

Session 2020-21

# Programme and Course Outcome

**B.Sc Medical**



***Multani Mal Modi College,  
Patiala***

## **Program Outcomes (POs)**

After completing this graduate degree program, students should be able to

**PO-1: Core competency:**

Students will be able to identify various types of plants of economic interest and wild animals in different vegetation rich zones. They will be quite familiar with various methods to protect and conserve the biodiversity and would be competent enough to spread awareness among people to save the environment. In the present scenario, they could devise the way to minimize the use of various chemicals in agriculture fields and replace it with alternate environment friendly biofertilizers and biopesticides.

**PO-2: Analytical ability:**

The students will be able to demonstrate the knowledge of various scientific methods like data collection, formation of hypothesis and critically analyzing the problem before suggesting the ways to answer the questions in their area of specialization like pathology, genetics, biodiversity, physiology, and ecology.

**PO-3: Digitally equipped:**

After graduation, students will acquire digital skill and will be capable to integrate the fundamental concept with modern tools.

**PO-4: Ethical values:**

Students will develop scientific temper, logical thinking and learn team workmanship which will help them in higher educational institutions, industries, and society.

**PO-5: Professional scope:**

After graduating, B.Sc. Medical students will have a lot of opportunities in higher studies in the field of Botany, Zoology, Chemistry, Biotechnology, Microbiology, Genetics, and Forestry etc. if they opt for teaching and research as a goal of their career. They will be eligible for various competitive exams like civil services and other public undertakings.

**Programme & Course Outcomes of B.Sc Medical (Session 2020-21)**

**Course Outcomes (COs)**

<b>CLASS</b>	<b>SEMESTER</b>	<b>PAPER</b>
<b>B.Sc. I (Medical)</b>	<b>I</b>	Paper I: Diversity of Microbes
		Paper II : Diversity of Cryptogams
	<b>II</b>	Paper III: Cell Biology
		Paper IV : Genetics & Evolution
<b>B.Sc. II (Medical)</b>	<b>III</b>	Paper V : Diversity and Systematics of Gymnosperms
		Paper VI : Diversity and Systematics of Angiosperms
	<b>IV</b>	Paper VII: Plant Anatomy
		Paper VIII: Development & Reproduction in Flowering Plants
<b>B.Sc. III (Medical)</b>	<b>V</b>	Paper IX : Plant Physiology
		Paper X: Plant Growth, Development and Biotechnology
	<b>VI</b>	Paper XI : Plant Ecology
		Paper XII : Plant Utilization

## **COURSE OUTCOMES (COs)**

### **CLASS: B.SC. MEDICAL-I SEMESTER-I**

#### **Course Outcomes: Botany Paper-I: Diversity of Microbes**

After completing this course, the student will be able to:

CO-1: Understand the basic concepts related to Viruses, Bacteria, Fungi and Lichens

CO-2: Know about Mycoplasma

CO-3: Understand useful and harmful activities of Viruses and Bacteria

CO-4: Examine the morphology and life history of various Fungi

CO-5: Know economic importance of Fungi and Lichens

#### **Courses Outcomes: Botany Paper-II: Diversity of Cryptogams**

After completing this course, the student will be able to:

CO-1: Know the systematic, morphology and structure of algae

CO-2: Understand the life cycle patterns of various algae

CO-3: Understand useful and harmful activities of algae

CO-4: Learn about structure, reproduction and affinities of various Bryophytes

CO-5: Know the characteristics, structure and reproduction of Pteridophytes

CO-6: Understand evolution of Bryophytes and Pteridophytes

**CLASS: B.SC. MEDICAL- I SEMESTER-II**

**Courses Outcomes: Botany Paper-III: Cell Biology**

After completing this course, the student will be able to:

CO-1: Understand the general structure of Cell

CO-2: Know structure and function of Nucleus

CO-3: Understand structure and function of various cell organelles

CO-4: Learn function of Mitochondrial and Plastid DNA

CO-5: Know about chromosome morphology and comprehend the effect of chromosomal abnormalities in numerical and structural changes leading to genetic disorders

CO-6: Develop understanding of Structure and organization of cell wall and plasma membrane

**Courses Outcomes: Botany Paper-IV: Genetics and Evolution**

After completing this course, the student will be able to:

CO-1: Examine the structure, function and replication of DNA

CO-2: Know brief account of Genetic Code

CO-3: Understand mitotic and meiotic cell division

CO-4: Learn conceptual understanding of laws of Inheritance and linkage analysis

CO-5: Understand allelic and non-allelic interactions

CO-6: Understand transcription, translation and regulation of gene expression in prokaryotes and eukaryotes

CO-7: Analyze the phenomena of mutations and transposable genetic elements

CO-8: Learn various theories of Evolution and evidences of Organic evolution

**CLASS: B.SC. MEDICAL-II SEMESTER-III**

**Course Outcomes: Botany Paper V: Diversity and Systematics of Gymnosperms**

After completing this course, the students will be able to

- CO-1: Identify and classify various gymnosperms on the basis of their characteristic features.
- CO-2: Explain the process of fossilization & describe fossils of gymnosperms.
- CO-3: Construct data on distribution, cytology and diversity of gymnosperms.
- CO-4: Compare & analyze different gymnosperms according to their resemblances and differences.
- CO-5: Understand the concept of evolution & able to analyze origin & evolution of seed habit in gymnosperms.
- CO-6: Develop critical understanding on morphology, anatomy, reproduction and alternation of generations in gymnosperms.
- CO-7: Analyse genera with their ecological and economic importance.
- CO-8: Apply experimental techniques & methods of appropriate analysis of gymnosperms.

