DAYALBAGH EDUCATIONAL INSTITUTE
DEPARTMENT OF BOTANY (FACULTY OF SCIENCE)

COURSE LIST & COURSE OUTCOME

S.No.	Course Number	Course Title	Credits	End Sem. Exam. Exists	Theory / Practical	Course Outcome
1.	ESC191	Environmental Studies	2.0	No	T	It is a core course. Motto of this course is to create awareness amongst all the students about environment, environment related problems, harms of over-exploitation of natural resources and all possible solutions to mitigate environmental hazards. Eco friendly solutions for a sustainable development with case studies will make the learning more meaningful
2.	BOA101	Ecosystem And Its Dymanics	3.0	Yes	T	It is an Elective course Ecology of plants community & dynamics; Ecosystems and biotic interactions; Response of plant to stress conditions; Importance of soil; Biogeochemical cycles and their importance will be studied
3.	BOH101	Botany Theory	3.0	Yes	T	It is an introductory half course which provides an introduction to the classification, relationships, structure, and function of plants. Topics include reproduction and development of seed and non-seed plants, levels of organization, form and function of systems, and a survey of major taxa. The course also introduce students to basic concepts of genetics and cellular and organelles structure and function. General account and importance of important plant groups and various disciplines of plant Sciences are discussed briefly
4.	BOH102	Botany Practical	3.0	Yes	P	The laboratory exercises are coordinated with lecture topics including field exercises.
5.	BOH181	Environmental Sciences	2.5	Yes	T	It is a non faculty half course. Objective is to create awareness for a safe ,sustainable and eco friendly environment To study environmental ethics and laws
6.	BOW101	Maintenance Of Botanical Garden I	2.0	No	P	It is a work experience based course. Importance and utility of botanical garden in public welfare and botanical studies. Practical knowledge of Preparation of flower beds, seed beds and pots for growing seasonal and perennial ornamentals etc. will be given. Knowledge of Layout and designing of a garden and lawns; tillage, drainage, manuring, application of fertilizers and weeding; Vermi composting etc. will be imparted. Propagation techniques; Collection and preservation of seeds, fruits, flowers and bulbs will be taught
7.	BOW102	Work Experience-Dairy Products I	2.0	No	P	It is a work experience based course. Students will get acquainted with upkeep of Dairy and its appliances. Milk, its composition and constituents, Adulteration in milk. Practical training of preparing traditional milk products-Khoa, Chenna/Paneer, Dahi, Srikhand, Flavoured milk etc. will be imparted.
8.	BOW103	Modern Crop Production Tech. I	2.0	No	P	It is a work experience based course. Practical knowledge of disease and Pest Management in Kharif Crops will be imparted through Field Survey, Collection of diseased plant parts, identification of major fungal, bacterial, and viral diseases and insects and phytonematodes
9.	BOW104	Techq.In Cell & Molecular Biology 1	2.0	No	P	It is a work experience based course. Laboratory practices and maintenance of equipments and Instrumentation will be given. Practical knowledge To measure pH ;To prepare buffer and other solutions will be given.
10.	BOW105	Biofertilizers I	2.0	No	P	It is a work experience based course. Students will be able to identify ,isolate produce and maintain BGA from rice field ecosystem.
11.	BOW107	Prot.Prod.Tech.:Mushroom&Spir.Cul.	2.0	No	P	It is a work experience based course. Preparation and Product Development of Button Mushroom *(Agaricus Bisporus)* and Spirulina Production will be taught.
12.	BOM101	Algae And Lichens	2.0	Yes	T	Large diverse group important to study to mitigate environment related problems and food crisis. Micro flora have vital role for well being of next generation. Symbiotic relationship between algae and fungi is exemplified by study of lichens
13.	BOM102	Fungi And Plant Pathology	2.0	Yes	T	Students will be able to differentiate between algae and fungi To impart knowledge related to general characters; nutrition; reproduction; ultra structure ,economic importance and

						classification of fungi Students will learn about true and allied fungi as well as gain knowledge of important fungal diseases and their life cycle .
14.	BOM103	Practical	4.0	Yes	P	Practicals based on BOM 101 & BOM 102 through microscopic slide preparations; permanent slides and museum specimens will be given.
