

# GOVERNMENT SHIVALIK COLLEGE NAYA NANGAL

## DEPARTMENT OF BOTANY

B.Sc (Botany) Part -1 (semester I)

Session - 2021-22

SR NO	Course code	PAPER	COURSE OBJECTIVES	COURSE OUTCOME
1	SCIB1117T	DIVERSITY OF MICROBES	This course aims to increase the understanding of the students about the diversity of lower plants, their classification, structure and growth.	The students will develop understanding about the diversity, identification, classification, life cycles and economic importance of lower plants.
2	SCIB1118T	DIVERSITY OF CRYPTOGAMS	The course focuses on morphology, anatomy, reproduction and life cycles and economic importance and bryophytes and pteridophytes.	The students develop the basic understanding of important characteristics, anatomy, reproduction and along with economic importance of these groups
3	SCIB1119L	LAB	Gram staining of bacteria Study of bacterial disease w.r.t. Causal organisms and symptoms Study of viral disease w.r.t. Cause organisms and symptoms Study of algae, fungi, bryophytes and pteridophyte	The students will develop understanding about the diversity, identification, classification, life cycles and economic and importance of lower plants.

# GOVERNMENT SHIVALIK COLLEGE NAYA NANGAL

## DEPARTMENT OF BOTANY

B.Sc (Botany) Part -I (semester II)

SR NO	Course code	PAPER	COURSE OBJECTIVES	COURSE OUTCOME
1	SCIB12171	CELL BIOLOGY	The objective of the present course content is to provide a foundation and background in cellular entities of plants, cell structure and its organelles in relation to functions, Chromosome organization, morphology, alteration	About the cellular entities including infective particles comprised the observations which challenge the established dogmas, such as, cell being the basic unit of life or higher plants are multicellular rather than cellular, and current state of knowledge about the plant cell structure and their turn over, starting from cell wall to chromatin, in relation to their functions. Students will understand the role of plasma membrane in microbes and plants Student will focus on various components of the eukaryotic nuclear and organelle genome, with special reference to plastids and mitochondria
2	SCIB1218T	GENETICS AND EVOLUTION	The paper deals with Mendelian and non-Mendelian inheritance, quantitative genetics, molecular markers and linkage mapping, prokaryotic and eukaryotic genome-structure, gene function and regulation, cytogenetic and crop evolution.	They understand the pattern of inheritance in various life forms. They develop a strong fundamentals basics for further molecular studies
3	SCIB1219L	Lab	To gain knowledge about 'cell science' Understand the cell organelles Understand the biochemical nature of nucleic acids, experimental evidence to prove DNA as a genetic material	Learn the scope and importance and their role in living system cell and biology and genetics

# GOVERNMENT SHIVALIK COLLEGE NAYA NANGAL

## DEPARTMENT OF BOTANY

B.Sc (Botany) Part -II (semester III)

Session : 2021-22

SR. NO	COURSE CODE	PAPER NAME	COURSE OBJECTIVES	COURSE OUTCOME
1	SCIB2318	DIVERSITY AND SYSTEMATIC OF GYMNOSPERMS	<ul style="list-style-type: none"><li>This course aims to add to understanding of the students about the diversity of plants, their Description, Identification, Nomenclature and their classification including recent advances in the field</li></ul>	<ul style="list-style-type: none"><li>The students will know about the systematic position of Genera, Species and Families</li><li>The students develop knowledge about plant nomenclature</li></ul>
2	SCIB2319	DIVERSITY AND SYSTEMATIC OF ANGIOSPERMS	<ul style="list-style-type: none"><li>This course aims to add to understanding of the students about the diversity of plants, their Description, Identification, Nomenclature and their classification including recent advances in the field.</li></ul>	<ul style="list-style-type: none"><li>The students will know about the systematic position of Genera, Species and Families</li><li>The students develop knowledge about plant nomenclature</li></ul>
3	SCIB2320	Lab	<ul style="list-style-type: none"><li>Microscopic and charts slides Study of T.S and L.S shoot root leaf and reproductive structures of Gymnosperms and Angiosperms</li></ul>	<ul style="list-style-type: none"><li>Understand the status of plant kingdom</li><li>Understand the families emphasizing their morphology their technical description of</li></ul>

