



# BON SECOURS COLLEGE FOR WOMEN

Nationally Accredited with 'A' Grade by NAAC  
UGC Recognized 2(f) and 12(B) Institution  
VILAR BYPASS, THANJAVUR - 613 006

## DEPARTMENT OF BOTANY

### **PROGRAMME OUTCOMES:**

**PO1.Critical Thinking:** Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.

**PO2.Effective Communication:** Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.

**PO3.Social Interaction:** Elicit views of others, mediate disagreements and help reach conclusions in group settings.

**PO4. Effective Citizenship** Obtain quality education in the basic areas of Botany

**PO5. Ethics:** Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.

**PO6. Environment and Sustainability:** Understand the issues of environmental contexts and sustainable development

**PO7. Self-directed and Life-long Learning:** Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological changes.

### **PROGRAMME SPECIFIC OUTCOMES**

**PSO1:** Understand the nature and basic concepts of cell biology, Biochemistry, Taxonomy and Ecology

**PSO2:** Analyse the relationship among plants, animals and microbes

**PSO3:** Perform procedures as per laboratory standards in the areas of Biochemistry, Taxonomy, Plant physiology, Bioinformatics, Economic Botany and Plant Ecology

**PSO4:** Understand the applications of biological sciences in Horticulture, Mushroom cultivation, Agriculture and medicine

### **COURSE OUTCOME**

#### **COURSE I: (Bacteria, Viruses, Algae, Fungi and Lichens) COURSE CODE: 16SCCB01**

1. Acquired knowledge about microbial diversity -KL<sub>1</sub>
2. Classify the nutritional types of bacteria -KL<sub>2</sub>
3. Discuss the techniques in plant viruses - KL<sub>2</sub>
4. Explain the structure, reproduction and life cycles of various algae -KL<sub>2</sub>
5. Explain the structure, nutrition and reproduction of bacteria and viruses - KL<sub>3</sub>
6. Discuss the cultivation and identification methods of fungi KL<sub>2</sub>
7. List the salient features of the main classes of fungi. -KL<sub>2</sub>
8. Recognize the types of lichens -KL<sub>1</sub>

**COURSE II: (Plant pathology and Plant protection) COURSE CODE: 16SCCB02**

1. Analyzing plant diseases with special reference to the causative agents, symptoms, etiology and control measures – KL<sub>3</sub>
2. List the plant diseases in crops and their management – KL<sub>1</sub>
3. Explain about conservation of biodiversity, Non-conventional energy and pollution –KL<sub>2</sub>
4. Justify the contributions of plant pathologist and usage of various techniques – KL<sub>6</sub>
5. Classifies plant diseases based on causal agents and general symptoms – KL<sub>4</sub>
6. Develop the employability skills by learning the structure, reproduction and applied aspects of microbes – KL<sub>3</sub>
7. Categorize the methods of plant protection – KL<sub>3</sub>

**COURSE I & II: PRACTICAL –I**

**COURSE CODE: 16SCCB01**

1. Capable to become practical knowledge about micro-preparation and observation of permanent slides of genera – KL<sub>3</sub>
2. Identify important algal forms by their morphological and anatomical features – KL<sub>1</sub>
3. Observation of crop plants infected by the pathogen included in the syllabus and study of symptoms, causative agents, and etiology- KL<sub>3</sub>
4. Hands on training for micro preparation of identify the diseases mentioned theory- KL<sub>3</sub>

**COURSE: ALLIED ZOOLOGY-I(Biology of Invertebrates and Chordates)**

**COURSE CODE: 16SACZ01**

1. Understand the diversity and classification and functional aspects of different systems of Protozoa, Porifera, Coelenterata and Platyhelminthes –KL<sub>1</sub>
2. Discuss about the Invertebrate classification, lifecycles and mode of reproduction in members of fauna –KL<sub>2</sub>
3. Empower the practical skills to comprehend the Physiology and other functions of each and every vital system –KL<sub>3</sub>
4. Equip our students with good quality appear for competitive examinations –KL<sub>3</sub>
5. Identified the taxonomic status of the entire chordates and discussed the evolutionary model of the group –KL<sub>1</sub>
6. Analyse the ecology of some important fishes, amphibians reptiles, birds and mammals –KL<sub>4</sub>
7. Impart knowledge in comparative anatomy and development system of Chordates –KL<sub>1</sub>

