Estd. 1958

॥ Be One with the downtrodden and the underprivileged ॥

Shri Shivaji Education Society Karad, Board For Higher Education's

YASHWANTRAO CHAVAN COLLEGE OF SCIENCE, KARAD

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Reacredited B++ Level by NAAC, Bangalore

AN ISO 9001-2008 CERTIFIED COLLEGE REG. NO. : RQ91/5237

Department of Botany

PROGRAMME OUTCOMES (PO),

PROGRAMME SPECIFIC OUTCOMES (PSO)

&

COURSE OUTCOMES (CO)

Yashwantrao Chavan College of Science ★ Karad ★ BOTANY

Yashwantrao Chavan College of Science, Karad
Department of Botany

PROGRAM OUTCOMES (PO): M. Sc. (Botany)

After successful completion of two-year degree program in science students will be able to;

PO 1 Get high-quality, up-to-date information in the specific fields of Botany.

PO 2 Learn how to handle a variety of plants and associated issues practically.

PO 3 Learn both traditional and contemporary taxonomy techniques, identify plants.

PO 4 Develop business abilities in the context of advanced botany fields.

PO 5 Provide diverse computational abilities utilized in the realm of Bioinformatics.

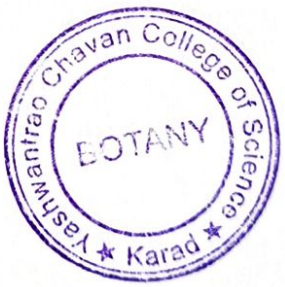
PO 6 Learn about the gene, molecular, cellular, and tissue levels of plant organization.

PO 7 Create and execute biological projects and experiments, analyze data, and offer insightful conclusions and suggestions.

PO 8 Solve problems related to food shortage.

PO 9 Make use of bioresources without seeking financial gain.

PO10 Become sufficiently proficient in a range of technical and analytical plant science abilities.



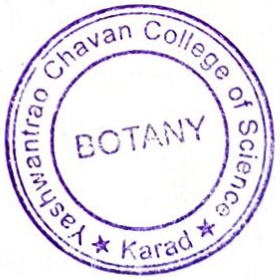
Yashwantrao Chavan College of Science, Karad

Department of Botany

PROGRAM SPECIFIC OUTCOMES (PSO): M.Sc. (BOTANY)

After successful completion of two-year degree program in science students will be able to:

PSO 1	Make use of the fundamental concepts that underlie the study of botany, its numerous subfields, and its links to related academic subjects and disciplines.
PSO 2	Create concepts, write scientific papers, verify findings, and provide clear explanations of concepts.
PSO 3	Plan the experiment and evaluate the data for conclusions by combining knowledge of the fundamental and practical aspects of botany.
PSO 4	Utilize the knowledge of Botany for the local and global issues of environment and its sustainable development.



Yashwantrao Chavan College of Science, Karad
Department of Botany
COURSE OUTCOMES

After the completion of the course, the student will be able to:

	SEM I
M Sc I	**Paper I Biology and Diversity of Algae, Fungi and Bryophytes** • Learn basic concepts of evolutionary biology of algae with reference to origin, thallus organization, occurance and distribution. • Acquire the basic concepts of origin, evolutionary biology and taxonomy of fungi. • Learn basic concepts and phylogeny of bryophytes. • Explain the economic, ecological and industrial role of algae, fungi and bryophytes.
M Sc I	**Paper II Biology and Diversity of Pteridophytes, and Gymnosperms: Extant & Extinct** • Learn morphology, anatomy and reproduction of pteridophytes. • Learn morphology, anatomy and reproduction of gymnosperms. • Explain morphology, anatomy evolutionary trends in pteridophytes and gymnosperms. • Acquire knowledge of geological time scale and fossil types.
M Sc I	**Paper III Tools and techniques** • Learn basic concepts of SI system, microscopy and biostatistics, • Explore several biophysical techniques such as sepration techniques, electrophoresis and chromatography. • Explore the basic concepts of spectroscopic and radioisotope techniques. • Acquire knowledge of principles of culture technique.
M Sc I	**Paper IV Biodiversity: Conservation and Utilization** • Learn importance of biodiversity and endemism. • Learn principles of biodiversity conservation and activities of govt. and nongovernment organizations. • Acquire concepts of *In-situ* and *Ex-situ* conservation. • Explore wild plant resources and utilization.
M Sc I Practical I	**Biology and Diversity of Algae, Fungi and Bryophytes** • Acquire skill of Identification and culture techniques in algae • Study different algal classes • Study fungi of different orders. • Study morphology, anatomy and reproduction in some bryophytes.
M Sc I Practical II	**Biology and Diversity of Pteridophytes and Gymnosperms (Extant & Extinct)** • Study morphology, anatomy and reproduction in some pteridophytes • Study morphology, anatomy and reproduction in some gymnosperms • Study characters of some fossil species

