



UNIVERSITY OF JAMMU

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

Academic Section

Email: academicsectionju14@gmail.com

CORRIGENDUM

Subject	Semester	Course Code /Title	Existing Note for Paper Setting	To be modified for the examinations to be held in the year 2024, 2025 and 2026
Botany	Semester-V	UMJBOT-504 (Major Course) Title: Biostatistics)	<p>End semester University Examination (Total Marks:30; syllabus to be covered: 100%) The questions paper will have 2 section. Section-I will be compulsory having two question of 3 marks each and spread over the entire theory syllabus (i.e Units I & II; one from each unit) the questions not exceeding 50 to 70 words. Section-II will have four long answer type questions two from each unit. Each question will be of 12 marks. The candidates will be required of 2 marks each. Mid semester Assessment (Total Marks:10; syllabus to be covered upto : 50%) Ten (10) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 6 marks and two short answer type questions of 2 marks each. Practical's (Mandatory) Conduct of Practicals is mandatory as per UGC guidelines. These can be undertaken in separate groups of 15-20 students per group in addition to theory classes. Note for distribution of 10 marks in Practical Examination (based on Unit III) I. Internal Assessment (Total Marks:5) Daily performance based on practical work done and attendance 5 II. External Assessment (Total Marks:5) External practical examinations and Viva-voce 5</p>	<p>End semester University Examination (Total Marks:40; syllabus to be covered: 100%) The questions paper will have 2 section. Section-I will be compulsory having five question of 2 marks each and spread over the entire syllabus. The questions will be short answer type having answers not exceeding 50 words. Section-II will have six long answer type questions two from each unit. Each question will be of 10 marks. The candidates will be required to answer one question form each unit. Mid semester Assessment (Total Marks:10; syllabus to be covered upto : 33%) Ten (10) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 6 marks and two short answer type questions of 2 marks each. Conduct of practicals is mandatory as per UGC guidelines. These can be undertaken in separate groups of 15-20 students per group in addition to theory classes,</p>

As already notified vide notification No. F.Acd/II/24/13698-13739 dated 01.02.2024 in the Syllabi and Courses of Study in the subject of Botany Semester Vth Course no. UMJBOT504 for Four Year Under Graduate Programme as per NEP-2020 and Course no. UMIBOT605, Title- Cytogenetics of Semester-VI also be included in the syllabi. (as given in an appendix)

Sd/-
DEAN ACADEMIC AFFAIRS

No. F. Acd/II/23/12895-12919

Dated: 03-12-2024

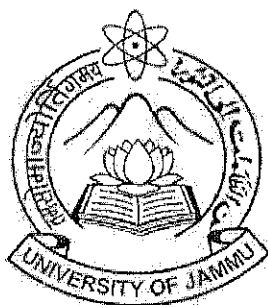
Copy for information and necessary action to:

1. HOD/Convener, Board of Studies in Botany
2. All members of the Board of Studies
3. C.A. to the Controller of Examinations
4. Director, Computer Centre, University of Jammu
5. Asst. Registrar (Conf./Exams. UG/Evaluation. Non. Prof.)
6. Incharge University Website for necessary action please.

Sumitashamo
3/12/2024
Joint Registrar (Academic)

9/12/24
6/12/24

DEPARTMENT OF BOTANY
UNIVERSITY OF JAMMU



CURRICULUM FRAMEWORK FOR
FOUR-YEAR UNDER GRADUATE (FYUG) PROGRAM IN BOTANY

UNDER CBCS

AS PER

National Education Policy-2020

WITH EFFECT FROM THE ACADEMIC YEAR 2024-25

Approved By:

