

शासकीय कमलाराजा कन्या स्नातकोत्तर स्वशासी महाविद्यालय ग्वालियर (म.प्र.)
स्नातकोत्तर स्तर पर सेमेस्टर पद्धति के अन्तर्गत वनस्पतिशास्त्र विषय के
अध्ययन मण्डल द्वारा अनुशंसित तथा अकादमिक परिषद द्वारा अनुमोदित

Syllabus for P.G. Classes of Botany Under Semester System as recommended
by Board of Studies and approved by the Academic council of the college.
Effective from Session 2019-2020
M.Sc. Botany – III sem

BOT 301 : ANGIOSPERM , MORPHOLOGY AND TAXONOMY

UNIT I

General concept of morphology, origin and evolution of flower. Co-evolution of
flower vis a vis pollinators.

Origin and evolution of polypetaly, sympetaly, apetaly : monocy, diocy. Monocot
flower.

UNIT II

Stamens origin and evolution from foliar to reduced condition, extension of
connective beyond anthers : monodi and poladelphly : nectaries and nectar.
Carpels evolution, conduplicate, involute and other types. Validity of the concept
of foliar origin of carpel alternative concepts and approaches: specialized carpels :
poly and syncarpy : superior, semi- inferior and inferior ovary: appendicular and
receptaclar concepts: evolution of types of placenations.

UNIT III

Role of floral anatomy in interpreting the origin and evolution of a flower and
floral parts. Floral anatomy and taxonomy.
Experimental study on flower.

UNIT IV

Botanical exploration – historical perspective , brief account of botanical
exploration in south east Asia with special reference to India. Botanical survey of
India. Its organization and role.
Principles of plant classification with emphasis on modern tools of taxonomy :
molecular systematics. Utility of taxonomy : biosystematics.
Phylogenetic systems of classification : Cronquist .Takhataian AGP III

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UNIT V

Botanical nomenclature, ICNB, principles, articles, recommendation and amendments of code.

Familiarity with botanical literature, monographs, icons and floras, important periodicals with emphasis on Indian floristics methods of literature consultation.

Threat assessment, different categories of threat. IUCN, Red Data Book.

Important threatened plants of India.

PRACTICALS 301

1. Preparation of cleared whole mounts of floral parts of polypetalae, sympetalae and monocots for vasculature.
2. With the help hand section and dissection prepare longitudinal and transverse sections of flower. Examination of :
 - a. Transmitting tissue/ canal in stigma and style
 - b. Various types of ovaries and placentations
 - c. Special types of flowers with emphasis on vasculature of androecium and gynoecium.
3. Preparation of models (plasticine/thermocool) of vascular skeleton of flower and placentation.
4. Any other laboratory work based on theory syllabus.
5. Description of specimen.
6. Description of species based on various specimens, collective exercise
7. Description of various species of a genus.
8. Location of key characters, use of keys at generic levels, after the description a collective exercise.
9. Location of key characters, use of keys at family levels.
10. Identification of diagnostic characters and use of key (provided) at level of various families after the description have been made.
11. Preparation of key (using specimens from three four species)

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BOT 302 : CYTOLOGY AND MOLECULAR BIOLOGY OF PLANTS

UNIT I

The plant cell: structure, organization , cell cycle mechanism and its molecular basis , cytokinesis.

Nuclear : Structure, nucleolus organization.

Generalized structure of plant cell organelles.

UNIT II

Chromosome : Structure, molecular basis of chromosome structure. Eukaryotic genome, organization, Prokaryotic genome organization, variations in chromosome and its significance.

UNIT III

DNA packaging of DNA, nucleosome, nuclear membranes. C.-value paradox, cot curves , chemical structure , genetic code.

DNA replication in prokaryotes and eukaryotes.

Transcription , RNA splicing

Translation : Prokaryotic and Eukaryotic gene regulation (Operon concept).

UNIT IV

Meiosis origin and molecular events during meiosis.

Mitosis origin and molecular events during mitosis.

Chromosomal aberrations : Heteroploidy, structural changes in chromosomes.

UNIT V

Transposable elements and its molecular basis.

Membrane structure and function , ATPase sites.

Membrane transport with reference to transport protein.

Signal transduction on overview.

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BOT 303 : BIOMETRY , BIOINFORMATICS AND INSTRUMENTATION

UNIT I

Measurement of central tendency : mean , median , mode and standard deviation.
Chi square test.
Analysis of variance (ANOVA)
Application of probability distribution : binomial and normal.

UNIT II

Test of significance.
Correlation and regression
Growth curve : exponential and logarithmic.
Principle of experimental design : randomization , Replication and local control.

UNIT III

A general idea of chromatographic techniques theories and applications
High performance liquid chromatography (HPLC) basic study.
Electrophoresis techniques and applications : basic study.
Centrifugation : general theory instrumentation and application.

UNIT IV

Microscopy : Light and electron microscopy
Spectrophotometry : a general study of instrumentation and application of
colorimetry.
UV – visible Spectrophotometry NMR and ESR Spectrophotometry, Polarimetry.

UNIT V

Brief overview of information technology and science. Computerized database
and DBMS.
Introduction of bioinformatics and sequence analysis.
BLAST and FASTA
Data types and database in molecular biology
Sequence databases and sequence alignment
All computer graphic and information retrieval

PRACTICALS:

Practicals related to theory topics will be conducted.

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**BOT 304 : ECOLOGY – II SYNECOLOGY, ECOSYSTEMATOLOGY &
PHYTOGEOGRAPHY**

UNIT I

Concept and characteristics of plant community
Methods of studying vegetation
Raunkiers Life Forms
Biological spectrum
Seasonal aspect of vegetation

UNIT II

Plant succession .
Concept of climax and climax communities
Energy flow.
Trophic dynamics aspect of ecology
Food chain, food web, pyramid of number, biomass and energy.

UNIT III

System transfer function
Agroecosystem.
Biogeochemical cycles.
Forest ecosystem.
Rangeland management.

UNIT IV

Vegetation types of India
Floristics regions of India.
Production and productivity of various ecosystems.

UNIT V

Phytogeography as a border line science.
Principles of interpretation Phytogeograph
Age and Area Hypothesis.
Discontinuous distribution , endemics and

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Satpura hypothesis.
Gates of angiospermy.

PRACTICALS 304 :

1. Determination of minimum size of quadrat by species area curve method.
2. Determination of minimum number of quadrat by species area curve method.
3. Determination of frequency of various species by quadrat method and preparation of frequency diagram.
4. Determination of density of quadrat method.
5. Determination of abundance of species by quadrat method.
6. Determination of relative frequency by quadrat method.
7. Determination of relative density by quadrat method.
8. Determination of basal area by quadrat method.
9. Determination of relative dominance by quadrat method.
10. Determination of IVI by quadrat method.
11. Determination of community coefficient of two sites by quadrat method.
12. Preparation of biological spectrum of a locality.

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Sena