2013 Pattern)

1. Honey bees and the business of beekeeping have profound economic importance for global agricultural production.
2. Identify and describe the fundaments and scientific basis of beekeeping
3. Recognize biological principles applicable to many organisms by using the honey bee as a study subject
4. Appreciate the importance of honey bees as beneficial insects involved in food production and in ecosystem sustainability
5. Explain management practices involved in keeping honey bees healthy and productive
6. Search, interpret, discuss and communicate in writing aspects of scientific literature relating to honey bee biology
7. Gives knowledge of silk worm rearing

8. Mulberry cultivation
9. Pests and diseases associated with silk worm and mulberry, Various process involved in silk production
10. Sericulture Gives knowledge of silk worm rearing, mulberry cultivation, pests and diseases associated with silk worm, mulberry and various process involved in silk production. CO2 It is an agro based cottage industry in India that enables them to get self-employment
11. Sericulture is a comprehensive subject that gives in depth knowledge of the study of silkworms both physiological as well as commercial purposes including the various processes involved in the formation of silk.
12. Students gain knowledge about various systems study of silkworms and cocoons, other defective cocoons
13. Reeling and significant diseases seen in the silkworms
14. Students feel confident in teaching Sericulture as well as executing research projects

ZO-332 Learning Outcomes Mamalian Histolopgy Zoology Paper II Sem III

1. Have an enhanced knowledge and appreciation of mammalian Histology;
2. Understand the Histological details and functions of important physiological systems including the cardio-respiratory, renal, reproductive and metabolic systems by s;
3. Understand how these separate systems interact to yield integrated physiological responses to challenges such as exercise, fasting and ascent to high altitude, and how they can sometimes fail;
4. Be able to perform, analyze and report on experiments and observations in Histology;
5. Be able to recognize and identify principal tissue structures.
6. Name the instruments and techniques used to prepare and study histological specimens.
7. Identify various types of stains & micro techniques
8. Identify and differentiate between different types of epithelium, connective tissue cells, connective tissue proper & bone cells
9. Use the sources of biomedical information to remain current with advances in knowledge and practice
10. Appreciate the importance of lifelong learning and show a strong commitment to it.

ZY-333 Learning outcomes of TYBSC Zoology Paper III Biological Chemistry: Sem

III (As per 2013 Pattern)

1. Follow safety procedures and demonstrate proper use of personal protective equipment. Demonstrate laboratory techniques that relate to investigations of the physical or chemical properties of different classes of molecules. Apply principles of chemistry to the observations of substances experiencing physical or chemical changes.
2. Recognize the structures and functions of biomolecules that form the basis of what we understand to be living organisms.
3. Learn basic principles of structural and functional relationships of biological molecules.
4. Discuss biochemistry research, experiments, and techniques in relationship to biomolecules and structures
5. Be able to search, read, and understand the applicable primary literature
6. Design and propose experimental approaches to solve biochemical questions
7. Understand and describe the relationship between chemistry and biology in metabolic pathways
8. Rationalize the transfer of energy in living systems on the molecular level.
9. Discuss biochemistry research, experiments, and techniques in relationship to metabolic reactions
10. Be able to search, read, and understand the applicable primary literature
11. Analyze data and organize biochemical information
12. Design and propose experimental approaches to solve biochemical questions

ZY-334 TYBSC Zoology PaperIV Environmental Biology and Toxicology Sem III (As per 2013 Pattern)

1. Imparts knowledge to the student regarding environment and conservation biology.
2. Gains knowledge in the areas of responses to Laws of limiting factor, Laws of minimum, Laws of Tolerance and Tragedy of commons
3. Types of ecosystem – freshwater, marine and terrestrial,
4. Biodiversity and Conservation increase awareness and understanding of how human life depends on preserving animal species and natural ecosystems.
5. Population characteristics and dynamics – conceptual approach

6. It is a discipline overlapping with biology, chemistry, medicine that involves the study of toxic ants, their mechanism of action.
7. It involves the study of the adverse effects of chemical substances on living organisms.
8. Skill development in environmental and occupational Toxicology
9. It provides opportunities for students research projects, internships in assessing the effects of toxic Pollutants on the environment and in the food chain
10. Management actions that are used to mitigate threats to biodiversity, including selecting nature reserves, connectivity and wildlife corridors, ecosystem restoration and control of pest plants and animals.

