DEPARTMENT OF BOTANY

B. Sc Plant Science (Core) Programme

Programme out come (PO)

PO 1 – Acquisition of scientific knowledge on the world in and around us particularly living organisms

PO 2 – Development of scientific temper and readiness to learn and research on related / intersted subjects.

PO 3 – Learn to use digital platforms for the collection of information synthesis and dissemination of knowledge.

PO 4 – Training to develop practical skills to observe, document various subjects in nature and laboratory.

PO 5 – development of intellectual skills viz. cognition, assimilation, analysis and problem solving

PO 6 – Inspire to undertake socially relevant subject for study and preparedness for life-long learning.

Programme Specific out come (PSO)

1. students can acquire the knowledge on the dynamics of nature with special emphesis on Biota and conservation strategies

2. Comprehensive indoor and out doorstudeis on microbes to angiosperms leading to better learning on Biodiversity

3. Origin, evolution and inter relationship of plants and microorganisms with special reference to economic importance are to be studiedduring the programme

4. Students can learn about the cellular, molecular, chemical geneticalbasis of life and also thevital metabolic processes involved in the growth and development of plants.

5. Familiarise with the tools, techniques and methods to reveal biological process through research methododology, biotechnology and bioinformatics.

6. acquaitained with intetellectual property rights, numerical skills, entrepreneurship development and related disciplines

7. students acquire the abilty to identify morethan 200 plants under 20 angiosperm families providing illustrations, description and herbaria according to the standard internationally accepted system of classification.

Course outcome(CO)

BSc Plant Science programme offers 12 core courses 4 general courses, 4 complementary courses, 4 core practicals, 1 complementary practical. The programme specific out come of the course is as follows

- **Methodology & Perspective of science**:
  - Understand the concepts of science- methods and methodology of forming scienfic concepts, theories and laws
  - Students will get familiarize with different methods and methodologies in research and laboratory procedures and help to inculcate research aptitude in them.
  - Get to know the process of publishing a research paper in scientific journals.
  - Make the students aware of the importance of Ethics, honesty and transperancy in research.
  - Intellectual property rights, patents, plagiarism *etc.* are introduced to the students.
  - Biostatistics is one module with helps the students to understand how to test a hypothesis.
  - Students get the ability to solve problems related to methods to represent data(three methods), 4 methods to measure dispersion, 3 methods to measure central tendacy.
  - Students acquire the knowledge to prepare three stains and two fixatives.
  - Familiarise with the process of serial section and permanent slide preparation.
- **Plant Anatomy & Embrology**:

- Students are expected to appreciate the internal celluar structure and developmental aspects of the plant.
- Acquire the knowledge about the primary and secondary structure of plant parts of 9 plants.
- Gain the knowledge about the anomaly in secondary structure of 4 plants.
- Familiarise with the developmental aspects of dicot and monocot plants.
- Get the ability to identify different types of ovules, anther pollen grains, embryos etc.

- **Algae, Fungi, lichen, Bacteria, Virus & Plant diseases**:
  - Students are expected to familairaize with lower froms like thallophytes and microbes.
  - Students get the ability to identify, describe and illustrate 10 algae, 9 fungai, 1 lichen and gram positive bacterium.
  - Get an outlook about the diversity in plant kingdom by studying the diversifies groups in thallophyta.
  - Familiarize with 12 plant disease systems and disease triangle.
  - Pathology module may help them to get the ability to identify 12 dieseases, causative organisms and its remiedial measures.
- **Bryophytes , Pteridophytes, Gymnosperms & Paleobotany**:
  - Familiarise with structure and developmental features cryptogames.
  - The evolutionary line of plant kingdom may be appreciated and apprehended.
  - Get the ability to identify, illustrate and describe 3 bryophytes, 5 pteridophytes, 3 gymnosperms and 4 fossil gymnosperms.
  - Students get an insight about the link of missing evolutionary data through Palaeobotany .
- **Taxonomy & Morphology of Angiosperms**:
  - Classification, identification and namimg of plants help the students to observe nature and appreciate the herbalists and taxonomists who contributed to the wealth of knowledge.
  - To recognise the major families of angiosperms and their phylogenetic relationships

- Understanding of terminology, identify, illustrate morphology of stem root and leaves.
- To familize with the use of taxononic keys and taxonomic literatures
- Get the ability to identify indigenous plants and assign to 20 families.
- Acquire the knowledge to identify, illustrate and describe plants come under 20 angiosperm families.