15.	BOM104	Seminar & Group Discussion	0.5	Yes	P	Group discussions will be held on topics based on BOM 101 & BOM 102 .Assessment will be done on subject content; presentation; ability to answer questions etc. Purpose is to enhance skill of public speaking and develop confidence along with gaining subject knowledge
16.	BOH231 / BOH251	Botany-Theory	3.0	Yes	T	It is a non faculty half course. General account and importance of important plant groups and various disciplines of plant Sciences are discussed briefly
17.	BOH232/ BOH252	Botany-Practical	3.0	Yes	P	It is a non faculty half course. The laboratory exercises are coordinated with lecture topics including field exercises.
18.	BOW201	Maintenance Of Botanical Garden II	2.0	No	P	It is a work experience based course. vegetative plant propagation techniques; bonsai; cultivation and care of cacti and succulents ; hedges; climbers etc. will be taught.
19.	BOW202	Work Experience-Dairy Products II	2.0	No	P	It is a work experience based course. Practical training of Keeping dairy records ; Understanding of Cattle housing; acquaintance with important breeds of cattle ; computation of ration for livestock will be imparted.
20.	BOW203	Modern Crop Production Tech. II	2.0	No	P	It is a work experience based course. Practical knowledge of disease and Pest Management in Rabi Crops will be imparted through Field Survey, Collection of diseased plant parts, identification of major fungal, bacterial, and viral diseases and insects and phyto nematodes
21.	BOW204	Techq.In Cell & Molecular Biology 2	2.0	No	P	It is a work experience based course. Cytological Techniques mainly staining; Differential staining; micrometry ; cell counting etc. will be done
22.	BOW205	Biofertilizers II	2.0	No	P	It is a work experience based course. Students will learn Preservation and Production techniques for BGA.
23.	BOW207	Prot.Prod.Tech.:Mushroom&Spir.Cul.	2.0	No	P	It is a work experience based course. Student will learn Preparation and Product Development of Oyster Mushroom and Spirulina sps, etc. Quality Testing, Packing and Marketing
24.	BOM201	Bacteria, Virus And Mycoplasma	2.0	Yes	T	Students will learn salient features, Nature and characteristics, of bacterial cell; viruses; Mycoplasma; and Cyanobacteria. They will be able to differentiate among these microbes.
25.	BOM202	Cell Biology	2.0	Yes	T	Basic knowledge of Cell as a unit of structure and function; its evolution and Origin along with Organization and function of various cell organelles; cell cycle and genetic material will be imparted
26.	BOM203	Practical	4.0	Yes	P	Practicals based on BOM 201 & BOM 202 through microscopic slide preparations; permanent slides and museum specimens will be given.
27.	BOM204	Seminar & Group Discussion	0.5	No	P	Group discussions will be held on topics based on BOM 201 & BOM 202 .Assessment will be done on subject content; presentation; ability to answer questions etc. Purpose is to enhance skill of public speaking and develop confidence along with gaining subject knowledge
28.	BOM301	Bryophyta	3.0	Yes	T	Students will be able to Compare morphological and structural organisation of gametophytes and sporophytes, reproductive mechanisms and their significance, evolutionary trends. Detailed life cycles of different bryophytes will be given. Students will learn about Ecology, economic importance etc.of bryophytes.
29.	BOM302	Pteridophyta	3.0	Yes	T	Students will learn Comparative organography, systematics reproduction and phylogeny of Pteridophytes; Life cycle of different genera will be taught. Students will learn about Early land plants and Evolution of stele
30.	BOM303	Gymnosperms & Palaeobotany	3.0	Yes	T	Ancient plants persist on earth .It is important for students to understand about past climate, phylogeny, economic values etc. Students will also learn about Palaeobotany ,which is a science pertinent to fossils and process of fossilization of past flora.
31.	BOM304	Practical	3.0	Yes	P	Practicals based on BOM 301,302,303
32.	BOM305	Seminar & Group Discussion	0.5	No	P	Group discussions will be held on topics based on BOM 301 302 & 303 .Assessment will be done on subject content; presentation; ability to answer questions etc. Purpose is to enhance skill of public speaking and develop confidence along with gaining subject knowledge
33.	BOM401	Anatomy Of Angiosperms	3.0	Yes	T	The course is designed ,to gain an understanding of the plant internal structure. The angiosperms anatomy is more emphasized, however comparative study of gymnosperms and lower vascular plants is also taught Further course is important to correlate between plant

						anatomy and the other major disciplines of biology, including taxonomy, cell biology, physiology, genetics, biochemistry, and ecology.