ZY-335 TYBSC Zoology Paper V Parasitology Sem-III

1. The capabilities developed in this course include knowledge, technical expertise and critical analysis.
2. On successful completion of this course students get knowledge and understanding of the basic biology and life cycles of human parasites, human parasitic infections, including epidemiology, clinical features, laboratory diagnosis, treatment and prevention.
3. Acquired a basic level of skill in the laboratory diagnosis of human parasitic infections (especially those caused by intestinal parasites) and ability to critically analyze the results of laboratory investigations, the ability to prepare scientific study of diseases
4. Have a basic understanding of the main concepts and definitions within the discipline.
5. Have an overview of the major taxonomic groups of parasites occurring in vertebrates and have insight into general biological adaptations that characterize each parasite group.
6. Gain insight into parasites' population ecology, including factors affecting infection pressure and spread rate of a parasite in a host population.
7. Understand how important parasitic properties are influenced by evolutionary processes.
8. Become familiar with how parasites affect physiological, behavioral and ecological adaptations in the host.
9. Have an overview of key research questions in parasitology, and be able to present these orally and in writing.

ZY-336 TYBSC Zoology Paper VI General pathology, Sem III- (As per 2013 Pattern)

1. Understands about composition of blood, blood born diseases, autopsy and biopsy
2. Techniques of biopsy, autopsy and immunological techniques
3. Types of immunity, antigens-antibodies and their properties
4. Understanding of pathology of diseases caused by various microorganisms such as bacteria, virus, parasites and fungus
5. Gives knowledge related to the techniques involved in detection of various diseases
6. Pathology associated with various diseases
7. Practical skills of conducting basic clinical lab experiments
8. Application of knowledge of clinical science and pathology to one's own life
9. Growth curves and pyramids; sigmoid curve, J curve and hyperbola; logistic equation and concepts relating to growth
10. The students will be well equipped to become very competent in research or teaching fields after completion of this course

ZY341 TYBSC Zoology Paper I Biological Techniques Sem IV(As per 2013 Pattern)-

1. Students gain knowledge about various tools & techniques used in biological systemsand gives them insight about their use in research
2. Useful to teaches them to use the best methods in their research projects
3. Students gains knowledge about Zoology Practical methods like measures of central tendencies
4. Learns about stains, staining methods, Microtome types, Preparation of chemicals

ZY-342 Learning outcomes of TYBSC Zoology Paper II Mammalian Physiology and Endocrinology (Sem IV)

1. Seeks to understand the mechanisms that work to keep the animals and human body alive and functioning Physiological and biochemical understanding through scientific enquiry into the nature of mechanical, physical, and biochemical functions of animals and humans, their organs, and the cells of which they are composed
2. Interactions and interdependence of physiological and biochemical processes
3. Students are taught the detailed concepts of digestion respiration excretion the functioning of nerves and muscles

4. Students gain fundamental knowledge of animal physiology
5. Students will gain skill to execute the roles of a biology teacher or medical lab technicians with training as they have basic fundamentals
6. Students learn the concepts of endocrine systems and homeostasis a brief account of genetics and organic evolution.
7. This course helps students to gain fundamental knowledge in these topics CO3 Students gain fundamental knowledge of physiology and endocrine systems CO4 Students gain fundamental knowledge of physiology of homeostasis
8. Understanding of basic concepts of genetics, laws of inheritance and central dogma of biology
9. Understanding of genetic basis of evolution, human karyotyping and speciation
10. Imparts knowledge about various metabolic and physiological mechanisms of the human body.
11. Understands about neurophysiology and receptors
12. Gain knowledge about hormones and bioluminescence
13. Understanding of stress physiology and endocrine mechanisms will allow them to control their stress and emotions there by diverting their energy towards the positive nation building activities

ZY-343 Learning outcomes of TYBSC Paper III Genetics and Molecular biology Sem IV(As per 2013 Pattern)

1. Describe the fundamental molecular principles of genetics
2. Mendelian and non Mendielian inheritance
3. Understand the structure and function of DNA, RNA and protein
4. Explain the way in which genes code for proteins
5. Understand the relationship between phenotype and genotype in human genetic traits.
6. Describe the basics of genetic mapping
7. Understand how gene expression is regulated
8. Detailed understanding of chromatin structure and different levels of its organization
9. Description of higher order structure of chromatin, chromatin-territories; intra-nuclear spatial organization of chromatin
10. Awareness of brief history of epigenetics and key concepts