**Course Outcomes: Botany Paper VI: Diversity and Systematics of Angiosperms**

After completing this course, the students will be able to

- CO-1: List primitive and advanced characters of Angiosperms.
- CO-2: Assess terms and concepts related to phylogenetic systematic of Angiosperms.
- CO-3: Comprehend the basic concepts of plant taxonomy & botanical nomenclature.
- CO-4: Interpret the rules of ICBN in Botanical nomenclature.
- CO-5: Generalize the characters of the families according to the Bentham & Hooker's system of Classification.
- CO-6: Enumerate and create an inventory on economic importance of locally available Angiosperms.
- CO-7: Name and describe common plants to prepare field report on some of locally available Angiosperms.
- CO-8: Apply experimental technique to diagnose and describe technically, the floral details of some Angiosperms.

**CLASS: B.SC. MEDICAL-II SEMESTER-IV**

**Course Outcomes: Botany Paper VII: Plant Anatomy**

After completing this course, the students will be able to

- CO-1: Understand the fundamental concepts of Plant anatomy.
- CO-2: Analyse and recognize different organs of plant and secondary growth.
- CO-3: Develop critical understanding on root and shoot apical meristem organizations.
- CO-4: Apply cytological technique for appropriate anatomical analysis of root, stem and leaf.
- CO-5: Explain structure and functions of different tissue and tissue systems.

**Course Outcomes: Botany Paper VIII: Development and Reproduction in Flowering Plants**

After completing this course, the students will be able to

- CO-1: Understand the structure and function of flower.
- CO-2: Demonstrate various methods of reproduction applicable in flowering plants.
- CO-3: Apply various methods of vegetative propagation in floriculture and horticulture.
- CO-4: Identify and classify various types of inflorescences and fruits.
- CO-5: Evaluate the structure organization of flower and process of pollination and fertilization.
- CO-6: Understand and solve the self-incompatibility in pollination and pollen-pistil interaction.
- CO-7: Evaluate special structure of ovule, embryo, endosperm and fruit.
- CO-8: Explain development stages of male and female gametophytes, endosperm, embryo, seed and fruit.
- CO-9: Explain the mechanisms of pollination and dispersal of seeds and fruits.

**CLASS: B.SC. MEDICAL-III SEMESTER-V**

**Course Outcomes: Botany Paper IX: Plant Physiology**

### ***Programme & Course Outcomes of B.Sc Medical (Session 2020-21)***

On completion of this course, the students will be able to

- CO-1: Understand important water relation of plants with respect to various physiological processes.
- CO-2: Understand the role of macro- and micronutrients, their mode of availability to the plants, deficiency and toxicity symptoms.
- CO-3: Classify aerobic and anaerobic respiration.
- CO-4: Explain the significance of Photosynthesis and Respiration.
- CO-5: Recognize the importance of Carbon assimilation in Photorespiration.
- CO-6: Understand the structure and properties of various enzymes.
- CO-7: Generalize the concepts of transport of water, minerals, and organic substances.
- CO-8: Interpret the biology of Nitrogen fixation.
- CO-9: Evaluate the process of ATP synthesis, nitrogen metabolism and lipid metabolism.
- CO-10: Conceptualize the permeability of plasma membrane by studying the effect of temperature and organic solvents.

### **Course Outcomes: Botany Paper X: Plant Growth, Development and Biotechnology**

On completion of this course, the students will be able to;

- CO-1: Know about the basic principles of plant growth and development, metabolism.
- CO-2: Understand the concepts and applications of photoperiodism and vernalization.
- CO-3: Familiarize the basic understanding of physiology of seed dormancy and germination.
- CO-4: Understand the fundamentals and core concepts of plant biotechnology and genetic engineering.
- CO-5: Develop conceptual understanding of plant genetic resources, plant breeding and non conventional methods of crop improvement.
- CO-6: Familiarize with the tools and techniques of gene mapping, chromosome walking, genomic and cDNA library.
- CO-7: Develop their competencies on different types of plant tissue culture.
- CO-8: Learn about the different methods and applications of transgenic technology.

### **CLASS: B.SC. MEDICAL-III SEMESTER-VI**



**Course Outcomes: Botany Paper XI: Plant Ecology**

On completion of this course, the students will be able to

- CO-1: Learn the various approaches of Ecology (Autecology, Synecology and Genecology)
- CO-2: Understand the concept of population & Community Ecology.
- CO-3: Analyse the concepts of plant communities and ecological adaptations in plants.
- CO-4: Learn about the concept of biodiversity conservation, various kind of pollution, their effects and mitigation measures.
- CO-5: Understand the concepts of global warming and climate change.

**Course Outcomes: Botany Paper XII: Plant Utilization**

On completion of this course, the students will be able to

- CO-1: Identity and classify the basic medicinal plants.
- CO-2: Apply techniques of conservation and propagation of medicinal plants.
- CO-3: Setup the process of harvesting, drying and storage of important spices and medicinal herbs.
- CO-4: Conceptualize the Cultivation, harvesting and economic benefits of fruit, vegetable, oil and fibre yielding crops.
- CO-5: Learn the processes involved in Cultivation and harvesting of important beverages and narcotics.
- CO-6: Setup the processes involved in cultivation and understanding of important recommended varieties of food crops.
- CO-7: Learn the steps involved in cultivation and processing of Pararubber.