Aims

The main focus of the course is on independent learning. The course will help students to

- Develop analytical skills
- Deepen and broaden their knowledge of linear algebra and analysis
- Apply the acquired mathematical tools to real life problems
- Improve their communication skills, with emphasis on communicating mathematical ideas with a significant technical content
- Work both individually and in a group
- Understand and construct rigorous mathematical arguments

Syllabus

- **Content.** The course will cover a variety of mathematical topics. It will include, but not necessarily be restricted to, topics in: i) advanced linear algebra, naturally building on the knowledge acquired in the first semester course Linear algebra; ii) analysis, deepening and complementing the content of Calculus A and B; iii) applications of linear algebra and analysis to real life problems.

- **Format.** Only a small part of the course (overall roughly one third) will be delivered in the style of a classic taught course. Most of the lectures will be of tutorial-type, gradually aiding the students towards an active, critical and independent way of learning mathematics.

Students will be given regular written and oral assignments, to be completed individually or in group. Marks will be awarded for the quality of the solution and the clarity of the presentation. The purpose of the assignments is to develop analytical skills, deepen the students understanding of core topics, such as linear algebra and analysis, and to learn how to acquire new mathematical knowledge, both independently and through discussions with your peers and with the lecturer.

Teaching and Assessment

**Contact Hours:** 4 lectures per week  
**Assessment:** 100% by class tests or other continuous assessment  
0% by end of course 2-hour exam  
**Resit Type:** Coursework
By the end of the course, students should be able to:

- be more independent in the way they study and understand rigorous mathematical arguments
- become familiar with more advanced linear algebra and analysis topics
- present mathematical concepts in a clear and precise way