11. Detailed knowledge chromatin modifications and their mechanism of action, concept of 'histonecode' hypothesis inthe phenomenon of epigenetics.
12. Understanding of RNAi and heterochromatin assembly, role of noncoding RNAs in epigenetic regulation
13. Engage in review of scientific literature in the areas of biomedical sciences
14. Critique and professionally present primary literature articles in the general biomedical sciences field
15. Understanding Hardy Weinberg's Principle for population study
16. Explain the fundamental structure, properties and processes in which nucleic acids play a part.
17. Discuss the molecular mechanisms by which DNA controls development, growth or morphological characteristics of organisms.
18. Explain the principles and laws of inheritance at the cell, individual and population levels.
19. Explain the emergence of mutations and their influence on the survival of individuals and species with the proposal of the method of targeted introduction of mutations due to the creation of new gene variations that can be used for further research or application in industry.
20. Explain the principles of cloning and genetic manipulation and their application in genetic analysis.

ZY-344 Learning outcomes of TYBSC Paper IV Organic Evolution: (As per 2013 Pattern)

1. Define Geological Time Scale and describe zoogeographical Realms.
2. Describe the barriers, dispersals and their impact on animal Distribution
3. Describe the adaptive features of both primary and secondary aquatic vertebrates.
4. Describe the adaptive features of desert reptile and mammals
5. Origin of life and experiments for supporting that idea.
6. Describe the Theory of Evolution considering Darwinism and Modern Synthetic Theory
7. Write down the adaptive significance of coloration and mimicry
8. Describe the Isolating mechanisms, modes of speciation, Biological & Evolutionary Species concept
9. Write down the Hardy-Weinberg equilibrium and factors affecting it with special reference to genetic drift.

10. A detailed understanding of evolutionary strategies and morphological innovations, gene and genome duplication, evolutionary genetics, Concept behind genetic disorder, gene mutations- various causes associated with inborn errors of metabolism
11. Imparts knowledge regarding the various theories of evolution, evolutionary process such as variation, speciation, natural selection, origin of primates and man
12. Understanding of origin and salient features of Ostracoderms to Actinopterygii, adaptive radiation of Amphibians, Reptiles, birds and Mammals
13. Gains knowledge of functional anatomy of vertebrates from fishes to mammals
14. Understanding of evolutionary significance of internal fertilization, neoteny and paedogenesis
15. Distribution of fauna in different realms interaction
16. Understand Animal behavior and response of animals to different instincts
17. Various kinds of Animal adaptations

ZY-345 TYBSC Paper V General Embryology Sem IV (As per 2013 Pattern)

1. Application of DNA technology and molecular biology for research
2. Provides students insight into maintaining healthy relationships with their opposite gender and allows them to make right choice about their life partner thus preventing congenital diseases.
3. Information about history and basic concepts of developmental biology.
4. Illustration of model systems: invertebrate and vertebrate model organisms.
5. Identification of developmental genes: spontaneous and induced mutation, mutant screening, developmental mutations in Drosophila.
6. Elucidation of early embryonic development of invertebrates and vertebrates.
7. Concept of axis specification in Drosophila, role of maternal genes, patterning of early embryo by zygotic genes.
8. Concepts of organogenesis in invertebrates and vertebrates
9. Illustration of postembryonic development: growth- cell proliferation, growth hormones; aging genes involved in alteration in timing of senescence.
10. Understanding of process of regeneration in Hydra and salamander.
11. Explanation of embryonic stem cells and their applications.

12. Description of medical implications of developmental biology, genetic errors of human development, the nature of human syndromes
13. Study of gene expression and human disease– inborn errors of nuclear RNA processing, inborn errors of translation.
14. Knowledge about genetics, developmental biology and organogenesis.
15. Gains knowledge about gametogenesis, cleavage mechanisms, gastrulation and role of hormones in metamorphosis and regeneration

ZY-346 TYBSC Zoology Paper VI Public Health and Hygiene, Sem IV- (As per 2013 Pattern)

1. Demonstrate some knowledge and understanding of the wider determinants of health and ill-health
2. Demonstrate some knowledge and understanding of the roles of people and agencies who undertake work in the promotion of public health
3. Demonstrate an awareness of the debates and dilemmas that may arise from the promotion of public health.
4. Explain the history and philosophy of public health as well as its core values, concepts, and functions across the globe and in society.
5. Identify the methods, and tools of public health data collection, use, and analysis and why evidence-based approaches are an essential part of public health practice.
6. Identify the basic processes, approaches, and interventions that identify and address the major health-related needs and concerns of populations.
7. Relate the underlying science of human health and disease to opportunities for promoting and protecting health across the life course.
8. Identify the socio-economic, behavioral, biological, environmental, and other factors that impact human health and contribute to health disparities.

