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| 1. | Title of the course | Real Analysis |
| 2. | Course number | MA513L |
| 3. | Structure of credits | 3-1-0-4 |
| 4. | Offered to | PG |
| 5. | New course/modification to | Modification To MA5107/10 |
| 6. | To be offered by | Department of Mathematics and Statistics |
| 7. | To take effect from | July 2022 |
| 8. | Prerequisite | Nil |
| 9. | Course Objective(s): To introduce the basics concepts in topology and calculus of real-valued functions. To show the polynomial approximation of differentiable functions. | |
| 10. | Course Content: Metric spaces, compact sets, connected sets, convergent sequences, Cauchy sequences, series of nonnegative real numbers, absolute convergence, addition and multiplication of series, rearrangement of series; Limit of functions, continuous functions, monotonic functions, limits at infinity, derivative of functions, mean value theorems, L'Hospital's rule, derivatives of higher order, Taylor's theorem; Definition and existence of Riemann-Stieltjes integral, properties of the integral, the fundamental theorem of integral calculus, rectifiable curves; Sequences and series of functions, uniform convergence, applications of uniform convergence, equicontinuous families of functions, Arzela-Ascoli theorem, the Stone-Weierstrass theorem; Power series, exponential and logarithmic functions, trigonometric functions, Fourier series. | |
| 11. | Textbook(s): 1. Apostol T M, <i>Mathematical Analysis</i> , Narosa Publishing House (1996). 2. Rudin W, <i>Principles of Mathematical Analysis</i> , McGraw-Hill Education (2013). | |
| 12. | Reference(s): 1. Bartle R G and Sherbert D R, <i>Introduction to Real Analysis</i> , Wiley India Pvt. Ltd (2015). 2. Carothers N L, <i>Real Analysis</i> , Cambridge University Press (2000). | |