

Syllabus of Mathematical Analysis III

- Lecture time: Monday, Thursday 16:00–18:00
- Lecture room: Block S16, Room 04–30
- Tutorial time: Tuesday 10:00–11:00 and Friday 14:00–15:00
- Tutorial room: Block S17, Room 05–11 (T), 04–04 (F)
- Prerequisite: MA3110 or MA3110S
- Course description: this module is an introduction to analysis in the setting of metric spaces. There are at least two advantages by adopting this slightly abstract point of view. First of all, it helps to crystallize fundamental concepts and elucidate the roles they play in the theory. Secondly, it provides a unified framework for applications of the results and techniques of mathematical analysis. This module will cover the basic theory of metric spaces and sample applications to other areas of mathematics. It is highly recommended to students majoring in pure mathematics and to those who are interested in applied mathematics with an analytical flavour.
- Course contents:
 - Definition and examples of metric spaces
 - Convergence of sequences
 - Topology of a metric space
 - Continuous mappings
 - Completeness
 - Principle of contraction mappings and applications
 - Compactness
 - Connectedness
 - Sequences and series of functions
- References:
 - A. N. Kolmogorov and S. V. Fomin, *Elements of the Theory of Functions and Functional Analysis*, Dover, 1999. (Chapter 2)
 - W. Rudin, *Principles of Mathematical Analysis*, 3rd edition, McGraw-Hill, 1976. (Chapters 2, 3, 4, 7)
 - W. R. Parzynski and P. W. Zipse, *Introduction to Mathematical Analysis*, McGraw-Hill, 1987. (Chapter 10)
- Assessment: Assessment of students will be based on
 - a 1.5-hour test during lecture time (*tentatively* on 6, October 2012), 25%
 - tutorial participation, 5%,
 - a two-hour final examination, 70%.

Any student who is absent without a valid reason from an assessment will be given zero mark for that assessment.