Program: BSc Botany

Class: FYBSc and SYBSc

Program Outcomes

Program Specific Outcomes

Course Outcomes

SIES College of Arts Science and Commerce, (Autonomous), Sion (West)

Department of Botany

POs, PSOs and COs for the three years Integrated B.Sc. Program

B.Sc. Botany
Program Outcomes and Program Specific Outcomes

Upon completion of this under-graduate degree program, a student will be able to accomplish the following program outcomes.

NO.	Details
PO1.	**Complex Problem Solving:** Applying the knowledge of various courses learned under a program with an ability to break down complex problems into simple components, by designing processes required for problem solving. *(Analyze, Apply, Evaluate)*
PO2.	**Critical Thinking:** Organizing thoughts to identify assumptions, verifying the accuracy and validity of assumptions, making informed decisions that guide actions (at Institutional, Personal and Intellectual level), developing the ability to think with different perspectives and ideas. *(Analyze, Apply, Evaluate, Create, Differentiate, Compare, Classify)*
PO3.	**Reasoning ability and Rational thinking:** Developing rational thinking on the basis of acquired contextual knowledge, assessing societal, public health and safety, cultural, legal, gender, ethnic and environmental issues, and performing with decisive responsibility. *(Analyze, Apply)*
PO4.	**Research Aptitude:** Utilizing the contextual knowledge in an interdisciplinary framework. Integrating research-based knowledge and research methods involving problem definition, analysis and interpretation of data, synthesis of the information to provide valid conclusions. *(Working on surveys, projects, assignments, solving new problems in practicals, analysing and interpreting practical, assignment or project results)*
PO5.	**Social Interactive Skills and team-work:** Eliciting networking with people, mediating disagreement and helping reach conclusions in group settings. Functioning effectively as an individual, and as a member in diverse groups, and in multidisciplinary settings exhibiting adaptability, leadership quality and team-building. *(Working together as team in practicals, working in groups for assignments, presentations and projects completions)*
PO6.	**Awareness towards Environment and Sustainable Development:** Exhibit awareness and a concern for environmental issues; understand and realize the significance of co-habitation and co-evolution in attaining the needs of sustainable development. *(Analyze, Apply, Evaluate, Create, Differentiate, Compare, Classify)*
PSO1.	**Sound Botanical knowledge gain and application:** Identify the different groups of plants and gain the knowledge about plant biodiversity and its conservation. Share social and environmental consciousness with the fellow citizens and motivate them towards taking fundamental steps towards environmental conservation. Utilize the botanical knowledge for problem solving and for taking real time decisions while working with plants in fields. Demonstrate comprehensive knowledge and understanding of the fundamental concepts of Botany and its applications to allied disciplines like Chemistry, Microbiology, Biotechnology, Lifesciences, Statistics and Bioinformatics. *(Remember, Understand, Explain, Compare, Classify, Analyse, Apply to solve interdisciplinary problems)*
PSO2.	**Acquiring proficiency in botanical techniques and methodologies:** Learn and apply different techniques, protocols and methodologies. Acquire knowledge of good laboratory practices and acquire research skills required for industrial support services. Inculcate scientific temperament, good reasoning power, technological and analytical skills while designing the experiments. *(Explain, Evaluate, Differentiate, Compare, Classify, learn the skills necessary for progression to higher education, research and in industry-based job prospects)*

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POs, PSOs and COs for the three years Integrated B.Sc. Program

Programme Name: B.Sc. Botany Program Code: SIUSBOT
Expected Course Outcomes

Each course of the program aims at developing certain skills, attitudes and knowledge base of the students. The outline of Course Learning Outcomes is described below.

Semester	Course Code	Credits	Lectures/week	Course Name
1	SIUSBOT11	2.0	3	Plant Diversity – I

CO. No.	Course Outcome of SIUSBOT11 Upon completion of this course, student will be able to	Cognitive Level	Affinity with PO/ PSO
CO1	Identify and classify the diversity of bacteria, virus and algae.	R, U, Ap	PO3, PO5, PO6, PSO1, PSO2
CO2	Study the range of thallus in algae and acknowledge the economic importance of algae.	R, U, Ap	PO3, PO5, PO6, PSO1, PSO2
CO3	Identify and classify Phycomycetean fungi and also understand the different modes of nutrition in them with their applications in medicines and biotechnology.	R, U, Ap	PO3, PO5, PO6, PSO1, PSO2
CO4	Know the basic structure, classification, modes of nutrition in lichens along with their economic and ecological importance.	R, U, Ap	PO3, PO5, PO6, PSO1, PSO2
CO5	Learn and compare the lifecycles of *Riccia* and *Nephrolepis*.	R, U	PO3, PO5, PO6, PSO1, PSO2
CO6	Understand the stelar evolution in pteridophytes.	R, U	PO3, PO5, PO6, PSO1, PSO2

