ELEMENTS OF ANALYSIS

Course Outline

Offering by	Department of Mathematics	Eligibility	Any student of BA and B.Com.(H) courses
Paper Code	GE-4(C)	Availability	Offered in 2019-2020
Summary	Elements of analysis is the branch of mathematics dealing with limits and related theories, such as differentiation, integration, infinite series and power series. Real Analysis is the rigorous version of Calculus.		
Prerequisite	None	Other Requirements	
Prohibitive combination	None		

Course Delivery Information

Learning and Teaching Activities	
Assessment	
Additional Comments	
Course Organisers	

Learning Outcomes

Syllabus

Unit - I	GE-4. (C) (Dept. of Mathematics) Finite and infinite sets examples of countable and uncountable sets. Real line; absolute value bounded sets suprema and infima, statement of order Completeness property of R, Archimedean property of R, intervals. Real sequences, Convergence, sum and product of convergent sequences, proof of convergence of some simplese quences such as $(-1)^n/n$, $1/n^2$, $(1+1/n)^n$, x^n with $|x|<1$, a_n/n, where a_n is a bounded sequence. Concept of cluster points and statement of Bolzano Weierstrass' theorem. Statement and illustration of Cauchy convergence criterion for sequences. Cauchy's theorem on limits, order preservation and squeeze theorem, monotone sequences and their convergence.	0 Lectures
Unit - II	Definition and a necessary condition for convergence of an infinite series. Cauchy convergence criterion for series, positive term series, geometric series, comparison test, limit comparison test, convergence of p-series, Root test, Ratio test, alternating series, Leibnitz's test. Definition and examples of absolute and conditional convergence.	0 Lectures
Unit - III	Definition of power series: radius of convergence, Cauchy-Hadamard theorem, statement and illustration of term-by-term differentiation and integration of power series. Power series expansions for exp(x), sin(x), cos(x), log(1+x) & their properties.	0 Lectures

Additional Info	

Reading List

1. R.G. Bartle and D.R. Sherbert: Introduction to Real Analysis, John Wiley and Sons (Asia) Pte. Ltd., 2000. 2. C. P. Simon and L. Blume: Mathematics for Economists, W W Norton and Company, 1994.	3. K. Sydsaeter and P.J. Hammod, Mathematics for Economics Analysis, Pearson Education, 2002