34.	BOM402	Biomolecules	3.0	Yes	T	At the end of the course, the students should be able to have a basic understanding of the structural and functional aspects of different biomolecules present in cells like Carbohydrates, Proteins, Lipids and Nucleic acids. They should also be able to appreciate the complex molecular mechanisms involved in regulation of gene expression in eukaryotes. The students will also be introduced to the field of bioinformatics and recombinant DNA technology.
35.	BOM403	Taxonomy Of Angiosperms	3.0	Yes	T	It is the backbone of all branches of science. Three main objectives are Identification, nomenclature and classification of plants. Students learn much more about morphology of plants also.
36.	BOM404	Practical	3.0	Yes	P	Practicals based on BOM 401;402;&403 through microscopic slide preparations; permanent slides and museum specimens will be given.
37.	BOM405	Seminar & Group Discussion	0.5	No	P	Group discussions will be held on topics based on BOM 401;402 & 403 .Assessment will be done on subject content; presentation; ability to answer questions etc. Purpose is to enhance skill of public speaking and develop confidence along with gaining subject knowledge
38.	BOM501	Taxonomy Of Angiosperms	4.0	Yes	T	Cladistics is a newer approach of systematics of clades or lineages with apomorphy and synapomorphy, Speciation provides valuable knowledge to students that how the present flora evolved from common ancestors. Botanical garden, herbarium, its preparation are few examples of classical taxonomy included in curriculum. Apart from this taxonomy provides an opportunity to come closer to nature to unveil facts associated with plants.
39.	BOM502	Cytogenetics And Plant Breeding	4.0	Yes	T	Students will be introduced to Concept of gene-fine structure analysis; gene structure and organisation; gene function and regulation; chromosome & chromatid segregation. Mutagenesis & repair mechanisms; Linkage and Crossing over will be discussed. Students will learn about plant breeding, and improvement of some selected crops.
40.	BOM503	Plant Physiology	4.0	Yes	T	Understanding Plant Physiology will help students to explore function and behaviour of plants with respect to nutrition uptake, movement and growth & development, effect of growth regulators, evapo-transpiration, sap movement. This understanding will help students to manipulate conditions to minimize stress and maximize plant productivity.
41.	BOM504	Ecology	4.0	Yes	T	Students will understand scope and relationship of ecology with other sciences, Plant community, Community structure and Ecosystems and biotic inter actions. Renewable and non-renewable resources; soil And biogeochemical cycles will be discussed.
42.	BOM505	Practical	8.0	Yes	P	Botany practical based on the courses BOM501, BOM502, BOM503 and BOM504.
43.	BOM601	Microbiology	4.0	Yes	T	Students will know details of bacterial cell; and viruses. They will learn about Microbiology of Air, water and soil as also Industrial ; food and milk ; and medical Microbiology. Microbial disease caused by Fungi, Bacteria, Virus, & Mycoplasma will be taught.
44.	BOM602	Embryology	4.0	Yes	T	This course gives a detailed account of the different aspects of embryology encompassing anther and ovule development, micro and megasporogenesis, pollination and fertilization in angiosperms. The students will also gain an understanding of different types of embryo and endosperm development seen in diverse families of flowering plants. This course also highlights the role of embryology in plant taxonomy and use of applied embryology in plant tissue culture
45.	BOM603	Applied Botany & Ethnobotany	4.0	Yes	T	This course deals with the importance of plants and plant products. Fruits, oils, beverages, fibres, wood and cork, condiments, spices, and drugs will be discussed through different examples. Students will also learn about ethnobotany; and Plants in folk religion and mythology.
46.	BOM604	Biometrics & Computer Applications	4.0	Yes	T	To provide the student's skills and expertise to understand, analyze and interpret biological data using bio-statistical techniques. The course also introduces the student's to data characteristics, representation, analytical test and technique in bio-metrics.