PO- Program Outcome, PSO-Program Specific outcome; CO-Course Outcome;
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create

Mapping of Plant Diversity – I Course COs with the POs and PSOs for B.Sc. (Botany) Programme

Mapping Matrix	Complex Problem Solving	Critical thinking	Reasoning ability and Rational thinking	Research Aptitude	Social Interactive Skills and team work	Awareness towards Environment and Sustainable Development	Sound Botanical knowledge gain and application	Acquiring proficiency in botanical techniques and methodologies
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	---	---	√	---	√	√	√	√
CO2	---	---	√	---	√	√	√	√
CO3	---	---	√	---	√	√	√	√
CO4	---	---	√	---	√	√	√	√
CO5	---	---	√	---	√	√	√	√
CO6	---	---	√	---	√	√	√	√

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POs, PSOs and COs for the three years Integrated B.Sc. Program

Programme Name: B.Sc. Botany Program Code: SIUSBOT
Expected Course Outcomes

Each course of the program aims at developing certain skills, attitudes and knowledge base of the students. The outline of Course Learning Outcomes is described below.

Semester	Course Code	Credits	Lectures/week	Course Name
1	SIUSBOT12	2.0	3	Form and Function – I

CO. No.	Course Outcome of SIUSBOT12 Upon completion of this course, student will be able to	Cognitive Level	Affinity with PO/ PSO
CO1	Know the basic components of cells w.r.t. their structure, and functions and enlist their importance.	R, U, Ap	PO2, PO3, PO5, PO6, PSO1, PSO2
CO2	Understand and differentiate the different stages of mitosis.	R, U, Ap, An	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO3	Acquire the knowledge of basic ecological concepts and learn the concept of bioremediation and analyse the role of different groups of organisms for the same	R, U, Ap, An	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO4	Study the concept of biodiversity and appreciate the biodiversity hotspots in India.	R, U, Ap, An	PO3, PO4, PO5, PO6, PSO1, PSO2
CO5	Understand the basics of inheritance and genetic variations and compare it with its modified ratios. Analyse the inheritance of multiple alleles.	R, U, Ap, An, E	PO1, PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO6	Learn the concepts in biometry and solve the problems based on measures of central tendency.	R, U, Ap, An, E	PO1, PO2, PO3, PO4, PO5, PO6, PSO1, PSO2

PO- Program Outcome, PSO-Program Specific outcome; CO-Course Outcome;
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create

Mapping of Form and Function – I Course COs with the POs and PSOs for B.Sc. (Botany) Programme

Mapping Matrix	Complex Problem Solving	Critical thinking	Reasoning ability and Rational thinking	Research Aptitude	Social Interactive Skills and team work	Awareness towards Environment and Sustainable Development	Sound Botanical knowledge gain and application	Acquiring proficiency in botanical techniques and methodologies
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	---	√	√	---	√	√	√	√
CO2	---	√	√	√	√	√	√	√
CO3	---	√	√	√	√	√	√	√
CO4	---	---	√	√	√	√	√	√
CO5	√	√	√	√	√	√	√	√
CO6	√	√	√	√	√	√	√	√

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POs, PSOs and COs for the three years Integrated B.Sc. Program

Programme Name: B.Sc. Botany Program Code: SIUSBOT
Expected Course Outcomes

Each course of the program aims at developing certain skills, attitudes and knowledge base of the students. The outline of Course Learning Outcomes is described below.

Semester	Course Code	Credits	Lectures/week	Course Name
1	SIUSBOTP1.1	3.0	6	Plant Diversity I (Practical-I) & Form and Function I (Practical-II)

CO. No.	Course Outcome of SIUSBOTP1.1 Upon completion of this course, student will be able to	Cognitive Level	Affinity with PO/ PSO
CO1	Observe the structure and diversity of bacteria, virus, algae, fungi, and lichens along with their economic importance.	R, U, Ap	PO2, PO4, PO5, PO6, PSO1, PSO2
CO2	Learn the structures in bryophytes, pteridophytes and lichens and acknowledge their economic and ecological significance.	R, U, Ap	PO2, PO4, PO5, PO6, PSO1, PSO2
CO3	Study the different stages of mitosis and identify the karyotypes and cell components.	R, U, Ap, An	PO2, PO4, PO5, PO6, PSO1, PSO2
CO4	Acquire the skills of data representation and solve the problems in biometry.	R, U, Ap, An, E, C	PO1, PO2, PO3, PO4, PO5, PSO1, PSO2
CO5	Appreciate the ecological adaptations in different groups of plants and biodiversity hotspots of India.	R, U, Ap, An	PO3, PO4, PO5, PO6, PSO1, PSO2
CO6	Know the inheritance patterns in genetics and work out the problems based on the same.	R, U, Ap, An, E	PO1, PO2, PO3, PO4, PO5, PO6, PSO1, PSO2

