

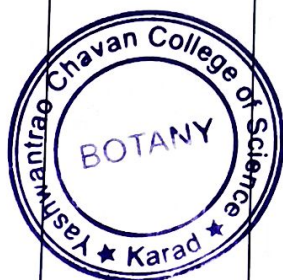
# Yashwantrao Chavan College of Science, Karad

## Department of Botany

### COURSE OUTCOMES

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

|                        | SEM I  |
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| M Sc I                 | <b>MMT – 101: BIOLOGY AND DIVERSITY OF ALGAE, FUNGI AND BRYOPHYTES</b> <ul style="list-style-type: none"><li>• Learn basic concepts of evolutionary biology of algae with reference to origin, thallus organization, occurrence and distribution.</li><li>• Acquire the basic concepts of origin, evolutionary biology and taxonomy of fungi.</li><li>• Learn basic concepts and phylogeny of bryophytes.</li><li>• Explain the economic, ecological and industrial role of algae, fungi and bryophytes.</li></ul> |
| M Sc I                 | <b>MMT – 102: BIOLOGY AND DIVERSITY OF PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY</b> <ul style="list-style-type: none"><li>• Learn morphology, anatomy and reproduction of pteridophytes.</li><li>• Learn morphology, anatomy and reproduction of gymnosperms.</li><li>• Explain morphology, anatomy evolutionary trends in pteridophytes and gymnosperms.</li><li>• Acquire knowledge of geological time scale and fossil types.</li></ul>  |
| M Sc I                 | <b>MMT – 103: TOOLS AND TECHNIQUES</b> <ul style="list-style-type: none"><li>• Learn basic concepts of SI system, microscopy and biostatistics,</li><li>• Explore several biophysical techniques such as separation techniques, electrophoresis and chromatography.</li><li>• Explore the basic concepts of spectroscopic and radioisotope techniques.</li><li>• Acquire knowledge of principles of culture technique.</li></ul>   |
| M Sc I<br>Practical I  | <b>MMPR – 104: PRACTICAL – I</b> <ul style="list-style-type: none"><li>• Acquire skill of Identification and culture techniques in algae</li><li>• Study different algal classes</li><li>• Study fungi of different orders.</li><li>• Study morphology, anatomy and reproduction in some bryophytes.</li></ul>   |
| M Sc I<br>Practical II | <b>MMPR – 105: PRACTICAL – II</b> <ul style="list-style-type: none"><li>• Study morphology, anatomy and reproduction in some pteridophytes</li><li>• Study morphology, anatomy and reproduction in some gymnosperms</li><li>• Study characters of some fossil species</li></ul>  |
| M Sc I                 | <b>MET – 106.2: CYTOGENETICS</b> <ul style="list-style-type: none"><li>• Study mitotic and meiotic cell division, chromosome disjunction, theories of crossing over.</li><li>• Understand structural and numerical variations in chromosomes</li><li>• Learn meiotic analysis in hybrids and alien genetic sources in crop improvement.</li><li>• Study apomixis, chromosome hybridization case studies, Drosophila genetics.</li></ul>  |



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| M Sc I | <p><b>MEPR – 107.2: CYTOGENETICS</b></p> <ul style="list-style-type: none"> <li>• Acquire skill of smear preparation, meiotic analysis in structural hybrids.</li> <li>• Learn B chromosome in Maize/<i>Drimia</i>, Cytological analysis in polyploidy</li> <li>• Study life cycle and chromosome in <i>Drosophila</i>.</li> <li>• Study of chromosomal banding and aberration</li> </ul>  |
| M Sc I | <p><b>RM – 108: RESEARCH METHODOLOGY IN BOTANY</b></p> <ul style="list-style-type: none"> <li>• Understand research, Experimental design and fundamentals of research</li> <li>• Acquire knowledge of methods of data collection, central tendency and ANOVA</li> <li>• Learn steps of research, report preparation, presentation and ethics</li> <li>• Understand biological database, softwares and journal metrics.</li> </ul>  |
|        | <b>SEM II</b>  |
| M Sc I | <p><b>MMT – 201: ANGIOSPERM SYSTEMATICS</b></p> <ul style="list-style-type: none"> <li>• Understand principles of taxonomy, taxonomic tools and ICN</li> <li>• Learn evolution concept, plant speciation and reproductive isolating mechanisms.</li> <li>• Learn Principles of taxometric, cladistics and systems of angiosperms classification.</li> </ul> <p>Acquire knowledge of angiosperm families as per APG IV system.</p>  |
| M Sc I | <p><b>MMT – 202: CELL AND MOLECULAR BIOLOGY</b></p> <ul style="list-style-type: none"> <li>• Learn structure of cell, plasma membrane and plasmodesmata</li> <li>• Study cell shape, cell division, cell cycle and concept of gene.</li> <li>• Understand the cell signaling.</li> </ul> <p>Learn general principles of cell communication.</p>  |
| M Sc I | <p><b>MMT – 203: STRUCTURE, DEVELOPMENT AND REPRODUCTION OF PLANTS</b></p> <ul style="list-style-type: none"> <li>• Learn gametophytes in angiosperms.</li> <li>• Understand fertilization and post fertilization events.</li> <li>• Understand morphogenesis and organogenesis in plants</li> </ul> <p>Learn basics of palynological studies.</p>   |
| M Sc I | <p><b>MMPR – 204: PRACTICAL – III</b></p> <ul style="list-style-type: none"> <li>• Study of general and diagnostic characters of some families as per APG-IV</li> <li>• Study of general and diagnostic characters of some families as per APG-IV</li> <li>• Learn identification and preparation of dichotomous keys</li> </ul> <p>Study types of stomata, trichomes and pollen morphotypes.</p>  |
| M Sc I | <p><b>MMPR – 205: PRACTICAL – IV</b></p> <ul style="list-style-type: none"> <li>• Understand fluorescence and Feulgen staining, electron micrograph of cell organelles, plasmodesmatal connections in plant cells.</li> <li>• Learn determination cell permeability, stages in cycle.</li> <li>• Learn isolation and estimation of DNA and protein.</li> <li>• Learn different enzyme activities.</li> </ul> <p>Study pollen viability, living shoot apices, male and female gametophytes.</p> |
| M Sc I | <p><b>MET – 206.2: PLANT BREEDING</b></p> <ul style="list-style-type: none"> <li>• Acquire knowledge of plant breeding, domestication, germplasm and mechanism of pollination control.</li> <li>• Study inheritance of qualitative and quantitative characters, variability, heritability.</li> </ul>  |



