



UNIVERSITY OF JAMMU

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

Academic Section

Email: academicsectionju14@gmail.com

NOTIFICATION

(23/May/Adp./37)

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 Syllabi and Courses of Study in the subject of **Mathematics** of Semesters **IIIrd** and **IVth** for **Four Year Under Graduate Programme** under the **Choice Based Credit System** as per **NEP-2020 (as given in the annexure)** for the examinations to be held in the years as per the details given below:

Subject	Semester	for the examination to be held in the years
Mathematics	Semester-III	December 2023, 2024 and 2025
	Semester-IV	May 2024, 2025 and 2026

The Syllabi of the courses is available on the University website:
www.jammuuniversity.ac.in

Sd/-
DEAN ACADEMIC AFFAIRS

No. F. Acd/II/23/3408-3418

Dated: 25-5-2023

Copy for information and necessary action to:

1. Dean, Faculty of Mathematical Science
2. Convener, Board of Studies in **Mathematics**
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. /Exams. UG/Eval Non-Prof)
8. Incharge, University Website for Uploading of the notification.

Sumitashamo
Deputy Registrar (Academic)

SS AOU 24/5/23

Semester – III

SEMESTER III (MATHEMATICS)

4 Credits Courses

S.No.	Course Type	Course No.	Course Title	Credits	Marks				Total Marks
					Theory:75		Tutorial:25		
					Mid Sem Exam	End Sem Exam	Assessment	Exam	
1.	Major	UMJMAT301	Real Analysis-I	4	15 marks	60 marks	10 marks	15 Marks	100
2.	Major	UMJMAT302	Partial Differential Equations	4					
3.	Minor	UMIMAT303	Real Analysis	4					

3 Credits Courses

S.No.	Course Type	Course No.	Course Title	Credits	Total Marks		Total marks
					Theory		
1.	MD	UMDMAT304	Foundations of Mathematics	3	Mid Semester: 15 marks	End Semester: 60 marks	75
2.	AE	UAEMAT306	Linear Programming	3			

2 Credits Courses

S.No.	Course Type	Course No.	Course Title	Credits	Total Marks		Total marks
					Theory	Practical	
1.	SE	USEMAT305	LATEX	2	Mid Semester: 10 marks End Semester: 20 marks	20 marks	50

[Signature]
15.05.2023

University of Jammu
Syllabus of Mathematics at FYUGP under CBCS
as per NEP-2020.

SEMESTER III
(Examination to be held in December 2023, 2024, 2025)
Major Course

Course Code: UMJMAT301
Course Title: Real Analysis-I
Credits: 04
Total Number of Lectures: Theory: 45, Tutorials: 15
Maximum Marks: 100, Theory: 75, Tutorial: 25

Objectives: The main objective of this course is the study of sequences and series of real numbers.

Prerequisite of this course: UMJMAT101 and UMJMAT201

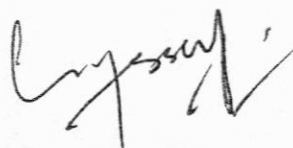
Structure of the Course: This course is divided into four units of 15 class lectures each, wherein one lecture is of one hour duration.

Unit-I

Finite and infinite sets. Intervals. Countable and uncountable sets, Absolute value and the Real line. Triangular Inequality, Bounded and unbounded sets, Supremum and infimum of sets, Least upper bound and greatest lower bound, \mathbb{R} as a complete ordered field, Existence of rationals and irrationals between reals. Examples and Exercises based on these topics-to be done as tutorials.

Unit-II

Definition of real sequences, Limit of a sequence, Convergence, boundedness and divergence of sequences, Oscillatory and monotone sequences, Uniqueness of a limit. Operations on convergent and divergent sequences. Monotone Convergence Theorem and its applications to the calculation of square root of positive numbers. Squeezing Principle. Examples and Exercises based on these topics-to be done as tutorials.



Unit-III

Subsequences and Bolzano-Weierstrass Theorem, Cauchy Sequences, Cauchy's General Principle of Convergence, Nested Interval Theorem, Contractive Sequences. Examples and Exercises based on these topics-to be done as tutorials.

Unit-IV

Infinite series and their convergence and divergence, Cauchy's Criterion for series, Conditional and absolute convergence, Geometric series test, p-series test, comparison tests, D'Alembert's ratio test, Cauchy's root test, Raabe's test, Gauss test (without proof). Examples and Exercises based on these topics-to be done as tutorials.

Text Books:

1. Robert G. Bartle and Donald R. Sherbert. *Introduction to Real Analysis*, Wiley India Edition, 2011.
2. Richard R. Goldberg. *Methods of Real Analysis*. Oxford and IBH Publishing Co. Pvt. Ltd, New Delhi.

Reference Books:

1. S.C. Malik and Savita Arora, *Mathematical Analysis*, New Age International Publisher, 1982 (2020 reprint).
2. Sudhir R. Ghorpade, Balmohan V. Limaye, *A Course in Calculus and Real Analysis*, Springer, 2018.
3. Walter Rudin, *Principles of Mathematical Analysis*, 3rd Edition, McGraw-Hill International Editions, 1976.
4. Tom M. Apostol. *Mathematical Analysis*, Narosa Publishing House, 1985.
5. Charles G. Denlinger, *Elements of Real Analysis*, Jones and Bartlett India Pvt. Ltd, 2011.
6. Houshang H. Sohrab, *Basic Real Analysis*, Birkhauser, 2003.
7. H. Protter, *Basic Elements of Real Analysis*, Springer, 1998.
8. Stevan G. Krantz, *Real Analysis and Foundations*, CRC Press, 2000.
9. William R. Parzynski and Philip W. Zipse, *Introduction to Mathematical Analysis*, McGraw-Hill International Editions, 1987.

Note to the College: Teaching and understanding of concepts of Mathematics being different from other disciplines requires problem solving sessions beyond regular class work. Therefore, extra three lectures per week need to be devoted to problem solving sessions as tutorials.