PO- Program Outcome, PSO-Program Specific outcome; CO-Course Outcome;
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create

Mapping of Practical – I (Plant Diversity - I) & Practical – II (Form and Function - I) Course COs with the POs and PSOs for B.Sc. (Botany) Programme

Mapping Matrix	Complex Problem Solving	Critical thinking	Reasoning ability and Rational thinking	Research Aptitude	Social Interactive Skills and team work	Awareness towards Environment and Sustainable Development	Sound Botanical knowledge gain and application	Acquiring proficiency in botanical techniques and methodologies
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	---	√	---	√	√	√	√	√
CO2	---	√	---	√	√	√	√	√
CO3	---	√	---	√	√	√	√	√
CO4	√	√	√	√	√	---	√	√
CO5	---	---	√	√	√	√	√	√
CO6	√	√	√	√	√	√	√	√

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POs, PSOs and COs for the three years Integrated B.Sc. Program

Programme Name: B.Sc. Botany Program Code: SIUSBOT
Expected Course Outcomes

Each course of the program aims at developing certain skills, attitudes and knowledge base of the students. The outline of Course Learning Outcomes is described below.

Semester	Course Code	Credits	Lectures/week	Course Name
2	SIUSBOT21	2.0	3	Plant Diversity – I

CO. No.	Course Outcome of SIUSBOT21 Upon completion of this course, student will be able to	Cognitive Level	Affinity with PO/ PSO
CO1	Study the structures and life cycles in *Cycas* along with economic and ecological significance of gymnosperms.	R, U, Ap	PO3, PO4, PO5, PO6, PSO1, PSO2
CO2	Understand geological time scale and analyse the evolutionary trends in plants.	R, U, Ap, An	PO2, PO3, PO4, PO6, PSO1, PSO2
CO3	Learn basic methods of angiosperm classification.	R, U	PO2, PO4, PO6, PSO1, PSO2
CO4	Acquire the knowledge of angiospermic families with economic importance.	R, U, Ap	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO5	Observe different morphological forms of leaves and inflorescence in plants.	R, U, Ap	PO3, PO4, PO5, PO6, PSO1, PSO2
CO6	Appreciate the various wonders of plant kingdom with their interesting and unique aspects.	R, U	PO3, PO5, PO6, PSO1, PSO2

PO- Program Outcome, PSO-Program Specific outcome; CO-Course Outcome;
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create

Mapping of Plant Diversity – I Course COs with the POs and PSOs for B.Sc. (Botany) Programme

Mapping Matrix	Complex Problem Solving	Critical thinking	Reasoning ability and Rational thinking	Research Aptitude	Social Interactive Skills and team work	Awareness towards Environment and Sustainable Development	Sound Botanical knowledge gain and application	Acquiring proficiency in botanical techniques and methodologies
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	---	---	√	√	√	√	√	√
CO2	---	√	√	√	---	√	√	√
CO3	---	√	---	√	---	√	√	√

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CO4	---	√	√	√	√	√	√	√
CO5	---	---	√	√	√	√	√	√
CO6	---	---	√	---	√	√	√	√

Programme Name: B.Sc. Botany Program Code: SIUSBOT
Expected Course Outcomes

Each course of the program aims at developing certain skills, attitudes and knowledge base of the students. The outline of Course Learning Outcomes is described below.

Semester	Course Code	Credits	Lectures/week	Course Name
2	SIUSBOT22	2.0	3	Form and Function – I

CO. No.	Course Outcome of SIUSBOT22 Upon completion of this course, student will be able to	Cognitive Level	Affinity with PO/ PSO
CO1	Know the basic anatomy and tissue systems in higher plants.	R, U	PO3, PO4, PSO1, PSO2
CO2	Learn the different types of epidermal tissue systems and their significance.	R, U	PO3, PO4, PSO1, PSO2
CO3	Understand the role of photosynthetic pigments and light in the process of photosynthesis.	R, U, Ap, An	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO4	Acquire the knowledge of mechanism of photosynthesis and role of enzymes in plant metabolism.	R, U, Ap, An	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO5	Study the plants used in health care cosmetics.	R, U, Ap	PO3, PO4, PO5, PO6, PSO1, PSO2
CO6	Expand their knowledge w.r.t scope, career, and new trends in horticulture.	R, U, Ap	PO3, PO4, PO5, PO6, PSO1, PSO2