Board of Studies in Botany

DEPARTMENT OF BOTANY, UNIVERSITY OF JAMMU, JAMMU

Following courses of study are prescribed for

5th to 8th semesters

FYUG program in the subject of BOTANY

under CBCS as per NEP-2020

SEMESTER	TYPE OF THE COURSE	TITLE OF THE COURSE	COURSE NO.	CREDITS (T-Teaching P-Practical)
FIFTH	MAJOR	PLANT PHYSIOLOGY	UMJBOT501	4 (3T+1P)
	MAJOR	PLANT BIOCHEMISTRY AND METABOLISM	UMJBOT502	4 (3T+1P)
	MAJOR	REPRODUCTION IN FLOWERING PLANTS	UMJBOT503	4 (3T+1P)
	MAJOR	BIOSTATISTICS	UMJBOT504	2 (1T+1P)
	MINOR	PLANT REPRODUCTION	UMIBOT505	4 (3T+1P)
	SKILL ENHANCEMENT	SUMMER INTERNSHIP	USEBOT506	2 (P)
SIXTH	MAJOR	GENETICS AND CYTOGENETICS	UMJBOT601	4 (3T+1P)
	MAJOR	PLANT BREEDING	UMJBOT602	4 (3T+1P)
	MAJOR	PLANT BIOTECHNOLOGY AND TISSUE CULTURE	UMJBOT603	4 (3T+1P)
	MAJOR	SYSTEMATICS AND EVOLUTIONARY BIOLOGY	UMJBOT604	4 (3T+1P)
	MINOR	CYTOGENETICS	UMIBOT605	4 (3T+1P)
SEVENTH	MAJOR	RESEARCH METHODOLOGY AND RESEARCH ETHICS	UMJBOT701	4 (3T+1P)
	MAJOR	APPLIED MICROBIOLOGY AND PLANT PATHOLOGY	UMJBOT702	4 (3T+1P)
	MAJOR	APPLIED BOTANY	UMJBOT703	4 (3T+1P)
	MAJOR	ETHNOBOTANY AND TRADITIONAL KNOWLEDGE	UMJBOT704	4 (3T+1P)
	MINOR	ETHNOBOTANY	UMIBOT705	4 (3T+1P)
EIGHTH (4YR UG HONOURS)	MAJOR	BIOLOGICAL TECHNIQUES AND INSTRUMENTATION	UMJBOT801	4 (3T+1P)
	MAJOR	LATEST DEVELOPMENTS IN PLANT AND MICROBIAL SCIENCES	UMJBOT802	4 (3T+1P)
	MAJOR	BIOINFORMATICS	UMJBOT803	4 (3T+1P)
	MAJOR	CONSERVATION AND SUSTAINABILITY	UMJBOT804	4 (3T+1P)
	MINOR	SUSTAINABLE CONSERVATION	UMIBOT805	4 (3T+1P)
EIGHTH (4YR UG HONOURS WITH RESEARCH)	MAJOR	CONSERVATION FOR SUSTAINABILITY	UMJBOT806	4 (3T+1P)
	MINOR	SUSTAINABLE CONSERVATION OF NATURE	UMIBOT807	4 (3T+1P)
	SKILL ENHANCEMENT	RESEARCH PROJECT/ DISSERTATION	USEBOT808	12 (P)

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UNIVERSITY OF JAMMU
Syllabus for FYUG Program in BOTANY
(Under CBCS as per NEP-2020)
UG SEMESTER-V
(Syllabus for the examinations to be held in December 2024, 2025, 2026)

BIOSTATISTICS
(MAJOR COURSE)

Course No. UMJBOT504

Max. Marks: 50 (External-40, Internal-10)

	Credits	Contact Hours	Units	Examination			
				Duration	(hours)	Weightage	(Marks)
				Mid-semester	End-semester	Mid-semester	End-semester
Theory & Practical	03	30	03	1	02½	10	40

Objectives:

The course is designed to educate the students about the collection and interpretation of data and sampling of biological problems and plotting them graphically. An introduction to probability distribution and correlation will help them to understand the relationship of one variable with the other.

Course Learning Outcomes:

Students will be able to understand and design biological experiments, analyze and interpret the data.