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M Sc I Practical III	**Tools and techniques** • Acquire skill of analytical experiment like preparation of standard solutions, ANOVA, Correlation coefficient, separation techniques. • Learn working of instruments, centrifugation technique, protein separation, micrometry.
M Sc I Practical IV	**Biodiversity: Conservation and Utilization** • Study wild, endemic, ornamental and endemic plants. • Learn to prepare plant products, phytoremediation by plants, preparation of many commercial products like jams and jellies, pickles, sarbat.
	SEM II
M Sc I	**Paper V Angiosperm Systematics** • Understand principles of taxonomy, taxonomic tools and ICN • Learn evolution concept, plant speciation and reproductive isolating mechanisms. • Learn Principles of taxometric, cladistics and systems of angiosperms classification. Acquire knowledge of angiosperm families as per APG IV system.
M Sc I	**Paper VI Plant Pathology** • Learn history, symptomology, epidemiology of plant diseases. • Learn characteristics of Virus and MLO diseases • Study symptomology, casual organism and management of fungal and bacterial diseases. Study symptomology, casual organism and management of fungal and bacterial diseases.
M Sc I	**Paper VII Cell and Molecular Biology** • Learn structure of cell, plasma membrane and plasmodesmata • Study cell shape, cell division, cell cycle and concept of gene. • Understand the cell signaling. Learn general principles of cell communication.
M Sc I	**Paper VIII Plant Structure, Development and Reproduction** • Learn gametophytes in angiosperms. • Understand fertilization and post fertilization events. • Understand morphogenesis and organogenesis in plants • Learn basics of palynological studies.
M Sc I Practical V	**Angiosperm Systematics** • Study of general and diagnostic characters of some families as per APG-IV • Study of general and diagnostic characters of some families as per APG-IV • Learn identification and preparation of dichotomous keys

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M Sc I Practical VI	**Plant Pathology** • Learn to identify important fungal diseases • Learn to identify bacterial, viral, phanerogamic and nematode diseases.
M Sc I Practical VII	**Cell and Molecular Biology** • Understand fluorescence and Feulgen staining, electron micrograph of cell organelles, plasmodesmatal connections in plant cells. • Learn determination cell permeability, stages in cycle. • Learn isolation and estimation of DNA and protein.
M Sc I Practical VIII	**Plant Structure, Development and Reproduction** • Understand anatomical peculiarities like shoot apices, stomata, trichomes. • Study ultrastructure of male and female gametophytes. • Learn about palynological peculiarities like pollen morphotypes, pollen germination, pollen fertility.
	Semester III
M Sc II	**Cytogenetics and Crop Improvement** • Learn chromosome structure and packaging of DNA, Karyotype analysis and Banding pattern • Study genetics of prokaryotes and Eukaryotes, crop genetic resources. • Understand Population and evolutionary genetics • Learn Methods of crop breeding and improvement.
M Sc II Practical	**CYTOGENETICS AND CROP IMPROVEMENT PAPER IX: PRACTICAL COURSE (CCPR 305.1)** • Learn to determine mitotic index, karyotype analysis and orcein banding. • Study technique of meiosis. • Solve genetic problems on gene mapping
M Sc II	**Paper X Biotechnology and Genetic Engineering** • Learn cDNA libraries, BAC, YAC, Crisper cas9 • Study methods DNA sequencing and analysis for gene expression • Understand concept, principle and applications of recombinant DNA technology • Learn concepts of genomics, proteomics, IPR and IPP
M Sc II Practical	**BIOTECHNOLOGY AND GENETIC ENGINEERING PAPER X: PRACTICAL COURSE** • Understand apomixis, chromosome hybridization case studies, *Drosophila* genetics. • Acquire skill of smear preparation, meiosis in structural hybrids and B chromosome. • Study life cycle in *Drosophila*, bacterial conjugation, transduction, transformation.