GOVERNMENT SHIVALIK COLLEGE NAYA NANGAL

DEPARTMENT OF BOTANY

B.Sc (Botany) Part -II (semester IV)

SR. NO	COURSE CODE	PAPER NAME	COURSE OBJECTIVES	COURSE OUTCOME
1	SCIB2418	PLANT ANATOMY	<ul style="list-style-type: none"> <li>The paper contains tissue system, growth and secondary and anomalous secondary growth</li> </ul>	<ul style="list-style-type: none"> <li>They will be understand the internal organization of plants and comes to know about their modifications and their role in different function</li> </ul>
2	SCIB2419	DEVELOPMENT AND REPRODUCTION IN FLOWERING PLANTS	<ul style="list-style-type: none"> <li>The paper contains structure and function of reproductive organs and their significance in plant reproduction. Pollination, Fertilization, Embryogenesis.</li> </ul>	<ul style="list-style-type: none"> <li>Students will able to differentiate</li> <li>Reproductive organs at</li> <li>Morphological, Anatomical level</li> <li>This knowledge will be help to</li> <li>Apply in Agriculture,</li> <li>Floriculture and Horticulture for of hybrids</li> </ul>
3	SCIB2420	Lab	<ul style="list-style-type: none"> <li>Microscopic study of dicot and monocot root,</li> <li>Shoot, leaves from locally available material</li> <li>Study of pollen viability</li> <li>Microscopic study of anomalous secondary growth</li> <li>To study vegetative propagation</li> <li>To study structure of ovule and embryo sac</li> <li>Study of placenta ion, fruit and seed type</li> </ul>	<ul style="list-style-type: none"> <li>They will be understand the internal organization of plants and comes to know about their modifications and their role in different function</li> </ul>

GOVERNMENT SHIVALIK COLLEGE NAYA NANGAL

DEPARTMENT OF BOTANY

B.Sc (Botany) Part -III (Semester V)

Session: 2021-22

SR NO	COURSE CODE	PAPER NAME	COURSE OBJECTIVES	COURSE OUTCOME
1	SCIB3517	PLANT PHYSIOLOGY	<p>Mechanism and physiology life processes in plants.</p> <p>It focuses on the plant nutrient uptake and translocation, photosynthesis, respiration and fat and nitrogen metabolism.</p>	<p>Students will be able to understand the various physiological life processes in plants</p> <p>They will also gain about the various uptake and transport mechanisms in plants and are able to coordinate the various processes.</p> <p>They understand the role of various hormones, signaling compounds, thermodynamics and enzyme kinetics.</p> <p>During the course students will gain knowledge about various mechanisms such as channel or transport proteins involved in nutrient uptake in plants.</p>
2	SCIB3518	PLANT GROWTH, DEVELOPMENT AND BIOTECHNOLOGY	<p>This course would provide students with an understanding of principles and techniques of plant tissue culture, concepts and methods associated with development and analysis and to provide a contextual and inquiry based learning of modern day advances in the field of recombinant DNA technology</p>	<p>Concepts, tools and techniques related to in vitro propagation of plants.</p> <p>Different methods used for genetic transformation of plants, use of Agro bacterium as a vector for plant transformation, components of a</p> <p>Various case studies related to basic and applied research in plant Sciences using transgenic technology.</p> <p>Principles and methods used for phenotypic, genetic and molecular analysis of transgenic plants</p>
3	SCIB3519	Lab	<p>Determine the DPD by using the potato tuber</p> <p>To determine the rate of photosynthesis</p> <p>of phototropism and geotropism and ascent of sap by eosin method</p> <p>Explanation</p> <p>Micro chemical tests of reducing sugars, fats and proteins in plant tissues</p> <p>Demonstration of necessity of light, CO<sub>2</sub> and chlorophyll for photosynthesis Demonstration of the technique of micro propagation</p>	<p>It assist the students in understanding the physiological processes and learn about the biotechnology technique like recombinant DNA</p>