**COURSE: ALLIED ZOOLOGY-II(Commercial Zoology) COURSE CODE: 16SACZ02**

1. Develop basic knowledge about Entrepreneurship –KL<sub>1</sub>
2. Analyzing Taxonomy, Morphological sex differences in larva and adult –KL<sub>2</sub>
3. Understand the culture of mulberry plants –KL<sub>2</sub>
4. Discuss about the culture methods of *B.mori* and mulberry silk –KL<sub>2</sub>
5. Manipulate the quality of silk, silk gland and improve marketing strategies of silk –KL<sub>3</sub>
6. Plan monitor and maintain apiculture as hobby or as an additional income –KL<sub>6</sub>
7. Understand and identify different honey bee species, bee products –KL<sub>2</sub>
8. Outline the habit and habitat of earthworm, reproduction and explain vermicomposting methods –KL<sub>1</sub>
9. Demonstrate the vermicomposting production, harvesting and packaging –KL<sub>3</sub>

**COURSE: ALLIED ZOOLOGY-I PRACTICAL****COURSE CODE: 16SACZO1P**

1. Attained knowledge on the observation of preserved specimens and instruments of sericulture –KL<sub>1</sub>
2. Gain knowledge scientific classification of Earthworm, external morphology, reproduction –KL<sub>1</sub>
3. Establishment of Vermicomposting (Pit & Bed methods) and Vermiwash units –KL<sub>3</sub>
4. Create aware of commercially important animals –KL<sub>4</sub>
5. Observation and identification of permanent slides, demonstration of digestive & nervous system –KL<sub>1</sub>

**COURSE – III(Bryophytes, Pteridophytes, Gymnosperms and Paleobotany)****COURSE CODE: 16SCCB03**

1. Understand the diversity and economic values of this group of plant community-KL<sub>2</sub>
2. Recall and relate the general characters of algae and fungi –KL<sub>1</sub>
3. Explain the classification, structure and reproduction of the main classes of bryophytes –KL<sub>2</sub>
4. Illustrate the life cycle patterns of bryophyte and pteridophytes –KL<sub>2</sub>
5. Explain the stealer evolution in Pteridophytes, Heterospory and origin of seed habit –KL<sub>2</sub>
6. Classify the pteridophytes by their characteristic features –KL<sub>2</sub>
7. Illustrate about the structure, lifecycle of fossil plants & list the methods of fossilization-KL<sub>2</sub>
8. Summarise the scope of Paleobotany, types of fossils and geological time scale –KL<sub>2</sub>
9. List few representatives of fossils forms - KL<sub>1</sub>

**COURSE-IV(Anatomy and Embryology)****COURSE CODE: 16SCCB04**

1. Analyse various plant cells tissue systems and their functions -KL<sub>4</sub>
2. Outline the internal structure of dicot plants –KL<sub>2</sub>
3. Understand the normal and anomalous secondary growth in plants and their causes –KL<sub>2</sub>
4. Compare microsporogenesis and megasporogenesis –KL<sub>2</sub>
5. Illustrate the structure of anther –KL<sub>2</sub>
6. Be enlightened about the mechanism of pollination and basic structure of the embryo-KL<sub>2</sub>
7. Explain the double fertilization and their significance –KL<sub>2</sub>
8. Illustrate about the structure and development of dicot and monocot embryos –KL<sub>2</sub>
9. Describe the embryosac, endosperm and embryo –KL<sub>2</sub>

**COURSE- PRACTICAL – II (Bryophytes, Pteridophytes, Gymnosperms &Paleobotany, Anatomy and Embryology)****COURSE CODE: 16SCCB02P**

1. Microscopic observation & identification of Bryophytes, Pteridophytes, Gymnosperms and Paleobotany –KL<sub>1</sub>
2. Dissect out mount dicot embryo ( Tridax ) –KL<sub>4</sub>
3. Observe and identify the morphological structure of bryophytes –KL<sub>1</sub>
4. Identify the permanent slides of bryophytes –KL<sub>1</sub>
5. Develop the practical skills by observing the morphological, anatomical and reproductive structures of plant diversity –KL<sub>3</sub>

6. Micropreparation of stems, roots and leaf of dicot(Tridax), monocot(Canna) –KL<sub>3</sub>

#### **COURSE – V(Cell and Molecular Biology)**

**COURSE CODE: 16SCCB05**

1. Acquired knowledge about “Cell Science” –KL<sub>1</sub>
2. Explain the structure of Cell components and their functions –KL<sub>2</sub>
3. Discuss the function of genes, process of inheritance –KL<sub>2</sub>
4. Illustrate the structure, chemistry and functions of DNA and RNA -KL
5. Understand the chromosomes, special types and cell divisions –KL<sub>2</sub>
6. Compare the difference between prokaryotic and eukaryotic cells –KL<sub>2</sub>

