Department of Mathematics
Faculty of Sciences, Jamia Millia Islamia

Skill Enhancement Course in Mathematics (2024-25)
Course Structure and Syllabus

Semester	Code	Title of the Paper	Credits
II	24MATS151	Set Theory and Number Theory	3

24MATS151	Set Theory and Number Theory
Unit-I	Cartesian products of sets, Equivalence relations, and partition, Fundamental Theorem of equivalence relation, Equivalent set, Countable and uncountable sets, Cantor's Theorem.
Unit-II	Cardinal numbers, Power of continuum, Cardinal arithmetic, Inequalities in cardinals, Schroeder-Bernstein Theorem, Partially and totally ordered sets.
Unit-III	Linear Diophantine equation, Prime counting function, Statement of prime number Theorem, Goldbach conjecture, Linear congruences, Complete set of residues, Properties of congruences, Chinese Remainder Theorem, Fermat's Little Theorem, Lagrange's Theorem, Wilson's Theorem.

Books Recommended

1. David M. Burton: Elementary Number Theory, 6th Ed., Tata McGraw‑Hill, Indian reprint, 2007.
2. Neville Robinns: Beginning Number Theory, 2nd Ed., Narosa Publishing House Pvt. Ltd., Delhi, 2007.
3. Seymour Lipschutz: Set Theory and related topics. McGraw-Hill Education; 2nd edition, 1998.
4. J. Hunter: Number Theory, Oliver & Boyd, Edinburgh and London,1964.

कुलसचिव कार्यालय   **Office of the Registrar**   दफ्तर مُسَجِّل

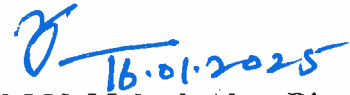C&O-4(121)/RO/2025   16th January, 2025

NOTIFICATION

It is hereby notified for information of all concerned that the University has approved the implementation of SWAYAM courses in the University as envisaged in the NEP-2020 w.e.f. the even semester of the current academic session i.e. 2024-25, initially for the students of 2nd Semester of all Under Graduate courses of the University. The students are required to mandatorily opt for one of the following courses available on the SWAYAM Portal on the link as given against each course:

i) **Environmental Studies**   (https://onlinecourses.swayam2.ac.in/cec25_es01/preview)
ii) **Indian Knowledge System** (https://onlinecourses.swayam2.ac.in/ntr25_ed18/preview)

It may be noted that the last date for registration for these course is 20th January, 2025 All the Deans of the Faculties/Heads of the Depts/Directors of the Centres are requested to ensure that the students get themselves registered for these courses latest by **20.01.2025**.

16.01.2025

(Prof. Md. Mahtab Alam Rizvi)
Registrar

Copy to:

1. All Deans of Faculties/DSW/HoDs/Directors of Centres, JMI
2. The Officiating Controller of Examinations, JMI
3. The Nodal Officer, SWAYAM, JMI
4. The Hony. Director, IQAC, JMI
5. The Hony. Director, FTK-CIT, JMI (with the request to upload it on the University's website)
6. The Secretary to the Vice-Chancellor, JMI
7. The Section Officer, Registrar's Secretariat, JMI
8. File

16/1/2025
(Saqib Aziz)
Assistant Registrar (C&O)

Any one of the above noted Value Addition Course may be chosen through SWAYAM.

Department of Mathematics
Faculty of Sciences, Jamia Millia Islamia

Multidisciplinary Paper in Mathematics (2024-25) Course Structure and Syllabus

Semester	Code	Title of the Paper	Credits
II	24MATT151	Elementary Calculus	3

24MATT151	Elementary Calculus
Unit-I	Function, limit of a function, algebra of limits. Continuity and Differentiability of a function, Taylor's and McLaurin's series, Maxima and minima of a function of one variable,
Unit-II	Partial derivatives, applications of partial derivatives, Euler's theorem on homogeneous functions, Asymptotes, Test of concavity and convexity, Points of inflexion, multiple points.
Unit-III	Integral of irrational and trigonometric functions, properties of definite integrals, Reduction formulae, Quadrature, Rectification.

Books Recommended

1. Howard Anton, Calculus, John Wiely & Sons, 2012.
2. George B. Thomas, Ross L. Finney, Calculus 11Ed., Pearson Education, 2008.
3. Gorakh Prasad: *Differential Calculus*, Pothishalas Pvt Ltd, Allahabad.
4. Shanti Narayan: *Differential Calculus*, S. Chand & Co.
5. Shanti Narayan: *Integral Calculus*, S. Chand & Co.
6. Khalil Ahmad: *Text Book of Calculus*, World Education Publishers, 2012.

Note: Only for the students who do not have Mathematics papers as Major or Minor.