PO- Program Outcome, PSO-Program Specific outcome; CO-Course Outcome;
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create

Mapping of Form and Function – I Course COs with the POs and PSOs for B.Sc. (Botany) Programme

Mapping Matrix	Complex Problem Solving	Critical thinking	Reasoning ability and Rational thinking	Research Aptitude	Social Interactive Skills and team work	Awareness towards Environment and Sustainable Development	Sound Botanical knowledge gain and application	Acquiring proficiency in botanical techniques and methodologies
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PSO1**	**PSO2**
CO1	---	---	√	√	---	---	√	√

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CO2	---	---	√	√	---	---	√	√
CO3	---	√	√	√	√	√	√	√
CO4	---	√	√	√	√	√	√	√
CO5	---	---	√	√	√	√	√	√
CO6	---	---	√	√	√	√	√	√

Programme Name: B.Sc. Botany Program Code: SIUSBOT
Expected Course Outcomes

Each course of the program aims at developing certain skills, attitudes and knowledge base of the students. The outline of Course Learning Outcomes is described below.

Semester	Course Code	Credits	Lectures/week	Course Name
2	**SIUSBOTP2.1**	**3.0**	**6**	**Plant Diversity I (Practical-I) & Form and Function I (Practical-II)**

CO. No.	Course Outcome of SIUSBOTP2.1 Upon completion of this course, student will be able to	Cognitive Level	Affinity with PO/ PSO
CO1	Observe the structure of *Cycas* plant. Also learn the economic and ecological significance of gymnosperms.	R, U, Ap, An	PO2, PO3, PO5, PO6, PSO1, PSO2
CO2	Learn the variations in the morphology of leaves and inflorescence in angiosperms and appreciate different plant wonders.	R, U, Ap, An	PO2, PO3, PO5, PO6, PSO1, PSO2
CO3	Study the angiospermic families as per theory with their plants of economic importance in laboratory as well as field excursions.	R, U, Ap, An	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO4	Learn the techniques to observe and understand the primary anatomical structure of vegetative parts of dicots and monocots.	R, U, Ap, An	PO2, PO3, PO5, PO6, PSO1, PSO2
CO5	Identify important medicinal plants and acknowledge their uses in human health and cosmetics.	R, U, Ap, An	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO6	Perform the technique of paper chromatography, study of the enzyme activity and learn about upcoming gardening techniques.	R, U, Ap, An, E	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2

PO- Program Outcome, PSO-Program Specific outcome; CO-Course Outcome;
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create

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Mapping of Practical – I (Plant Diversity - I) & Practical – II (Form and Function - I) Course COs with the POs and PSOs for B.Sc. (Botany) Programme

Mapping Matrix	Complex Problem Solving	Critical thinking	Reasoning ability and Rational thinking	Research Aptitude	Social Interactive Skills and team work	Awareness towards Environment and Sustainable Development	Sound Botanical knowledge gain and application	Acquiring proficiency in botanical techniques and methodologies
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	---	√	√	---	√	√	√	√
CO2	---	√	√	---	√	√	√	√
CO3	---	√	√	√	√	√	√	√
CO4	---	√	√	---	√	√	√	√
CO5	---	√	√	√	√	√	√	√
CO6	---	√	√	√	√	√	√	√

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Programme Name: B.Sc. Botany Program Code: SIUSBOT
Expected Course Outcomes

Each course of the program aims at developing certain skills, attitudes and knowledge base of the students. The outline of Course Learning Outcomes is described below.

Semester	Course Code	Credits	Lectures/week	Course Name
3	SIUSBOT31	2.0	3	Plant Diversity – II

CO. No.	Course Outcome of SIUSBOT31 Upon completion of this course, student will be able to	Cognitive Level	Affinity with PO/ PSO
CO1	Identify, classify and understand the lifecycles of algae and bryophytes with their economic importance.	R, U, Ap	PO3, PO6, PSO1, PSO2
CO2	Learn and apply the knowledge of algal culturing and commercial importance of bryophytes in agriculture	R, U, Ap, An,	PO1, PO3, PO4, PSO1, PSO2
CO3	Identify and classify angiosperms based on Bentham & Hooker's system of classification.	R, U, Ap, An, E	PO1, PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO4	Know the floral morphology and economic importance of various angiosperms.	R, U, Ap, An	PO1, PO2, PO3, PSO1, PSO2
CO5	Understand and apply the principle of gel electrophoresis.	R, U, Ap, An	PO2, PO4, PO6, PSO1, PSO2
CO6	Know principle and techniques of microscopy and chromatography.	R, U, Ap, An, E	PO1, PO2, PO3, PO4, PO5, PO6, PSO1, PSO2

