

Module code

SPM-2207

Type of module

Undergraduate: Mathematical Sciences – Major Core

Real Analysis



Modular credits

4

Total student
engagement

56 hours

Prerequisite

**SPM-2201 Advanced
Mathematical
Methods for the
Sciences**

Anti-requisite

None

Aims

To develop students' ability to analyse and apply the fundamental concepts of real analysis, including sequences, series, continuity, differentiability, and Riemann integration, to construct rigorous mathematical arguments and solve theoretical problems.

Module learning outcomes (MLO)

On successful completion of this module, a student will be expected to be able to:

MLO 1

Analyse the real number system, including sequences of real numbers and their convergence.

MLO 2

Analyse and apply the concepts of limits of sequences and the convergence of series of real numbers.

MLO 3

Evaluate the analytic properties of real-valued functions, such as continuity and differentiability and analyse continuous and differentiable functions.

MLO 4

Formulate and prove theorems concerning the Riemann integral, including Darboux's sums and the Riemann criterion of integrability.

MLO 5

Develop independent mathematical reasoning to address complex problems involving integrability and classes of Riemann integrable functions.

Module contents

The real numbers. Sequence of numbers. Series of numbers.

Continuous functions. Differentiable Functions.

The Riemann integral: Riemann integrability, Darboux's sums, Riemann criterion of integrability, properties of Riemann integrable functions, classes of integrable functions, the mean value theorem for the Riemann integral, the fundamental theorem of integral calculus.

Assessment

60%

Examination

40%

Coursework

Examination
60%

Class tests
30%

■ Examination — 60% ■ Class tests — 30% ■ Assignment — 5% ■ Tutorial participation — 5%

Formative assessment

Weekly discussion
and feedback

Summative assessment

COMPONENT

WEIGHTING

Examination

60%

Coursework

40%

Individual

40%

Class tests

30%

Assignment

5%

Tutorial participation

5%

Graduate attributes and skills

Programme learning objectives (PLO) addressed

1	PLO 1 (Core Mathematical Knowledge)	2	PLO 2 (Analytical Problem-Solving)
4	PLO 4 (Mathematical Communication)	6	PLO 6 (Adaptability And Lifelong Learning)

Sustainability concept addressed

4	SDG 4 Quality Education
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Digital skills/software used (not limited to)

- Learning management and collaboration platforms (e.g. Canvas, MS Teams)
- Mathematical and computational software (e.g. MATLAB, Mathematica)

Micro-credentialling option No	Stackable towards GenBESTARI Undergraduate Degree Programme or other relevant Lifelong Learning Programmes No
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Document details

Office **ODVCE** Document date **26 June 2026** Status **New** Approval **GBF (12/02/2026)**