ADD ON COURSE

Organised by

Department of Mathematics
in collaboration with IQAC

Vivekananda Mahavidyalaya, Purba Bardhaman

(Approved by UGC, NAAC Accredited and affiliated to the University of Burdwan)

ON

ELEMENTS OF REAL AND ABSTRACT ANALYSIS

Date : From 8th August 2023

Total Classes : 36 Hours

Venue: Department of Mathematics, Vivekananda Mahavidyalaya

ELEMENTS OF REAL AND ABSTRACT ANALYSIS

Course Objective :

The Objective of the course is to equip students with advance knowledge of Real and Abstract Analysis for their future studies and serve as a bridge between the UG and PG curriculum. It will also broaden the mathematical thinking ability and allow students to view the contents with wider perspective which will also encourage students to learn and apply higher mathematics.

Who are eligible for joining the Course:

Students who are pursuing B.Sc. in mathematics as a major subject can apply for the course. The students upon joining the course must attend the classes with due diligence and must fulfil the requirement of appearing the final examination on completion of the course.

Chief Patron :
Sri Paresh Chandra Sarkar
President
Governing Body
Vivekananda Mahavidyalaya
Purba Bardhaman

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Contact Us :
Email : vmmathematics20@gmail.com
Visit us on : www.vmbdn.in
Google form : https://forms.gle/9x9xZfE2NKGbVKZq5

Last date for filling online forms : 8th August 2023

Form link : https://forms.gle/9x9xZfE2NKGbVKZq5

Topics that will be covered during the course :

Unit 1: Real Analysis:

Functions of Bounded Variation, absolutely continuous functions, Riemann-Stieltjes integral (R-S integral) and it's relationship with Riemann integral and simple theorems and applications. Geometric interpretation of R-S integral. Lebesgue measure, Set of measure zero. Cantor set and its properties, measurable sets, Borel set and its comparative study with Lebesgue measurable set, non-measurable sets, measurable functions.   14H

Unit 2: Functional Analysis:

Theorem of Cantor and Baire, Banach's Fixed Point Theorem, Application of Banach's Fixed Point Theorem in numerical analysis and differential equations, as a recapitulation. Normed linear Spaces (NLS). Spaces of continuous functions as examples. Banach spaces. Convex sets in Normed linear spaces. Bounded linear operators over NLS.   10H

Unit 3: Basic concepts of general topology:

Topological space, subspace topology, neighbourhood system, examples including metric topology, Sorgenfrey line, closed sets, base and subbase for open sets and closed sets, comparison of two topologies, closure and interior of a set, dense subset, convergence of a sequence, continuous functions, open map, closed map - their properties, homeomorphism, first and second countable spaces, separable and Lindelof spaces and their comparative study, separation axioms, Urysohn's lemma, Tietze's extension theorem, neighbourhood axioms, closed sets axioms, Kuratowski closure axioms for topology. Topological sum, finite product topology.   12H

Evaluation :

At the end of the course, there will be an examination to check the basic understanding of the topic and it is mandatory for the students to appear the examination. After fulfilment of the course requirements, which includes passing the written examination and attending all classes, each candidate will be awarded an add-on course certificate in "Elements of Real and Abstract Analysis".

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