- **Phytogeography, Ethnobotany & Economic Botany:**
  - The diverse soil and land forms and connection between them are comphrended which will give the student an over view of the origin and dispersion of plant kingdom.
  - Knowledge about medicinal plants used by of adivasi community is expectedto give an awareness of conservation and sustainable development in modern days.
  - Students learn the binomeal , family and morphology of the useful part of econimically important 102 plants and 6 ethnobotanically important plants.
- **Physiology & Biochmistry:**
  - familiarise with the cataboilism and anabolism of 5 important biomolecules in plants.
  - Understamd the structure and biological function of major macromolecules in plant cell.
  - Get the ability to identify the presence of starch, sugar, glucose and protein in a sample.
  - Physiological phenomena are expected to be appeciated by illustrating the classic experiments conducted by scientists.
  - Expertise in setting 11 physiological experiments to demonstarte the basic physiological phenomena/ proecesses.
- **Cytology, molecular Biology & Bioinformatics:**
  - The outcome of the paper is the awareness about the DNA, Central dogma, cell cyle and its importance indifferent human diseasesincluding cancer.
  - Get a detailed knowledge about structure and function all cell organelles.
  - Familiarise with the cell devision types.
  - Acquire the ability to identify, illustrate different stages of mitosis.

- The students get the basics of data bases and its use by bioinformatics module.

- **Genetics, Evolution & Ecology:**
  - The classic fileds of life science will help the students to understand the process of life and the inter connections of micro and macro molecules of the life.
  - Understand the gene action and interaction and phenotypic expression of character.
  - Get the ability to solve problems related to monohybrid, dihybrid , linkage –cross over, study of population by quadret method.
  - Get the awareness of types of pollution, pollutants, harmful effects, remedial measures and strategies for sustainable development.
  - Understand the inter relationship between biotic and abiotic conponents of ecosystem by learning biogeocyles.
  - Environmental awareness and protection strtegies are pickedup.
- **Horticulture & Plant Breeding:**
  - The techniques of vegetative propagation and the breeding techniques are learned.
  - Get the knowledge of setting indoor, out doorgarden by learning gardening techniques including bonsai.
  - Understand the theory of mushroomcultivation
- **Biotechnology (Elective paper 1):**
  - Students get the basic idea about micropropagation and tissue culture.
  - Modern techniques and technologies used in research are picked up and basics to the most advancedmethodolgies in the field is familiarised.
  - Acquitained with the advanced sequencing methods, molecular markers , bar coding, finger printing techniques
  - Familiarise with the fields in which biotechnology can be used for human life improvement
- **Medicinal plants (Elective paper II):**
  - Comprehensive study about the medicinalplants used in ayurveda and folk medicines
  - Get to know about the methods of conservation of medicinal plants in natural as well as laboratory conditions.

- Familiarise with the principles of pharmacognosy and its scopes.
- Get the detailed knowledge about the production of vegetable drugs.

- **Foresty (Elective paper III):**
  - Get the knowlegde about differenttype of forest types in India
  - Familiarise with the concept of silviculture,its scope and relevance
  - Acquire the knowledge of differenttypes of wood, and its identification
  - Get to know about the forest resourses its utilization, sutainable development strategies, agroforestry and programmes and schems for aforestation.
- **Mushroom cultivation (Open Course):**
  - Hands on training in mushroom cultivation help the student to accure a life skill.
  - Get the basic knowledge about the fungal life cycle and its economic importance.
  - Acquire the ability to cultivate mushroom by themselves.
- **Numerical Skill (Genral Course):**
  - Life science students usually not used to study mathematics but in this programme mathematics is includedwith help them to compete with other students with science back ground.
- **General informatics:**
  - Basic Computer knowledge is gained.
  - Familiarise with the architecture and functionality of personal computers, different computer programmes and its evolution
  - Gain prpficiency in word processing, excel, power point
  - Understand the Information technology , its componants and applications.
  - Get the knowledge about cyber ethics, cyber security, cyber laws, cyber crimes, and cyber additions.
  - Familiarise with e- waste management and green computing
  - Get the knowledge about different programmimg softwaresin use.
  - Familiarise with the academic networks.
- **Intellectual property rights:**
  - Patents plagiarism, copy rights etc are learned
  - Get awareness of acquiring the patent and copyright for their future innovative works

- Get the knowledge of registration procedure of their intellectual works.
- Get the abilty to identify different types of IPR and laws regarding to it.

- **Entrepreneurship:**
  - The students will get the knowledge how to market the product if they choose that filed.
  - Get the basic knowledge about the entrepreneurship and different strategies to start a new business.