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M Sc II	**Paper XI (SPECIAL PAPER- I) CYTOGENETICS** • Study mitotic and meiotic cell division, chromosome disjunction, theories of crossing over. • Understand structural and numerical variations in chromosomes • Learn meiotic analysis in hybrids and alien genetic sources in crop improvement. • Study apomixis, chromosome hybridization case studies, Drosophila genetics.
M Sc II Practical	**CYTOGENETICS AND PLANT BREEDING PAPER XI: PRACTICAL COURSE I** • Acquire skill of smear preparation, meiotic analysis in structural hybrids. • Learn B chromosome in Maize/*Drimia*, Cytological analysis in polyploidy • Study life cycle and chromosome in *Drosophila.* • Study bacterial conjugation, transduction, transformation.
M Sc II	**Paper XII (SPECIAL PAPER II) PLANT BREEDING** • Acquire knowledge of plant breeding, domestication, germplasm and mechanism of pollination control. • Study inheritance of qualitative and quantitative characters, variability, heritability. • Learn correlation coefficient analysis, breeding procedures, cultivar development. • Study breeding for biotic and abiotic stress.
M Sc II	**Paper XIII Plant Physiology and Metabolism** • Study active and massive mechanism of solute transport. • Acquire knowledge of photosynthesis and respiration process. • Understand nitrogen metabolism and secondary metabolites in plants. • Learn plant hormones and stress physiology.
M Sc II Practical	**Plant Physiology and Metabolism** • Determine lipid peroxidation and rate of respiration • Estimate free amino acids, enzyme phenyl Alannine Ammonia Lyase and proline. • Study enzyme nitrate reductase and effects of PGR's on seed germination. • Learn to measure RWC in plants under stress.
M Sc II	**Paper XIV Biodiversity: Conservation and Utilization** • Learn importance of biodiversity and endemism. • Learn principles of biodiversity conservation and activities of govt. and nongovernment organizations. • Acquire concepts of *In-situ* and *Ex-situ* conservation. Explore wild plant resources and utilization.

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M Sc II Practical	**PLANT BIODIVERSITY AND CONSERVATION PAPER XIV** • Study wild, endemic, ornamental and endemic plants. • Learn to prepare plant products, phytoremediation by plants, preparation of many commercial products like jams and jellies, pickles, sarbat. • Understand importance of energy plants.
M Sc II	**Paper XV (Special Paper III) Molecular Genetics** • Explain microbial genetics and genetic exchange in bacteria. • Understand genetics of viruses and mapping of bacteriophage genome. • Acquire knowledge of PCR and DNA sequencing. • Update knowledge in bioinformatics, genomics and proteomics.
M Sc II Practical	**CYTOGENETICS AND PLANT BREEDING PAPER XV** • Acquire skill of In silico studies and preparation of linkage map • Explain QTL, EST, phylogenetics analysis. • Learn skill of hairy root culture, anther culture and haploid production. • Estimate protease inhibitors from plants.
M Sc II	**Paper XVI (Special Paper IV) Special Approaches in Genetic improvements of Crop plants.** • Discuss functional genomics and transcriptomics. • Learn methods of QTL analysis, mapping population, bulk segregation, epigenetics and epigenomics. • Acquire knowledge of tissue culture and production of secondary metabolites. • Understand transgenics methods of gene transfer in crops plants.
M Sc II Practical	**CYTOGENETICS AND PLANT BREEDING PAPER XVI** • Prepare project report based on practical knowledge gained from special theory and practical papers.

Yashwantrao Chavan College of Science ★ Karad ★ BOTANY

Head
Department of Botany
Yashwantrao Chavan College of Science, Karad

Principal
Yashwantrao Chavan College of Science, Karad