

# UNIVERSITY OF JAMMU

(NAAC ACCREDITED 'A' GRADE' UNIVERSITY)  
(Baba Sahib Ambedkar Road, Jammu-180006 (J&K))

Academic Section

Email: [academicsectionju14@gmail.com](mailto:academicsectionju14@gmail.com)

## NOTIFICATION (24/August /Adp/70)

In partial modification of this office Notification No. F.Acd/II/24/13698-13739 dated 01.02.2024, it is hereby notified for the information of all concerned that the Vice-Chancellor, in anticipation of the approval of the Academic Council, is pleased to authorize the adoption of the modification in the Syllabus of **Major Course of semester VI, titled "Genetics and Cytogenetics, Course Code UMJBOT601 and Major Course titled "Ethnobotany and Traditional Knowledge", Course Code UMJBOT704 and Minor Course Titled "Ethnobotany", Course Code UMIBOT705 of Semester VII of the Subject of Botany as per Four Year Undergraduate Programme (as given in annexure) for the examinations to be held in the years May 2025, 2026 and 2027 and December 2025, 2026 and 2027.**

The Syllabi of the courses is also available on the University website: [www.jammuuniversity.ac.in](http://www.jammuuniversity.ac.in)

Sd/-  
DEAN ACADEMIC AFFAIRS

No. F. Acd/II/24/ 9691-9720

Dated: 31/8/24

### Copy for information and necessary action to:

1. Dean, Faculty of Science
2. HOD/Convener, Board of Studies in Botany
3. Sr. P.A.to the Controller of Examinations
4. All members of the Board of Studies
5. Confidential Assistant to the Controller of Examinations
6. I/C Director, Computer Centre, University of Jammu
7. Deputy Registrar/Asst. Registrar (Conf. /Exam. UG)
8. Incharge, University Website for Uploading of the notification

Sunila sharma  
Deputy Registrar (Academic)  
03/09/2024  
85  
2/9/24  
2/9/24

**UNIVERSITY OF JAMMU**  
**Syllabus for FYUG Program in BOTANY**  
**(Under CBCS as per NEP-2020)**  
**UG SEMESTER-VI**  
**(Syllabus for the examinations to be held in May 2025, 2026, 2027)**

**GENETICS AND CYTOGENETICS**  
**(MAJOR COURSE)**

	Credits	Contact Hours	Units	Max. Marks: 100 (Theory-75, Practical-25)			
				Examination			
				Duration	(hours)	Weightage	(Marks)
			Mid-semester	End-semester	Mid-semester	End-semester	
Theory	03	45	I to IV	1½	03	15	60
Practical	01	30	V	D.P.A	3½	10	15

D.P., A- Daily Performance and Attendance

*Objectives:*

*The course has been devised to acquaint the students with the structural and functional aspects of chromosomes and genes and alterations generally found in these.*

*Course Learning Outcomes:*

*The students will be able to prepare mitotic and meiotic slides of different species and differentiate between all stages. By understanding the concepts of transcription, translation and mutation, the students can design their experiments of molecular biology.*

**Unit-I: Mendelian and non-Mendelian inheritance**

- 1.1 Mendelism, laws of segregation and independent assortment; allelic and non-allelic interactions.
- 1.2 Linkage and recombination, role of linkage in mapping of genes.
- 1.3 Cytological techniques: classical (karyotypic and meiotic studies based on general staining) and modern (banding and in-situ hybridization).
- 1.4 Chromosomal theory of inheritance: details and evidence.

**Unit-II: Specialized chromosomes**

- 2.1 Lampbrush and Polytene chromosomes: Structure peculiarities and function.
- 2.2 B-chromosomes and Sex chromosomes: Structure and function.
- 2.3 Balanced theory of Sex-determination; Sex-linked inheritance.
- 2.4 Cytoplasmic inheritance; male sterility, Kappa particles.

*[Handwritten signature]*  
2028/24

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**GENETICS AND CYTOGENETICS**  
**(MAJOR COURSE)**

Course No. UMJBOT601

Max. Marks: 100 (Theory-75, Practical-25)

**Unit-III: Alterations of the genome.**

- 3.1 Structural alterations; types, effect and detection of intra-chromosomal alterations (deletions, duplications and inversions).
- 3.2 Mechanism, effect and detection of inter-chromosomal alterations (translocations).
- 3.3 Euploidy-types, origin and effect with suitable examples (wheat and cotton).
- 3.4 Aneuploidy-types, origin and effect with suitable examples.

**Unit-IV: Alterations in the basic unit of inheritance**

- 4.1 Mutations-types, sources (spontaneous and induced), uses and mechanisms of induction.
- 4.2 DNA damage and repair mechanisms: Types and brief account of excision repair and recombination repair systems.
- 4.3 Concept and salient features of transposable elements in prokaryotes (IS and Tn).
- 4.4 Concept and salient features of transposable elements in eukaryotes (Ac-Ds).

