	Orthogonal matrices, Linear transformations, Solving systems of equations with matrices, Mathematical operations with matrices, Matrix inverses and determinants, Numerical Linear Algebra.
Faculty	Dr. Shaini P
Course Title	**BASIC MATHEMATICAL ANALYSIS**
Course Details	A quick review of sets and functions and planned to build a basic knowledge In the following: Mathematical induction. Finite and infinite sets. Real Numbers. The algebraic property of real numbers. Absolute value and real line. The completeness property of R. Applications of supremum property Intervals, Nested interval property and uncountability of R. Sequence of real numbers Sequence and their limits Limit theorems Monotone sequences Subsequence and Bolzano – Weirstrass theorem Cauchy criterion Properly divergent sequences. Open and closed sets. Sums and Products. Basic Algebraic properties; Further properties, Vectors and Moduli; Complex conjugates; Exponential form; Product and powers in exponential form; Arguments of products and quotients; Roots of complex numbers; Regions in the complex plane.
Faculty	Dr Ali Akbar K

Corse Code MAT 5101: Real Analysis Prerequisites: Calculus.	L	T	P	Credit
	4	1	0	4

Course Category	Core
Course Type	Theory

Course Objective	This course presents a rigorous treatment of fundamental concepts in analysis. To introduce students to the fundamentals of mathematical analysis and reading and writing mathematical proofs. The course objective is to understand the axiomatic foundation of the real number system, in particular the notion of completeness and some of its consequences; understand the concepts of limits, continuity, compactness, differentiability, and integrability, rigorously defined; Students should also have attained a basic level of competency in developing their own mathematical arguments and communicating them to others in writing.
Course Outcome(s)	Describe the fundamental properties of the real numbers that underpin the formal development of real analysis; demonstrate an understanding of the theory of sequences and series, continuity, differentiation and integration; Demonstrate skills in constructing rigorous mathematical arguments; Apply the theory in the course to solve a variety of problems at an appropriate level of difficulty.

Syllabus:

Real number system and its order completeness. Sequences and series of real numbers. Metric spaces: Basic concepts, continuous functions, Intermediate Value Theorem, Compactness, Heine-Borel Theorem.

Differentiation, Taylor's theorem, Riemann Integral, Improper integrals, Sequences and series of functions, Uniform convergence, power series, Fourier series, Weierstrass approximation theorem, equicontinuity, Arzela-Ascoli theorem.

Text books:

1. W. Rudin, Principles of Mathematical Analysis, McGraw-Hill, 1976.
2. Robert Gardner Bartle and Donald R. Sherbert, Introduction to Real Analysis, 4^{th} Edition,Wiley, 2011.

References:

1. C.C. Pugh, Real Mathematical Analysis, Springer, 2002.
2. T. M. Apostol, Mathematical Analysis, 2nd Edition, Narosa, 2002.
3. G. F. Simmons, Introduction to Topology and Modern Analysis, McGraw-Hill, 1963. 4. Stephen Abbot, Understanding Analysis, Springer, New York, NY, 2015

Code:MAT5102: Elementary Number Theory and Basic Algebra Prerequisites: Number systems.	L	T	P	Credit
	4	1	0	4