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|                | <ul style="list-style-type: none"> <li>Learn correlation coefficient analysis, breeding procedures, cultivar development.</li> </ul> <p>Study breeding for biotic and abiotic stress.</p>   |
| <b>M Sc I</b>  | <p><b>MEPR – 207.2: PLANT BREEDING</b></p> <ul style="list-style-type: none"> <li>Study floral biology, pollen germination.</li> <li>Analyse Mrtroglif and D2.</li> <li>Learn to design field experiments</li> </ul> <p>Determine Seed germination and Seed viability</p>   |
| <b>M Sc I</b>  | <b>OJT/FP – 208: ON JOB TRAINING (OJT)/ FIELD PROJECTS</b>  |
|                | <b>Semester III</b>   |
| <b>M Sc II</b> | <p><b>MMT – 301: CYTOGENETICS AND CROP IMPROVEMENT</b></p> <ul style="list-style-type: none"> <li>Learn chromosome structure and packaging of DNA, Karyotype analysis and Banding pattern</li> <li>Study genetics of prokaryotes and Eukaryotes, crop genetic resources.</li> <li>Understand Population and evolutionary genetics</li> </ul> <p>Learn Methods of crop breeding and improvement.</p> |
| <b>M Sc II</b> | <p><b>MMT – 302: BIOTECHNOLOGY AND GENETIC ENGINEERING</b></p> <ul style="list-style-type: none"> <li>Learn cDNA libraries, BAC, YAC, Crisper cas9</li> <li>Study methods DNA sequencing and analysis for gene expression</li> <li>Understand concept, principle and applications of recombinant DNA technology.</li> </ul> <p>Learn concepts of genomics, proteomics, IPR and IPP.</p>             |
| <b>M Sc II</b> | <p><b>MMT – 303: PLANT ECOLOGY AND EVOLUTION</b></p> <ul style="list-style-type: none"> <li>Understand origin of cells and unicellular evolution</li> <li>Learn ecological succession process</li> <li>Study Population ecology and concept of metapopulation</li> </ul> <p>Learn terrestrial and aquatic biome types.</p>  |
| <b>M Sc II</b> | <p><b>MMPR – 304: PRACTICAL – V</b></p> <ul style="list-style-type: none"> <li>Learn to determine mitotic index, karyotype analysis and orcein banding.</li> <li>Study technique of meiosis.</li> <li>Solve genetic problems on gene mapping</li> </ul> <p>Study phytoplankton and species diversity indices</p>  |
| <b>M Sc II</b> | <p><b>MMPR – 305: PRACTICAL – VI</b></p> <ul style="list-style-type: none"> <li>Acquire skill of MS medium preparation, callus culture and micropropagation.</li> <li>Learn cell suspension culture and estimation of secondary metabolites.</li> <li>Understand nucleotide sequence blast technique.</li> </ul> <p>Learn cell suspension culture.</p>  |
| <b>M Sc II</b> | <b>RP – 308: RESEARCH PROJECT</b>   |
|                | <b>M. SC. PART – II (SEMESTER – IV)</b>   |
| <b>M Sc II</b> | <p><b>MET – 405.2: SPECIAL APPROACHES IN GENETIC IMPROVEMENT OF CROP PLANTS</b></p> <ul style="list-style-type: none"> <li>Learn functional genomics and applications</li> <li>Understand transcriptomics and quantitative trait loci</li> </ul>  |