47.	BOM605	Practical	8.0	Yes	P	Botany practical based on the courses BOM601, BOM602, BOM603 and BOM604.

48.	BOM701	Algae, Fungi And Plant Diseases	4.0	Yes	T	Students will be able to compare range of structure, reproduction, classification, phylogeny and interrelationship of principal groups of algae. A Knowledge of life-history, alternation of generation, sexuality, pigments, Ecology and economic importance of algae will be imparted. Criteria used in the classification of fungiComparative study of the structure, reproduction, life cycle pattern of the principal groups of fungi will be given Economic importance of fungi, fungi as Biological tools, predacious fungi, Diseases caused by fungi (Potato, Pea, Groundnut, Paddy, Wheat and Bajra) and their control will be discussed.
49.	BOM702	Microbiology	4.0	Yes	T	Students will learn about Outline Classification of bacteria and general characters, Bacterial and virus induced diseases in plant, Nature of virulence, Plant toxin ; cancer; virus purification; Immune response ;Scope and application of microbes in Biotechnology; Microbial genetics; Microbial physiology; and Biosensors
50.	BOM703	Cell & Molecular Biology	4.0	Yes	T	Knowledge of various Techniques in cell and molecular Biology; Structural organization and function of intracellular organelles; Fundamental processes like DNA Replication ;Protein synthesis; Cell signaling; Cellular communication; Programmed cell death etc. will be imparted.
51.	BOM704	Ecology I	4.0	Yes	T	Detailed knowledge about Structure ; characters and classification of plant communities, Succession, Trophic structure ;Productivity of various ecosystems will be given
52.	BOM705	Practical I	4.0	Yes	P	Botany practical based on the courses BOM701 and BOM702.
53.	BOM706	Practical II	4.0	Yes	P	Botany practical based on the courses BOM703 and BOM704.
54.	BOM711	Plant Biodiversity	4.0	Yes	T	Student will be able to develop a basic knowledge about Plant Biodiversity and it importance. Understand structure of plant communities ;community classification; flow of energy in an ecosystem; centers of origins of plants; molecular and bar-coding; endangered plants database, endemism and Red Data Book, Global biodiversity information system and legislations related to Biodiversity
55.	BOM712	Microbiology	4.0	Yes	T	Knowledge of Outline Classification of bacteria including Archae bacteria; Specificity of plant pathogen interaction, disease manifestation; Plant toxin ; Viral diversity; cancer Purification of Virus; Quantitative and Qualitative assays of viruses; Immune responses; Scope and application of microbes in Biotechnology / Agriculture ; Microbial genetics; Microbial physiology; and Biosensors will be imparted.
56.	BOM713	Cell Biology	4.0	Yes	T	Cell is the basic structural and functional unit of life. advances in the cellular biology Cell composition and macromolecules present in the cell.Cellular organelles' structure and functions in the functioning of the cell ;Cellular energy generation and utilization of energy in cells; Molecular pathways of packaging and transport of proteins in the cell. Stages of mitotic and meiotic cell division and its molecular regulation and check points will be taught. Students will be able to apply their knowledge of cell biology to selected examples of changes or losses in cell function. These can include responses to environmental or physiological changes, or alterations of cell function brought about by mutation.
57.	BOM714	Introductory Molecular Biology	4.0	Yes	T	This course deals with Molecular biology. In this course, students will be taught all aspect of molecular biology right from replication of DNA to post-translational modification. It also describes the cloning of plasmid, gene of interest and purification of proteins. After going through this course students will get the confidence to apply basic science in translation research.
58.	BOM715	Practical	8.0	Yes	P	practical based on the courses BOM711, BOM712, BOM713, and BOM714.
59.	BOM801	Inheritance Biology	4.0	Yes	T	Structure of Chromosome, Chromosome Modeling/Architecture, Gene mapping methods, ; Extra chromosomal inheritance; Microbial genetics; Gene silencing, RNAi; Quantitative genetics; Genetics of cancer, cell division and immune response along with Statistical Methods will be discussed.
60.	BOM802	Plant Biochemistry	4.0	Yes	T	A detailed understanding of General aspects of Enzymology; Photosynthesis; C3, C4, and CAM pathways;

						Respiration and lipid metabolism; nitrogen and sulphur metabolism; Sensory photobiology will be given.
61.	BOM803	Ecology II	4.0	Yes	T	Natural resources and their management; Biological Diversity; Major types of Ecosystems of the World; soil; Concept of Microbial Ecology; Microbial ecological relationship and Microbial succession will be taught in details.