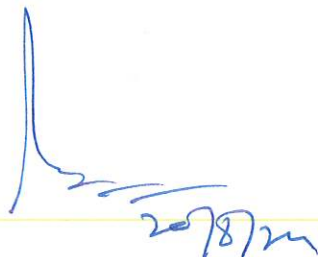
**UNIT-V: Practicals**

- 5.1 Examination of various stages of mitosis and meiosis using appropriate plant material (e.g. onion root tips, onion flower buds).
- 5.2 Preparation of karyotypes from dividing root tip cells and pollen grains.
- 5.3 Cytological examination of special types of chromosomes; lampbrush and polytene chromosomes.
- 5.4 Working out the laws of inheritance (monohybrid, dihybrid, gene interactions) using seed mixtures.
- 5.5 Working out the mode of inheritance of linked genes from test cross and/ or F<sub>2</sub> data.
- 5.6 Construction of chromosome maps using three - point test cross data.

Note for paper setters

**End Semester University Examination (Total Marks: 60; syllabus to be covered: 100%)**

The question paper will have 2 sections. Section 'I' will be compulsory having four questions of 3 marks each and spread over the entire theory syllabus (i.e. Unit I to IV; one from each unit). The questions will be short answer type having answers not exceeding 50 to 70 words. Section 'II' will have eight long answer type questions, two from each unit. Each question will be of 12 marks. The candidates will be required to answer one question from each unit.



20/8/24



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**GENETICS AND CYTOGENETICS**  
**(MAJOR COURSE)**

**Course No. UMJBOT601** **Max. Marks: 100 (Theory-75, Practical-25)**  
**Mid semester Assessment (Total Marks: 15; syllabus to be covered upto: 50%)**

Fifteen (15) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 7 marks and four short answer type questions of 2 marks each.

**Note for distribution of 25 Marks in Practical Examination (based on Unit V)**

**Practicals (Mandatory)**

Conduct of practicals is mandatory as per UGC guidelines. These can be undertaken in separate group of 15-20 students per group in addition to theory classes.

**Note for distribution of 25 Marks in Practical Examination (based on Unit V)**

<b>I. Internal Assessment (Total Marks: 10)</b>	<b>Marks</b>
Daily performance based on practical work done and attendance	10
<b>II. External Assessment (Total Marks: 15)</b>	
External practical examination and Viva-voce	15

**Suggested Readings:**

1. Albert B., Bray, D., Raff, M., Roberts, Kand Watson J. D. 2004. Molecular Biology of Cell. 3<sup>rd</sup> Edn. Garland Science. New York, USA.
2. Snustad, D. P. and Simmons, M. J. 2000. Principles of Genetics. John Wiley & sons, Inc. USA
3. Lodish, H., Berk, A., Zipursky, S.L., Matsudaria P., Baltimore, D and Darnell, J. 2000. Molecular Cell Biology. 5<sup>th</sup> Edn. W.H. Freeman & Co. New York, USA.
4. Atherly, A.G., Girton, J.R. and Mc. Donald, J.F. 1999. The Science of Genetics. Diane Publishing. Co. Fort Worth, USA.
5. Gupta, P K. 1999. A Text Book of Cell and Molecular Biology. Rastogi Publications, Meerut, India.
6. Russell, P J. 1998. Genetics. The Benjamin Cummings Publishing Co. Inc., USA.
7. Kleinsmith, L J. AndKish, V. M. 1995. Principles of Cell and Molecular Biology. 2<sup>nd</sup> Edn. Harper Collins College Publishers, New York, USA.
8. Wolfe, S. L. 1993. Molecular and Cell biology. Wadsworth Publishing Co. California, USA.

  
2024

UNIVERSITY OF JAMMU  
Syllabus for FYUG Program in BOTANY  
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UG SEMESTER-VII  
(Syllabus for the examinations to be held in December 2025, 2026, 2027)

ETHNOBOTANY AND TRADITIONAL KNOWLEDGE  
(MAJOR COURSE)

Course No. UMJBOT704

Max. Marks: 100 (Theory-75, Practical-25)

	Credits	Contact Hours	Units	Examination			
				Duration (hours)		Weightage (Marks)	
				Mid-semester	End semester	Mid-semester	End semester
Theory	03	45	I to IV	1½	03	15	60
Practical	01	30	V	D.P.A	3½	10	15

D.P.A- Daily Performance and Attendance.

*Objectives:*

*The course will provide an overview of the science of plant usage by people belonging to different cultures, tribes and societies. Role of these people in the biodiversity management and conservation of plant genetic resources; in alleviating pain and curing diseases will eventually culminate in the discovery of drugs.*

*Course Learning outcomes:*

*Upon completion, students will possess a comprehensive understanding of plant usage by diverse cultures. They will be able to appreciate the traditional methods in biodiversity conservation, and insights into the medicinal properties of plants fostering thereby an understanding of their potential in healthcare and pharmaceutical research.*

**Unit-I Ethnobotany and related issues**

- 1.1 Concept, scope and objectives of ethnobotany.
- 1.2 Ethnobotany as an interdisciplinary Science and its importance.
- 1.3 Life styles and livelihood options of major ethnic groups/ tribals of India with special reference to Jammu & Kashmir.
- 1.4 Major issues related to ethnobotany (Ethical, Cultural, Social, etc.).