Unit-I: Basics of Biostatistics and Descriptive statistics

- 1.1 Conceptual understanding of statistics, statistical methods and basic principles.
- 1.2 Variables -measurements, functions, limitations and uses of statistics.
- 1.3 Measures of central tendency: mean, median and mode, merits and demerits.
- 1.4 Measures of dispersion: range, quartile deviation, mean deviation, standard deviation, standard error and coefficient of variation.

Unit-II: Relational Statistics

- 2.1 Introduction to probability distributions; concept of normal distribution.
- 2.2 Tests of significance: methods of computation and applications of chi square and t-tests.
- 2.3 Correlation: concept, types and methods.
- 2.4 Regression: application, similarities and dissimilarities with correlation.

Unit-III: Practicals

- 3.1 Tabulation of secondary data, and construction of histograms and frequency polygons
- 3.2 Calculation of mean, mode, median, standard deviation and coefficient of variation.
- 3.3 t-test and chi square test.
- 3.4 Correlation and regression analysis.

UNIVERSITY OF JAMMU
Syllabus for FYUG Program in BOTANY
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UG SEMESTER-V
(Syllabus for the examinations to be held in December 2024, 2025, 2026)

BIOSTATISTICS
(MAJOR COURSE)

Course No. UMJBOT504

Max. Marks: 50 (External-40, Internal-10)

Note for paper setters

End Semester University Examination (Total Marks: 40; syllabus to be covered: 100%)

The question paper will have 2 sections. Section 'I' will be compulsory having five questions of 2 marks each and spread over the entire syllabus. The questions will be short answer type having answers not exceeding 50 words. Section 'II' will have six long answer type questions, two from each unit. Each question will be of 10 marks. The candidates will be required to answer one question from each unit.

Mid semester Assessment (Total Marks: 10; syllabus to be covered: upto 33%)

Ten (10) marks for theory paper in a subject reserved for internal assessment shall have one long answer type question of 6 marks and two short answer type questions of 2 marks each. Conduct of practicals is mandatory as per UGC guidelines. These can be undertaken in separate groups of 15-20 students per group in addition to theory classes.

Suggested readings:

1. Khan and Khanum, (2018). Fundamentals of Biostatistics. 5th rev ed. Ukaaz Publications, Hyderabad.
2. Norman, G. R. and Streiner, D. L. (2008) Biostatistics-the Bare Essentials. B C Decker Inc., Hamilton, Canada.
3. Sokal, R. R. and Rohlf, F. J. (2001) Biometry-The Principles and Practice of Statistics in Biological Research. W. H. Freeman and Company, New York.
4. Senedecor, G. and Cochran, W. (1980) Statistical Methods. 7th Edn. Iowa State University Press.
5. Sokal, R. R. and Rohlf, F. J. (1973). An Introduction to Biostatistics. W. H. Freeman and Company, New York. 19.



UNIVERSITY OF JAMMU
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UG SEMESTER-VI
(Syllabus for the examinations to be held in May 2025, 2026, 2027)

CYTOGENETICS
(MINOR COURSE)

Course No. UMIBOT605				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 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.

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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)

CYTOGENETICS
(MINOR COURSE)

Course No. UMIBOT605

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 F₂ data.
- 5.6 Construction of chromosome maps using three - point test cross data.

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UG SEMESTER-VI
(Syllabus for the examinations to be held in May 2025, 2026, 2027)

CYTOGENETICS
(MINOR COURSE)

Course No. UMIBOT605
Note for paper setters

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

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.

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)

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

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UG SEMESTER-VI

(Syllabus for the examinations to be held in the years 2024, 2025, 2026)

CYTOGENETICS
(MINOR COURSE)

Course No. UMIBOT605

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

Suggested Readings:

1. Albert B., Bray, D., Raff, M., Roberts, Kand Watson J. D. (2004). Molecular Biology of Cell. 3rd 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. 5th 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. 2nd Edn. Harper Collins College Publishers, New York, USA.
8. Wolfe, S. L. (1993). Molecular and Cell biology. Wadsworth Publishing Co. California,USA.