62.	BOM804	Taxonomy	4.0	Yes	T	Principles of classification and criteria employed in different systems; Modern tools for taxonomic data; Morphological, Embryological, Palynological, Cytological, Phytochemical and Molecular Systematics; Phylogeny of angiosperms; Diagnostic features of different families and range of floral characters will taught in details.
63.	BOM805	Practical I	4.0	Yes	P	Botany practical based on the courses BOM801and BOM802.
64.	BOM806	Practical II	4.0	Yes	P	Botany practical based on the courses BOM803 and BOM804.
65.	BOM811	Genetics	4.0	Yes	T	Important objectives of the course is to understand the inheritance of characters, understanding of genotypes and phenotypes and their role in species evolution. Study of quantitative traits and population genetics, and mutations, and mapping of genes. Linkage mapping and mapping populations and their role in genetic and breeding
66.	BOM812	Plant Metabolism, Growth & Develop.	4.0	Yes	T	Students will get detailed outline of Photosynthesis; Respiration; Nitrogen metabolism; Lipid metabolism; Light control of Plant development; Plant growth regulators and elicitors; Signal Transduction; Stress Physiology and Plant responses to pathogens and defense mechanisms.
67.	BOM813	Cell,Tissue Culture& Differentiat.	4.0	Yes	T	This paper trains the students in theory and practical how to maintain or grow plant cells, tissues and organ under sterile conditions. Students learn the technique of micro propagation which is a useful technique at industrial level production of plants.
68.	BOM814	Bioinformatics & Biostatistics	4.0	Yes	T	Nowadays Bioinformatics has already gained popularity among all life sciences courses. This is fusion course originated from an amalgamation of biology and information technology. At present time huge data analysis is the big problem. In this course, student will learn all soft wares related biological research because these soft wares will provide the prediction of any biological query in a fraction of a second. Further validation will be done by wet lab experiment.
69.	BOM815	Practical	8.0	Yes	P	Practicals based on BOM 811,812,813,814
70.	BOM001	Basic Res. Meth., Sc.Comput. & Anal.	4.0	Yes	T	Students will know Meaning of research, types of research, research process, problem formulation and techniques, Methods of data collection and analysis; Interpretation& Reporting. Patents, copyrights, trademarks, trade secrets, IPR.
71.	BOM002	Pre-Dissertation	4.0	No	P	preparation and presentation of M.Sc. synopsis in consultation with concerning supervisor.
72.	BOM901	Dissertation	12.0	Yes	T	Project work, including submission of M.Sc. dissertation
73.	BOM902	Plant Biotechnology	4.0	Yes	T	The course deals with providing an overview of the various tools and techniques used in plant biotechnology. The students will be introduced to the field of 'omics'-genomics, proteomics and metabolomics. They will also get an understanding of intellectual property rights and their role in research work. The course also involves the study of plant tissue culture techniques and some aspects of microbial biotechnology.
74.	BOM903	Environmental Pollution & Mngt.	4.0	Yes	T	Source and effect of pollution ; waste water and sewage treatment, reuse and recycling of water; afforestation, wild life management and satellite imagery and its application will be discussed.
75.	BOM904	Biology Of Reprod. Of Angiosperms	4.0	Yes	T	Flower Development and floral organ differentiation; Gender and Sexual dimorphism in plants: Evolution and diversity of sexual systems; Plant-pollinator interaction effect; applied pollination ecology. Phenology; mating systems.Male and female Gametes: *In vitro* and *in vivo* double fertilization ,physiology of embryogenesis and Seed Biology will be taught in detail.
76.	BOM905	Plant Resource Utilization& Conser.	4.0	Yes	T	Students will know about Plant Biodiversity: Concept, status in India, utilization and concerns. Sustainable development. Green revolution: Benefits and adverse consequences. Innovations for meeting world food demands. Strategies for conservation - *in situ* conservation ; *ex situ* conservation: Principles and practices

77.	BOM906	Molecular Techniques	4.0	Yes	T	Students will learn Techniques for DNA isolation , purification and detection from eukaryote and prokaryote; RFLP; DNA fingerprinting. Recombinant DNA technology: Southern and Nothern blotting. PCR: DNA amplification, electrophoretic methods. Autoradiography. Nucleotide sequencing and Molecular technique application: Genome mapping. Crop improvement.
