

# MTH312 Real Analysis I

**Level:** 3

**Credit Units:** 5 Credit Units

**Language:** ENGLISH

**Presentation Pattern:** EVERY JAN

## **Synopsis:**

MTH312 Real Analysis I will introduce students to the notions of convergence and techniques of mathematical analysis. The course develops concepts of limits and continuity rigorously. Mathematical rigor will be emphasized for this course. Students will be exposed to and be expected to acquire the skills to read and write mathematical proofs

## **Topics:**

- Completeness Axiom
- Convergent Sequences
- Monotone Convergence Theorem
- Subsequences
- Bolzano-Weierstrass Theorem
- Cauchy Sequences
- Upper and Lower Limits
- Limits of Functions
- Continuous Functions
- Intermediate Value Theorem
- Extreme Value Theorem
- Inverse Functions

## **Textbooks:**

MTH312 Study Guide  
ISBN-13: SG-1815

Introduction to Real Analysis (e-text) 4th Robert G. Bartle, Donald R. Sherbert John Wiley  
ISBN-13: 9781119496786

**Learning Outcome:**

- Show the validity of given mathematical statements in real analysis.
- Give examples of mathematical statements in real analysis.
- Apply epsilon-delta arguments to prove mathematical statements in real analysis.
- Use the Monotone Convergence Theorem and/or Bolzano-Weierstrass Theorem to prove mathematical statements in real analysis.
- Compute the limit supremum, limit infimum or limit of a sequence.
- Determine whether given function(s) are continuous and/or uniformly continuous.

**Assessment Strategies - Regular Semester (Evening Class):**

<b>Components</b>	<b>Description</b>	<b>Weightage Allocation (%)</b>
Overall Continuous Assessment	COMPUTER MARKED ASSIGNMENT 1	10
	TUTOR-MARKED ASSIGNMENT 1	20
Overall Examinable Components	Written Exam	70
<b>Total</b>		<b>100</b>

\*The information listed is subject to review and change.