

Department of Botany

The Department of Botany, Union Christian College with its rich scientific, philosophical and spiritual heritage is on the path of spreading the knowledge to the public through the students and faculty in a wider sense of service to fulfill the founder's vision when it reaches its centenary year. The Department of Botany wishes to implement following major programs during the Centenary year to our UG and PG students along with students from high school, higher secondary School and College teachers as well as to school students and research scholars.

The Botany Department Proposes the following projects.

1. Add on Course- Certificate/Diploma/Advanced Diploma Courses

Certificate/Diploma/Advanced Diploma Course in Floriculture and Nursery management. The department had a Certificate/Diploma/Advanced Diploma course in Industrial Floriculture from 2009 to 14 funded by UGC, The course was given to BSc Botany students along with their degree course. The course was taken during Saturdays and holidays.

2. Centre for Ornamentals and Fruit tree Regeneration and Distribution:

Through a detailed survey it was found that there is a growing demand for ornamentals and fruit tree saplings for the on-campus planting, local community and partner institutes. the present project aims to incorporate techniques such as micropropagation, root-trainer technology and hormone technology for artificial regeneration. A major initiative of this project is to regenerate the indigenous tree species such as *Morinda citrifolia* (Noni), *Syzygium cumini* (Njaval), *Syzygium jambos* (Rose apple), *Bunchosia glandulifera* (peanut butter fruit), *Garcinia gummi-gutta* (Camboge), *Phyllanthus emblica* (Gooseberry) and to distribute among land owners. farmers, student naturalists for planting in homesteads. It will also work to develop a pilot plantation of the species in the herbal garden of Union Christian College under the supervision of Department of Botany. In addition to the identified fruit trees for regeneration a list of over 200 varieties of ornamental plants which fall under Dracaena (25 + varieties), Croton (25 + varieties), Ixora (5 + varieties), Tabernaemontana (5 + varieties), Spiral gingers (5 + varieties), Pandanus (5 + varieties). Lilly (10 + varieties), Water lily (5 + varieties), Crassulaceans (10 + varieties) and over 100+ assorted flowering plants will be readily available for distribution.

3. Centre for Medicinal and Aromatic plant regeneration and Distribution:

Through technology transfer the farmers and the interested students can involve in wide scale propagation of the indigenous medicinal and aromatic plants species that falls under Rare, Endangered, Threatened or Indigenous Medicinal category. Seedlings and propagules developed will be open for distribution to public by the end of the project. A collection of over 1000 plants are readily available in the TCJ memorial botanical garden, which include *Dalbergia latifolia* (rosewood), *Vateria indica* (Kunthirikka Payin), *Gmelina arborea* (Kumbil), *Terminalia bellerica* (Thanni), *Saraca asoca* (Asokam), Mahogany, Lakshmitharu. The faculty in the Department of Botany will serve as 'Monitors' for the smooth conduct of the program. The group members will be observe the progress of the project at different level.

4. Biodiversity Enrichment through Prof. OM Mathen Arboretum and Prof. TCJ Botanical Garden

Medicinal plants will be planted in botanical garden with the help of students as an ongoing process. Students are made aware about botanical name, family and medicinal importance of plant. It is very useful to students for creativity innovation and improving gardening and horticulture skills. A rare collection of tree species and lianas are available in the Prof. O.M Mathen Arboretum with over 100+ species. During the project period more species from the indigenous forests will be added to the existing collection. Poly house, Green house and the several seed beds in the Prof. T.C.J. Botanical garden will be strengthened and it will be active round the year in order to produce and distribute plants as per requirement.

5. Plant Clinic – To identify the plant diseases and providing the remedial measures to local community and farmers.

The Plant Health Clinic is to offer free consultancy to farmers and needy people about plant disease diagnosis and integrated disease management practices and on general crop care. The farmers are not only advised on remedial measures for management of diseases but are also provided with scientific information. Students observe and study morphological effects on crop due to disease, symptoms of diseases, different causal organisms of diseases such as bacteria, viruses, fungi, nematode etc. Various measures to control the disease and preventive measures are also studied by students guided by teachers. They understand different aspects of plant pathology in practical way. Due to this clinic students realize their responsibility towards society.

6. Training program on use and preparation of organic manures

For the consciousness of local farmers training programme and workshop will be arranged about sustainable agriculture and organic farming. In this programme knowledge will be given to farmers about hazardous effects of overdose of chemical fertilizers and importance of organic manures. Training will be given to farmers about different aspects of sustainable agriculture as methods of preparation of compost, vermicompost, green manure, and other manures, bio-pesticides, integrated pest management, nutrient management etc.

7. Social awareness program about conservation of sacred groves

The importance of grove is taught to students of Botany. Then the sacred groves commonly called devrai are visited as study tour due its rich biodiversity. The knowledge about different plant species, their uses and environmental role is given to students. Later with the help of students of Botany, common people in locality are made aware about importance of sacred groves. This programme is useful for use of knowledge from books to society and result into protection of sacred groves. The objective of this program is to interact with local people and different organizations to learn more about sacred groves of the country and to strengthen the diverse sacred groves related local management practices and knowledge systems.

8. Hand on training for High School and Plus 2 Biology Teachers in Basic Laboratory Procedures.

The curriculum of high school and higher secondary Biology has been updated recently with many more new additions from modern biology such as Biotechnology, Bioinformatics, Genomics etc. at preliminary levels. The department will organize hands on training and advanced lecture classes for teachers at high school and higher secondary level for a week, twice per year, as per the selection from common applications invited. They will be given mini projects which suits to their requirements in class room. The following hands on sessions will be conducted for seven days:

1. DNA isolation, Agarose gel electrophoresis and visualization of DNA bands using UV transilluminator, PCR (2 days)
2. Bacterial isolation, culture and gram staining(2 days)
3. Introducing Bioinformatics –Biological database search (1 day)
4. Demonstration of plant physiology experiments(1 day)
5. Project preparation for Science Exhibitions(1 day)

Selection: Based on first come first serve and district wise. A total of 15 teachers per batch and a total of 4 batches will be recruited for the program.

9. Orientation and training for plus 2 students

Three day training program for plus two students to impart a career orientation and job opportunities in biological sciences with special reference to Botany

Day 1: Introducing biology at a higher level and career talk

Day 2: Basic laboratory practices- Microscopy, Staining, Mounting and observation, permanent slides

Day 3: Modern Biology-Demonstration of DNA isolation, Electrophoresis, PCR

Selection: Those students with high academic profile and keen interest in biology will be selected, only two students from each school and a total of 50 per batch with two batches per year.

10. Orientation to College Teachers

This program aims to inculcate the modern trends in plant science research to college teachers and researchers. Two programs are envisaged for college teachers and one programme on Research methodology for researchers in biology

1. Five days orientation programme on Molecular biology –PCR and allied techniques
2. Ten days workshop on Biotechnology –new concepts will be organized and selection will be done on all Kerala basis- Microbial biotechnology, Genetic transformation- Agrobacterium mediated, Bionanotechnology, metagenome analysis, transcriptome analysis and Crispr technology-fundamentals and practice.

Selection: One teacher from each college per batch with a total of 20 participants per batch and two batches per year.

11. Workshop on Research methodology for researchers

One week workshop on Research methodology for researchers in biology at state level-How to write a synopsis for research?, Orientation for conducting original research. Statistical tools in biological research, Thesis writing, Research paper , Research proposal, Plagiarism tools, Ethics in research.

Selection: All short listed candidates will be selected. 25 participants in each batch with at least 5 batches per year.