#### **COURSE – VI (Genetics, Biostatistics and Evolution) COURSE CODE: 16SCCB06**

1. Explain the laws of Mendel in classical genetics and deviations from Mendelian ratios –KL<sub>2</sub>
2. Describe the complementary factor, epistasis and duplicate factor –KL<sub>2</sub>
3. Analyse the basic principles of geology –KL<sub>4</sub>
4. Summarise the role that biodiversity plays in conservation science –KL<sub>2</sub>
5. Impart knowledge on biostatistics and its applications in biological experiments.
6. Calculate the various statistical methods of analysis –KL<sub>3</sub>
7. Familiarize with the various concepts of evolution –KL<sub>2</sub>

#### **COURSE – VII(Morphology, Taxonomy and Economic Botany) COURSE CODE: 16SCCB07**

1. Understand the morphological features of vegetative, inflorescence, fruits and seeds characters –KL<sub>2</sub>
2. Compare the major groups of vascular plants and their phylogenetic relationships –KL<sub>2</sub>
3. List Botanical Survey of India KL<sub>1</sub>
4. Gain proficiency in the use of keys and identification manuals for identifying any unknown plants to species –KL<sub>1</sub>
5. Briefly studied on herbarium techniques -KL<sub>1</sub>
6. Investigate the taxonomic evidences from molecular, numerical and chemicals –KL<sub>4</sub>
7. Impart knowledge on the economically important with their systematic treatment –KL<sub>2</sub>
8. Differentiate the conceptual development of ‘Taxonomy’ and ‘Systematic’ –KL<sub>4</sub>
9. Trace the history of classification and acquire knowledge on the physiological functions of plants –KL<sub>1</sub>

#### **COURSE: PRACTICAL – III(Cell and molecular biology & Genetics, Biostatistics and Evolution & Morphology, Taxonomy of Angiosperms and Economic Botany) COURSE CODE: 16SCCB03P**

1. Dissect out the floral parts of plants coming under the families prescribed in the theory syllabus –KL<sub>3</sub>
2. Field study to a floristic rich area to observe and collect the plants in their natural habitats –KL<sub>6</sub>
3. Identify the economic products related to theory syllabus and write Botanical name, family and uses –KL<sub>1</sub>
4. Observe the genetic variations among inter and intra specific plants –KL<sub>1</sub>
5. Demonstration of emasculation experiment –KL<sub>2</sub>
6. Measured the given sample and calculate mean, median, mode and standard deviation, diagrammatic representation (Histogram) –KL<sub>3</sub>

7. Training students to prepare micro preparation and showing the stages of mitosis (onion root tips) and showing permanent slides/photographs of mitosis & meiosis –KL<sub>3</sub>
8. Determination of problems on simple monohybrid and dihybrid ratios, interaction on factors included in the theory –KL<sub>3</sub>

### **COURSE-VIII: (Plant Physiology, Biochemistry and Biophysics)**

#### **COURSE CODE: 16SCCB08**

1. List the requirement of mineral nutrient of plant growth. –KL<sub>1</sub>
2. Identify a sensory photobiology through the mechanism of photosynthesis –KL<sub>1</sub>
3. Gain knowledge about the Plant Growth Hormones mentioned in theory –KL<sub>6</sub>
4. Understand the biosynthesis of terpenes, phenols and nitrogenous compounds and the concepts in biophysics –KL<sub>2</sub>
5. Discuss the properties, enzyme catalysis and activation energy-mechanism of enzyme action –KL<sub>2</sub>
6. Gain skill on working principles of pH meter, colorimeter and centrifuge –KL<sub>3</sub>
7. Recognise the technique of Electrophoresis & Chromatography –KL<sub>6</sub>

### **COURSE- IX: (Plant Ecology and Conservation)**

#### **COURSE CODE: 16SCCB09**

1. Define the approaches to the study of Ecology, population and community ecology –KL<sub>1</sub>
2. Explain about the principles of toxicology and biological monitoring –KL<sub>2</sub>
3. Classify the different types of pollutions, consequences in the environment and its mitigation –KL<sub>4</sub>
4. Acquire knowledge regarding vegetation and its analysis –KL<sub>1</sub>

### **COURSE: PRACTICAL-IV(Plant physiology, Biochemistry and Biophysics & Plant ecology and Conservation)**

#### **COURSE CODE: 16SCCB04P**

1. Analyse ecological field study - Quadrats and Line transect methods of vegetation study –KL<sub>4</sub>
2. Determination of Osmotic Pressure – Plasmolytic method –KL<sub>3</sub>
3. Apply the extraction and separation of Photosynthetic Pigments by Chromatography techniques –KL<sub>3</sub>
4. Determination of rate of photosynthesis - Hydrilla experiment of Willmont's Bubbler using different colour filters –KL<sub>3</sub>
5. To Demonstrate the working principles of pH meter, Centrifuge and Colorimeter –KL<sub>4</sub>