Students complete their practical work of all above courses in the laboratories. The practical knowledge of above courses increases the curiosity about the courses.

Department of Mathematics

Course Outcomes of B.Sc Mathematics:-

- Students will demonstrate the ability to solve financial math problems.
- Students will demonstrate the ability to solve exponential growth and decay problems.
- Students will demonstrate the ability to solve basic problems in probability and statistics.
- Students will demonstrate the ability to think critically, research, and reason. (Ethical Leadership)
- Students will recognize and differentiate among diverse cultures through the history of mathematics.
- Students will engage in activities directly benefitting the broader community.
- Students will demonstrate an understanding of the common body of knowledge in mathematics.
- Students will demonstrate the ability to apply analytical and theoretical skills to model and solve mathematical problems.
- Students will demonstrate the ability to analyze data and draw appropriate statistical conclusions.
- Students will demonstrate the ability to effectively utilize a variety of teaching techniques and classroom strategies to positively influence student learning.
- Students will acquire problem-solving skills in a broad range of mathematics.
- Students will be able to produce and judge the validity of rigorous mathematical arguments.
- Students will be able to communicate mathematical ideas and arguments, both written and orally.
- Students will be prepared to use mathematics in their careers
- The ability to communicate and interact effectively with different audiences.
- Students will be able to solve arithmetic, algebraic, geometric, equations, functions, and problems using appropriate technology.
- Students will be able to represent mathematical information numerically, symbolically, graphically, verbally, and visually using appropriate technology.
- **Programme Outcomes:-**

At the end of B.Sc Mathematics Programme,Students

- Acquires the ability to understand & analyze the problems.
- Develops the skill to think critically on abstract concepts of Mathematics.
- Analyses the situation, make a Mathematical problem & find it's solution.
- Formulates & develops Mathematical arguments in logical manner.
- Provides a systematic understanding of the concepts & theories of Mathematical & computing their application in the real world.
- Enhances Logical Reasoning Skills, Arithmetic Skills, Aptitude Skills, Communication Skills,Self Confidence for better employability.
- The mathematical maturity of students in their current and future courses shall develop.
- The student develops theoretical, applied and computational skills.
- The student gains confidence in proving theorems and solving problems.

Programme Specific Outcomes:-

- Use the basic concepts of divisibility, congruence and their applications in basic algebra.
- Prove results involving divisibility and greatest common divisors .
- Understand the concept of limit of a function, use it to prove properties of continuous functions & the derivative of a function.
- Ability to solve differential equations of first order using graphical, numerical & analytical methods.
- Familiarize characteristic roots & characteristic vectors.
- Ability to compute the area & volume by applying the techniques of double & triple integrals.
- Students learn analysis of multivariable functions, continuity, and differentiability.
- learn the concepts of multiple integrals and their Application to area and volumes
- Learn the methods and properties of Laplace transform and Inverse Laplace Transform, apply them to solve Linear Differential equations.
- Apply the fundamental concepts of Fourier series, Fourier Sine series, Fourier Cosine series to find series representation of irrational numbers.
- Ability to work within vector spaces & to distill vector space properties.
- Ability to manipulate linear transformations & to distill mapping properties.
- Use the concept of basis and dimension of vector spaces linear dependence and linear independence,to solve problems.

- Use the concept of inner product spaces to find norm of vectors, distance between vectors, check the orthogonality of vectors, to find the orthogonal and orthonormal basis.
- Apply the properties of linear transformations to linearity of transformations, kernel and rank of linear transformations, inverse transformations to solve the problems of matrix transformations,change of basis.
- Calculate a definite integral using an appropriate numerical method & find roots of functions.
- Derive numerical methods for various mathematical operations & tasks, such as interpolation,differentiation,integration.
- Ability to solve the problems using Newton forward & Newton backward formula.