PO- Program Outcome, PSO-Program Specific outcome; CO-Course Outcome;
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create

Mapping of Plant Diversity – II Course COs with the POs and PSOs for B.Sc. (Botany) Programme

Mapping Matrix	Complex Problem Solving	Critical thinking	Reasoning ability and Rational thinking	Research Aptitude	Social Interactive Skills and team work	Awareness towards Environment and Sustainable Development	Sound Botanical knowledge gain and application	Acquiring proficiency in botanical techniques and methodologies
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	---	---	√	---	---	√	√	√
CO2	√	---	√	√	---	---	√	√
CO3	√	√	√	√	√	√	√	√
CO4	√	√	√	---	---	---	√	√
CO5	---	√	---	√	---	√	√	√
CO6	√	√	√	√	√	√	√	√

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POs, PSOs and COs for the three years Integrated B.Sc. Program

Programme Name: B.Sc. Botany Program Code: SIUSBOT
Expected Course Outcomes

Each course of the program aims at developing certain skills, attitudes and knowledge base of the students. The outline of Course Learning Outcomes is described below.

Semester	Course Code	Credits	Lectures/week	Course Name
3	SIUSBOT32	2.0	3	Form and Function – II

CO. No.	Course Outcome of SIUSBOT32 Upon completion of this course, student will be able to	Cognitive Level	Affinity with PO/ PSO
CO1	Know ultrastructure and functions of cell organelles, microbodies and interphase nucleus.	R, U, An, E	PO2, PO3, PO4, PO6, PSO1, PSO2
CO2	Understand the structure and function of nucleic acids. Compare the cell divisions with gaining the knowledge of cell cycle and its regulation.	R, U, Ap, An, E,	PO1, PO2, PO3, PO4, PO5, PSO1, PSO2
CO3	Evaluate the cytological and genetic effects chromosomal aberrations, and pattern of maternal inheritance.	R, U, Ap, An, E	PO1, PO2, PO3, PO4, PO5, PSO1, PSO2
CO4	Learn and analyse the concepts of sex determination, sex linked, and sex influenced- sex limited traits.	R, U, Ap, An, E	PO1, PO2, PO3, PO4, PO5, PSO1, PSO2
CO5	Understand and compare sedimentary biogeochemical cycles	R, U, Ap, An	PO1, PO3, PO4, PO5, PO6, PSO1, PSO2
CO6	Evaluate various ecological factors affecting soil characteristics and know the concepts of community ecology.	R, U, Ap, An, E	PO1, PO3, PO4, PO5, PO6, PSO1, PSO2

PO- Program Outcome, PSO-Program Specific outcome; CO-Course Outcome;
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create

Mapping of Form and Function – II Course COs with the POs and PSOs for B.Sc. (Botany) Programme

Mapping Matrix	Complex Problem Solving	Critical thinking	Reasoning ability and Rational thinking	Research Aptitude	Social Interactive Skills and team work	Awareness towards Environment and Sustainable Development	Sound Botanical knowledge gain and application	Acquiring proficiency in botanical techniques and methodologies
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	---	√	√	√	---	√	√	√
CO2	√	√	√	√	√	---	√	√
CO3	√	√	√	√	√	---	√	√

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POs, PSOs and COs for the three years Integrated B.Sc. Program

CO4	√	√	√	√	√	---	√	√
CO5	√	---	√	√	√	√	√	√
CO6	√	---	√	√	√	√	√	√

Programme Name: B.Sc. Botany Program Code: SIUSBOT

Expected Course Outcomes

Each course of the program aims at developing certain skills, attitudes and knowledge base of the students. The outline of Course Learning Outcomes is described below.