78.	BOM907	Genetic Diversity Assessment	4.0	Yes	T	Students will learn Mathematical models of Genetic variation; Accessing molecular data on genetic diversity: DNA technologies and genome mapping; Applications and utilization of molecular techniques in genetic diversity; Molecular markers for rapid selection and improvement of crop plant; Genetic engineering applications; Technology and ethics; Genomics and proteomics and Bioinformatics.
79.	BOM908	Plant Physiology	4.0	Yes	T	Students get detailed knowledge of Plant growth regulators and elicitors; Flower Development; Sexual dimorphism in plants; Signal Transduction; Stress Physiology; Growth & Development
80.	BOM911	Prin.& Appl. Of Plant Biotechnology	4.0	Yes	T	Students learn techniques of molecular biology, genetic engineering and molecular breeding and in vitro secondary metabolite production. Students will be well prepared in the use of latest techniques of crop improvement which will stand them in good stead while looking for jobs.
81.	BOM912	Microbial Biotechnology	4.0	Yes	T	This course emphasizes on the applied aspects of microbes in industrial biotechnology. Apart from the general microbiology techniques, the students will study about the different types of fermenters, culture media and conditions used to culture microbes at large scale. The course also deals with providing an overview of the upstream and downstream processes involved in production of commercially useful products, ranging from antibiotics, single cell proteins and various enzymes like amylases, lipases, cellulases etc.
82.	BOM951	Dissertation I	8.0	Yes	T	Synopsis presentation of the M.Phil Dissertation
83.	BOM952	Dissertation II	16.0	Yes	T	Presentation and defending work of M.Phil Dissertation
84.	BOM953	Self Study Course	4.0	Yes	T	Learning of Advanced techniques and presenting them through self study.
85.	BOM954	Adv. Scientific Methodology& Analysis	4.0	Yes	T	Knowledge on Fundamentals of Statistical Analysis Correlation and Regression, and their application to life sciences.Basic principles of experimental design, Use of Computers and relevant software: Computer and its role in Research, Basics of Computer Operating Systems; Introduction to Presentation Software. Introduction to Internet Technologies will be imparted.
86.	BOM955	Biotechnology In Plant Industry	4.0	Yes	T	Basic knowledge of this course will make students to improve crop productivity in agriculture and farmers benefit from agricultural biotech seeds.
87.	BOM956	Organic Farming	4.0	Yes	T	Students will learn practices and significance of organic farming. Commercial exploitation of microorganisms in agriculture. Recycling of agro-waste. Sustainable Agriculture. Integrated Nutrient Management. Production of bio-fertilizers Importance of organic farming, composting techniques.
88.	BOM957	Agricultural Systems	4.0	Yes	T	Students will learn Systems approaches in Agriculture, Precision Agriculture and Information technology. Whole System Integration and Modeling. Climate change and Agriculture. Disaster management, Integrated Soil, Water and Nutrient Management.
89.	BOM958	Industrial Microbiology	4.0	Yes	T	Microbes and fermented foods in Industry. Micro-organism as a source of food. Fermentation ;Microbial process and products Antibiotics and Amino acids; Microbes in Agriculture will be discussed in details
90.	RDC 191	Rural Development	1.0	NO	P	It is a core course .This course will provide an introduction to the theory and practice of rural development. Students will learn the concept and Importance ; structure and problems of Rural Development. This course will provide knowledge about various rural development programs initiated by National and State Governments. Students will learn to developing questionnaire and schedule for Socio-economic survey of a rural area. Students will get practical knowledge about Socio-economic status of a village by surveying a village Students will get practical knowledge about block training centre/Agriculture farm/ Dairy farm by studying them.
91.	RDC 291	Agriculture operations	1.0	NO	P	It is a core course .This course will provide an introduction

						to the basic and fundamental knowledge about agriculture to students and help them to appreciate the dignity of labour and will encourage the students to learn by doing. This course will help in the development of six 'H's in the personality traits of the students i.e. better **Head**, better **Hand**, better **Heart**, better **Health**, better **Home**, and feeling of **Humility**. This course will develop love for plants among students which can be used in development kitchen gardens and for beautification of fields, offices, homes etc.