### **MAJOR-BASED ELECTIVE-I(Medical and Applied Botany) COURSE CODE: 16SMBEB01**

1. Discuss about history and relevance of herbal drugs in Indian system of medicine-KL<sub>1</sub>
2. Improve the uses of plants as medicine by traditional indigenous approaches-KL<sub>2</sub>
3. Explain how current medicinal practices are often based on indigenous plant knowledge and different perspective on treating ailments-KL<sub>2</sub>
4. Analyse the macroscopic and microscopic characters, chemical constituents, adulterations, therapeutical and pharmaceutical uses of medicinal plants-KL<sub>4</sub>
5. Explain the techniques for drug evaluation and medicinal gardening- (cultivation practices, marketing)-KL<sub>2</sub>
6. Understand the basic information on mushroom KL<sub>2</sub>

7. To Acquire sufficient academic and practical experiences and become self-employed in the mushroom and nursery ventures KL6
8. Empowered with entrepreneurial skills through the production and disease management of mushrooms KL4
9. Acquired knowledge regarding biofertilizers and its consequences in the environment KL1
10. Explain about the benefits of organic farming and its relation to waste management's KL3
11. Develop skill on BGA bio fertilizer production of bacterial biofertilizers and get awareness to mitigate the usage of synthetic fertilizer KL2

### **MAJOR –BASED ELECTIVE – II(Plant Breeding, Horticulture and Landscaping)**

#### **COURSE CODE: 16SMBEO2**

1. To understand the concept of plant propagation methods KL2
2. Gain new knowledge about mutation breeding and seed certification KL3
3. Understand the modern strategies applied in plant breeding for crop improvement KL2
4. Outline the role plants in human welfare, and list importance of plants & plant products economic use KL4
5. Impart knowledge of landscape architecture design practices and processes in order to establish the indoor gardening KL2
6. Schedule a landscape or interiorscape maintenance program and employability skills in the field of gardening KL6
7. Acquire knowledge on components of Greenhouse technology KL2

### **MAJOR-BASED ELECTIVE – III(Plant Biotechnology and Bioinformatics)**

#### **COURSE CODE: 16SMBEO3**

1. Investigate aspects of *in vitro* culture techniques used genetic engineering of transgenic plants –KL4
2. Discuss the scope of plant tissue culture technology, plant biosynthetic pathways for the production of primary and secondary metabolites, therapeutic proteins in plants –KL2
3. Understand the principle and basic protocols for Plant Tissue Culture –KL2
4. Explain the morphogenesis and organogenesis in plants –KL2
5. Improve the method of large scale production of bio fertilizer & Organic farming –KL3
6. Summarise the basic concepts of Bioinformatics and significance on Biological data analysis –KL2
7. Discriminate the phylogenetic analysis-molecular evolution –KL6
8. Formulate the Bioinformatics in Drug designing –KL3
9. Analyse the various statistical methods of analysis –KL4
10. Classify different types of Biological Databases –KL4
11. Exposed to computational methods, tools and determination of Biological macromolecules- DNA, Protein and Carbohydrates –KL3
12. Overview about pathway and enzyme database, Sequence submission tools –KL2
13. Identify the angiosperms by applying keys obtain technical skills for start-up programme –KL1

#### **COURSE: GENDER STUDIES**

#### **COURSE CODE: UGGS**

1. Acquired knowledge about concepts of gender and gender equity –KL1
2. Identify and improve the plans on women studies and gender issues –KL1

3. Recognize the initiatives and policies of women development and gender empowerment –KL6
4. Dissemination of acts and amendments on Women's movements and safe guarding mechanism –KL6
5. Solve the gender discrimination problems in society –KL3

**COURSE: ENVIRONMENTAL STUDIES**

**COURSE CODE: 16UGCES**

1. Acquired knowledge on the importance and multidisciplinary nature of Environmental studies -KL1
2. Summarise the sources, effects and control measures of various types of Pollutants –KL2
3. Explain the conservation of biodiversity and national and international initiatives and organisations –KL4
4. Develop the employability skills by understanding the basic and fundamental concept of various branches in environmental science –KL3

**COURSE: SOFTSKILL DEVELOPMENT**

**COURSE CODE: RUGSDC**

1. Improve attitudes and personal relations and leadership –KL3
2. Analyse communication skills and modify by practise in continue process –KL4
3. Build up confidence and solve the problem in competitive world –KL6

**COURSE: VALUE EDUCATION**

**COURSE CODE: RUGVED**

1. Justify philosophy of life and values of society – KL6
2. Aware of human rights and this organization – KL6
3. Summarise the right of Information Act,2005 and Consumer protection Act,1986 – KL2
4. Discuss the yoga and health management – KL2
5. Recognize the Tamil nadu Public Service Commission – KL2
6. List out competitive examinations – KL1