Semester	Course Code	Credits	Lectures/week	Course Name
3	SIUSBOT33	2.0	3	Current Trends in Plant Sciences – I

CO. No.	Course Outcome of SIUSBOT33 Upon completion of this course, student will be able to	Cognitive Level	Affinity with PO/ PSO
CO1	Know the concepts of Pharmacognosy, Pharmacopoeia and Monographs and evaluate the scope of Ayurveda system.	R, U, Ap	PO2, PO3, PO4, PO5, PSO1, PSO2
CO2	Learn the plants from Grandma's pouch and analyse the potential of secondary metabolites with its associated adulterations.	R, U, Ap, An, E	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO3	Understand and differentiate between basic and modern trends in forestry. Acquire and apply the knowledge of ecotourism.	R, U, Ap	PO4, PO5, PO6, PSO1, PSO2
CO4	Identify and appreciate the knowledge of commercially important plants	R, U, Ap	PO3, PO4, PO5, PO6, PSO1, PSO2
CO5	Acknowledge the potential of aromatherapy, botanicals and nutraceuticals.	R, U, Ap, An	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO6	Apply the knowledge of plant-based enzymes in industry and biofuels.	R, U, Ap, An, E	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2

PO- Program Outcome, PSO-Program Specific outcome; CO-Course Outcome;
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create

Mapping of Form and Function – III Course COs with the POs and PSOs for B.Sc. (Botany) Programme

Mapping Matrix	Complex Problem Solving	Critical thinking	Reasoning ability and Rational thinking	Research Aptitude	Social Interactive Skills and team work	Awareness towards Environment and Sustainable Development	Sound Botanical knowledge gain and application	Acquiring proficiency in botanical techniques and methodologies
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2

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CO1	---	√	√	√	√	---	√	√
CO2	---	√	√	√	√	√	√	√
CO3	---	---	---	√	√	√	√	√
CO4	---	---	√	√	√	√	√	√
CO5	---	√	√	√	√	√	√	√
CO6	---	√	√	√	√	√	√	√

Programme Name: B.Sc. Botany Program Code: SIUSBOT
Expected Course Outcomes

Each course of the program aims at developing certain skills, attitudes and knowledge base of the students. The outline of Course Learning Outcomes is described below.

Semester	Course Code	Credits	Lectures/week	Course Name
3	**SIUSBOTP3.1**	**3.0**	**9**	**Practical I (Plant Diversity II), Practical II (Form and Function II) & Practical III (Current Trends in Plant Sciences I)**

CO. No.	Course Outcome of SIUSBOT41 Upon completion of this course, student will be able to	Cognitive Level	Affinity with PO/ PSO
CO1	Identify, classify and observe the structural features in algae and bryophytes	R, U, Ap, An	PO3, PO5, PO6, PSO1, PSO2
CO2	Analyse different morphological variations in the floral structures and learn angiospermic families with economic importance.	R, U, Ap, An	PO2, PO3, PO5, PO6, PSO1, PSO2
CO3	Understand and apply modern techniques in plant diversity studies.	R, U, Ap, An, E	PO2, PO3, PO4, PO5, PSO1, PSO2
CO4	Observe and understand the ultrastructure of cell organelles, nucleic acids, inheritance pattern & chromosomal aberrations.	R, U, Ap, An	PO1, PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO5	Learn and apply the concepts of ecological experimentations.	R, U, Ap, An, E	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO6	Identify and acknowledge the significance of herbal drugs with their adulterants & economic importance.	R, U, Ap, An, E	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO7	Appreciate the plant wealth, plant diversity, forest types through field visits and ecotourism.	R, U, Ap, An, E	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2

PO- Program Outcome, PSO-Program Specific outcome; CO-Course Outcome;
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create

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POs, PSOs and COs for the three years Integrated B.Sc. Program

Mapping of Practical I (Plant Diversity II), Practical II (Form and Function II) & Practical III (Current Trends in Plant Sciences I) Course COs with the POs and PSOs for B.Sc. (Botany) Programme

Mapping Matrix	Complex Problem Solving	Critical thinking	Reasoning ability and Rational thinking	Research Aptitude	Social Interactive Skills and team work	Awareness towards Environment and Sustainable Development	Sound Botanical knowledge gain and application	Acquiring proficiency in botanical techniques and methodologies
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	--	--	√	--	√	√	√	√
CO2	--	√	√	--	√	√	√	√
CO3	--	√	√	√	√	--	√	√
CO4	√	√	√	√	√	√	√	√
CO5	--	√	√	√	√	√	√	√
CO6	--	√	√	√	√	√	√	√
CO7	--	√	√	√	√	√	√	√

Programme Name: B.Sc. Botany Program Code: SIUSBOT
Expected Course Outcomes

Each course of the program aims at developing certain skills, attitudes and knowledge base of the students. The outline of Course Learning Outcomes is described below.