GOVERNMENT SHIVALIK COLLEGE NAYA NANGAL

DEPARTMENT OF BOTANY

B.Sc (Botany) Part -III (Semester VI)

SR.NO	PAPER	PAPER NAME	COURSE OBJECTIVE	COURSE OUTCOME
1	SCIB3617	PLANT ECOLOGY	<p>This course aims to introduce the concepts and principles of ecology, biological diversity, conservation, sustainable development, population, community and ecosystem structure and function, application of these concepts to solve environmental problems.</p> <p>Environmental and conservation strategies with sustainable management.</p>	<p>They will understand the factors leading to Environmental degradation, their reasons and their impact on the Environment.</p> <p>This knowledge can help to form strategies for conservation and sustainable management under the given legislative measures.</p>
2	SCIB3618	PLANT UTILITY	<p>This course aims to introduce the various types of plant products such as fibers, food, medicinal, beverages and narcotics, their cultivation practices and uses</p>	<p>They understand the pattern origin, diversification and cultivation of plants in nature.</p> <p>They are able to design the strategies for conservation of these natural resources</p>
3	SCIB3619	Lab	<p>Plot of quadrats to study of grasslands</p> <p>Estimation of bulk</p> <p>Density, porosity, moisture content and water holding capacity</p> <p>Estimation of pH, temperature, DO in water</p> <p>Study of cotton flower,</p> <p>Section cutting of mustard ground nut,</p> <p>Micro chemical test</p> <p>Field visit to study timber yielding, bamboos, medicinal plants</p>	<p>Understand the pattern of origin, diversification and cultivation of plants in nature</p> <p>Able to design the strategies for conservation of these natural resources</p>

## Government Shivalik College Naya Nangal

### Department of Botany

#### Programme Outcomes of B. Sc

Session : 2021-22

**Social responsibilities:** To a botanist no plant is a weed. Conservation of biodiversity in the era of urbanization and industrialization should be the priority. The courses students will go through during this 3 years undergraduate program will teach students the value of natural wealth and their conservation. Awareness of society about planting trees, their medicinal and industrial values, role of ethno botany, herbal medicines will be top priority.

**Knowledge development:** They will understand the range of plant diversity in terms of morphology, anatomy, phylogeny, classification and their interrelationship. Students will gather knowledge of physiology, cell biology, genetics, plant breeding and micro-propagation, tissue culture and horticulture.

**Intellectual skill development:** Students are able to think logically and organize tasks into a structured form. Assimilate knowledge and ideas based on wide reading in digital platforms.

**Practical skills:** Students learn to carry out practical work, in the field and in the laboratory. An array of techniques & practical skills like identification of algae, fungi, bryophytes, pteridophytes, gymnosperms, plant morphology and anatomy, angiosperm taxonomy, vegetation analysis techniques, micro chemical analyses of plant materials, physiology, cytology and genetics will be learnt.

**Environment and sustainable development:** Understand the impact of the plant diversity in societal and environmental contexts, and demonstrate the knowledge and requirement of sustainable development.

**Project management:** field work project will prepare students how to plan and execute a project either individually or as a team. These experiences will be invaluable in the long run.

**Use of instruments:** Create, select, and apply appropriate techniques, resources and modern instruments and equipment for Biochemical estimation, cellular and physiological activities of plants with an understanding of the application and limitations.

**Ability to use digital platform:** Use of different software enriches their communication skill and makes them friendly to digital platforms like Microsoft, Adobe acrobat, Adobe Photoshop, Google etc.

**Ethics:** Being students of natural science ethics is the key to protect our mother nature. The principles of conservation need to be followed while collecting specimens or doing field work. Manipulation of laboratory data and protocols are strictly prohibited and thus building ethics among students is a must.