  
20/9/2024

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**ETHNOBOTANY AND TRADITIONAL KNOWLEDGE**  
**(MAJOR COURSE)**

Course No. UMJBOT704

Max. Marks: 100 (Theory-75, Practical-25)

**Unit-II Methodology of Ethnobotanical studies**

- 2.1 Field work and collection of plant-based data, Herbarium preparation and identification of plants.
- 2.2 Sources of data and methods of study: Fossils, archaeological resources and ancient literature.
- 2.3 Validation of ethnobotanical data using various ethnobotanical indices.
- 2.4 Sacred grooves and ancient monuments as sources of data and plant conservation.

**Unit-III Role of Ethnobotany in modern medicine**

- 3.1 Ethnobotanical sources of medicinal importance in India: a general account.
- 3.2 Habitat, morphology and significance of (a) *Azadiracta indica* (b) *Ocimum tenuiflorum* (c) *Vitex negundo* (d) *Gloriosa superba* (e) *Tribulus terrestris* (f) *Pongamia pinnata* in ethnobotanical practices.
- 3.3 Role of ethnobotany in modern medicine with special reference to *Rauwolfia serpentina*, *Artemisia* and *Withania somnifera*.
- 3.4 ISM (Indian System of Medicine); Alternative and Complimentary medicine: Concept and scope.

**Unit-IV Legal aspects in Ethnobotany**

- 4.1 Concept of Rare, Endemic and Threatened (RET) taxa.
- 4.2 Role of International Union for Conservation of Nature (IUCN) and Botanical Survey of India (BSI) in conservation.
- 4.3 Biopiracy, Intellectual Property Rights and Traditional Knowledge.
- 4.4 Biodiversity laws in India; Peoples' Biodiversity Registers.

  
20/2/2025

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**UG SEMESTER-VII**  
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**ETHNOBOTANY AND TRADITIONAL KNOWLEDGE**  
**(MAJOR COURSE)**

Course No. UMJBOT704 Max. Marks: 100 (Theory-75, Practical-25)


**Unit-V Practicals**

- 5.1 Microscopy of plant parts (roots, stem and leaves) used as important drugs.
- 5.2 Powder analysis of compound drug formulations.
- 5.3 Preparation of herbarium sheets of succulent and non- succulent plant specimens.
- 5.4 Field survey of nearby local areas for studying existing plant biodiversity.
- 5.5 Demonstration for filling the PBR formats.
- 5.6 Recording of data for PBR (Assignments).
- 5.7 Documentation of traditional knowledge from local/ indigenous population.
- 5.8 Validation of Ethnobotanical data using relevant indices

**Note for paper setters**

**End Semester University Examination (Total Marks: 60; syllabus to be covered: 100%)**

The question paper will have 2 sections. Section 'I' will be compulsory having four questions of 3 marks each and spread over the entire theory syllabus (i.e. Unit I to IV; one from each unit). The questions will be short answer type having answers not exceeding 50 to 70 words. Section 'II' will have eight long answer type questions, two from each unit. Each question will be of 12 marks. The candidates will be required to answer one question from each unit.





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**UG SEMESTER-VII**

**(Syllabus for the examinations to be held in December 2025, 2026, 2027)**

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**ETHNOBOTANY AND TRADITIONAL KNOWLEDGE**  
**(MAJOR COURSE)**

Course No. UMJBOT704

Max. Marks: 100 (Theory-75, Practical-25)

**Mid Semester Assessment (Total Marks:15; syllabus to be covered upto: 50%)**

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**Practicals (Mandatory)**

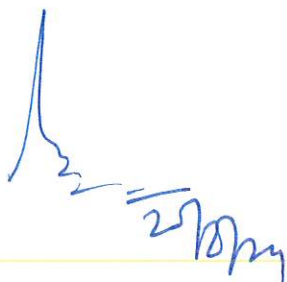
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	<b>Marks</b>
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7. Rama Rao, N and A.N. Henry (1996). The Ethnobotany of Eastern Ghats in Andhra Pradesh, India. Botanical Survey of India. Howrah.
8. Rajiv K. Sinha. (1996). Ethnobotany the Renaissance of Traditional Herbal Medicine- INASHREE Publishers, Jaipur-1996.





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**UG SEMESTER-VII**

(Syllabus for the examinations to be held in December 2025, 2026, 2027)

**ETHNOBOTANY**  
**(MINOR COURSE)**

Course No. UMIBOT705

Max. Marks: 100 (Theory-75, Practical-25)

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**ETHNOBOTANY**  
**(MINOR COURSE)**

Course No. UMIBOT705

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**ETHNOBOTANY**  
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**ETHNOBOTANY**  
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Course No. UMIBOT705

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