Semester	Course Code	Credits	Lectures/week	Course Name
4	SIUSBOT41	2.0	3	Plant Diversity – II

CO. No.	Course Outcome of SIUSBOT41 Upon completion of this course, student will be able to	Cognitive Level	Affinity with PO/ PSO
CO1	Learn the general characters of fungi with the life cycles of *Aspergillus*, *Xylaria* and *Agaricus.*	R, U, Ap	PO3, PO4, PO5, PO6, PSO1, PSO2
CO2	Know the basic concepts of plant pathology & applications of fungi as bio-controlling agent.	R, U, Ap	PO3, PO4, PO5, PO6, PSO1, PSO2
CO3	Learn the salient features of Psilophyta and Lepidophyta among the pteridophytes along with the life cycle of *Selaginella.*	R, U, Ap	PO3, PO4, PO5, PO6, PSO1, PSO2

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CO4	Understand the concept of Geological time scale and fossil formation process with prescribed form genera.	R, U, Ap	PO3, PO4, PO5, PO6, PSO1, PSO2
CO5	Expand their knowledge on gymnosperms with life cycles of *Pinus*.	R, U, Ap	PO3, PO4, PO5, PO6, PSO1, PSO2
CO6	Explore the economic importance of gymnosperms.	R, U, Ap	PO3, PO4, PO5, PO6, PSO1, PSO2

PO- Program Outcome, PSO-Program Specific outcome; CO-Course Outcome;
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create

Mapping of Plant Diversity – II Course COs with the POs and PSOs for B.Sc. (Botany) Programme

Mapping Matrix	Complex Problem Solving	Critical thinking	Reasoning ability and Rational thinking	Research Aptitude	Social Interactive Skills and team work	Awareness towards Environment and Sustainable Development	Sound Botanical knowledge gain and application	Acquiring proficiency in botanical techniques and methodologies
	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PSO1**	**PSO2**
CO1	---	---	√	√	√	√	√	√
CO2	---	---	√	√	√	√	√	√
CO3	---	---	√	√	√	√	√	√
CO4	---	---	√	√	√	√	√	√
CO5	---	---	√	√	√	√	√	√
CO6	---	---	√	√	√	√	√	√

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POs, PSOs and COs for the three years Integrated B.Sc. Program

Programme Name: B.Sc. Botany Program Code: SIUSBOT
Expected Course Outcomes

Each course of the program aims at developing certain skills, attitudes and knowledge base of the students. The outline of Course Learning Outcomes is described below.

Semester	Course Code	Credits	Lectures/week	Course Name
4	SIUSBOT42	2.0	3	Form and Function – II

CO. No.	Course Outcome of SIUSBOT42 Upon completion of this course, student will be able to	Cognitive Level	Affinity with PO/ PSO
CO1	Understand the different types of mechanical and secretory tissues with vascular bundles in the plant.	R, U, Ap	PO3, PO4, PO5, PO6, PSO1, PSO2
CO2	Know the process of secondary growth and its different formations in plant organs.	R, U, Ap, An	PO3, PO4, PO5, PO6, PSO1, PSO2
CO3	Gain the knowledge of various processes related to respiration & photo respiration.	R, U, Ap, An	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO4	Analyse the effect of light on flowering in plants also understand the mechanism & applications of vernalization.	R, U, Ap, An	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO5	Learn the fundamentals of DNA replication and compare the same in prokaryotes and eukaryotes.	R, U, Ap, An	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO6	Explore the concept of central dogma emphasizing on transcription & mRNA processing.	R, U, Ap, An	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2

PO- Program Outcome, PSO-Program Specific outcome; CO-Course Outcome;
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create

Mapping of Form and Function – II Course COs with the POs and PSOs for B.Sc. (Botany) Programme

Mapping Matrix	Complex Problem Solving	Critical thinking	Reasoning ability and Rational thinking	Research Aptitude	Social Interactive Skills and team work	Awareness towards Environment and Sustainable Development	Sound Botanical knowledge gain and application	Acquiring proficiency in botanical techniques and methodologies
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	---	---	√	√	√	√	√	√
CO2	---	---	√	√	√	√	√	√
CO3	---	√	√	√	√	√	√	√

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CO4	---	√	√	√	√	√	√	√
CO5	---	√	√	√	√	√	√	√
CO6	---	√	√	√	√	√	√	√

Programme Name: B.Sc. Botany Program Code: SIUSBOT
Expected Course Outcomes

Each course of the program aims at developing certain skills, attitudes and knowledge base of the students. The outline of Course Learning Outcomes is described below.

Semester	Course Code	Credits	Lectures/week	Course Name
4	**SIUSBOT43**	**2.0**	**3**	**Current Trends in Plant Sciences – I**

CO. No.	Course Outcome of SIUSBOT43 Upon completion of this course, student will be able to	Cognitive Level	Affinity with PO/ PSO
CO1	Explore the basic concepts in horticulture and its branches.	R, U, Ap	PO3, PO4, PO5, PO6, PSO1, PSO2
CO2	Learn the technique of indoor gardening and plants suitable for various garden locations with styles of flower arrangements.	R, U, Ap	PO3, PO4, PO5, PO6, PSO1, PSO2
CO3	Know the various sterilisation techniques and different in-vitro methods in plant tissue culture.	R, U, Ap, An	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO4	Expand the knowledge of gene cloning with respect to enzymes and vectors used.	R, U, Ap, An	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO5	Apply the concepts of Biostatistics for problem solving and comprehend the fundamental concepts related to descriptive and inferential biostatistics.	R, U, Ap, An, E	PO1, PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO6	Understand the concept of databases and its applications with the use of bioinformatics tools	R, U, Ap, An	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2

PO- Program Outcome, PSO-Program Specific outcome; CO-Course Outcome;
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create

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POs, PSOs and COs for the three years Integrated B.Sc. Program

Mapping of Form and Function – III Course COs with the POs and PSOs for B.Sc. (Botany) Programme

Mapping Matrix	Complex Problem Solving	Critical thinking	Reasoning ability and Rational thinking	Research Aptitude	Social Interactive Skills and team work	Awareness towards Environment and Sustainable Development	Sound Botanical knowledge gain and application	Acquiring proficiency in botanical techniques and methodologies
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	---	---	√	√	√	√	√	√
CO2	---	---	√	√	√	√	√	√
CO3	---	√	√	√	√	√	√	√
CO4	---	√	√	√	√	√	√	√
CO5	√	√	√	√	√	√	√	√
CO6	---	√	√	√	√	√	√	√

Programme Name: B.Sc. Botany Program Code: SIUSBOT
Expected Course Outcomes

Each course of the program aims at developing certain skills, attitudes and knowledge base of the students. The outline of Course Learning Outcomes is described below.

Semester	Course Code	Credits	Lectures/week	Course Name
4	SIUSBOTP4.1	3.0	9	Practical I (Plant Diversity II), Practical II (Form and Function II) & Practical III (Current Trends in Plant Sciences I)

CO. No.	Course Outcome of SIUSBOTP4.1 Upon completion of this course, student will be able to	Cognitive Level	Affinity with PO/ PSO
CO1	Observe the structures in fungi, pteridophytes and gymnosperms as per theory.	R, U, Ap	PO3, PO4, PO5, PO6, PSO1, PSO2
CO2	Acquire the knowledge of plant fossils & fungal diseases.	R, U, Ap, An	PO3, PO4, PO5, PO6, PSO1, PSO2
CO3	Identify different types of mechanical and secretory tissues in plants. Learn secondary growth by sectioning technique.	R, U, Ap, An	PO3, PO4, PO5, PO6, PSO1, PSO2

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CO4	Perform the plant physiology experiments to enhance the concepts.	R, U, Ap, An, E	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO5	Apply the knowledge of sequencing for DNA and Amino acids.	R, U, Ap, An, E	PO1, PO2, PO3, PO4, PO5, PSO1, PSO2
CO6	Create different styles of flower arrangements and indoor gardens.	R, U, Ap, An, C	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO7	Solve the problems of biostatistics & explore the different bioinformatics tools.	R, U, Ap, An, E	PO1, PO2, PO3, PO4, PO5, PO6, PSO1, PSO2
CO8	Appreciate the plant wealth, plant diversity, garden styles through field visits and exhibitions.	R, U, Ap, An	PO2, PO3, PO4, PO5, PO6, PSO1, PSO2

PO- Program Outcome, PSO-Program Specific outcome; CO-Course Outcome;
Cognitive Level: R-Remember; U-Understanding; Ap-Apply; An-Analyze; E-Evaluate; C-Create

Mapping of Practical I (Plant Diversity II), Practical II (Form and Function II) & Practical III (Current Trends in Plant Sciences I) Course COs with the POs and PSOs for B.Sc. (Botany) Programme

Mapping Matrix	Complex Problem Solving	Critical thinking	Reasoning ability and Rational thinking	Research Aptitude	Social Interactive Skills and team work	Awareness towards Environment and Sustainable Development	Sound Botanical knowledge gain and application	Acquiring proficiency in botanical techniques and methodologies
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	--	--	√	√	√	√	√	√
CO2	--	--	√	√	√	√	√	√
CO3	--	--	√	√	√	√	√	√
CO4	--	√	√	√	√	√	√	√
CO5	√	√	√	√	√	--	√	√
CO6	--	√	√	√	√	√	√	√
CO7	√	√	√	√	√	√	√	√
CO8	--	√	√	√	√	√	√	√

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