

**COURSE NAME:** RESEARCH PROJECT IN MATHEMATICS

**COURSE CODE:** MATH3423

**LEVEL:** III

**SEMESTER:** II

**NUMBER OF CREDITS:** 3

**PREREQUISITES:**

MATH 2401, MATH2420, Courses prescribed by the supervisor with the nature of the project.

**RATIONALE:**

The success of our graduates relies not only on the knowledge and skills that they have acquired over their time at university, but also their ability to use them while carrying out independent investigation, to construct mathematical models under realistic working conditions, to work effectively in groups of their peers, and to effectively communicate complex ideas. This course is designed to provide students with an opportunity to practice all of these.

**COURSE DESCRIPTION:**

Students will carry out a research project in groups of no more than four, under the close supervision of one or more faculty members. Each student should have a distinct, well-defined role in the project. The group will report its findings in the form of a written thesis, and each student in the group will be required to make an oral presentation on their role in the work.

The nature of the project will encourage independent learning as a member of a team of peers, and by the end of the course successful students will have mastered a mathematical topic or technique, and acquired the communication skills to demonstrate this mastery in written and oral form to a committee of experts.

**LEARNING OUTCOMES:**

By the end of the project, students will be able to:

- create a research plan by decomposing a mathematical research project into sub-tasks, and identifying achievable objectives;
- apply critical thinking and analytical skills to achieve those objectives, under the guidance of their supervisor;
- apply inter-personal skills in order to successfully participate in group activity;
- present their results clearly and concisely using appropriate tools of communication.

## **SYLLABUS:**

Project topics will be decided upon by faculty members of the Department of Mathematics, if appropriate with input from students. Topics should reflect the area of expertise of the faculty member who will act as supervisor, the interests of the student, and the objectives of the student's chosen major. Projects may require the theoretical or computational investigation of a mathematical topic, the construction of a model for a real-world phenomenon using skills developed in the course of the students' studies. Reading projects centered on advanced mathematical topics are also acceptable.

Ordinarily, the supervisor should be a member of the Department of Mathematics, however if appropriate a co-supervisor from another department may be appointed if their expertise is necessary for the successful completion of the project.

## **TEACHING METHODOLOGY:**

Students will work in groups of no more than four under the close supervision of a faculty supervisor. Given the relative lack of experience of undergraduate students in research activity, and the relatively short period over which the project will be carried out, the level of supervision may be higher than would be appropriate for an MPhil or PhD project.

## **ASSESSMENT:**

The project assessment has two components:

1. Written thesis – 70% of overall grade
2. Oral examination – 30% of overall grade

The written component will be examined by the project supervisor. The oral component will be examined by a committee consisting of the project supervisor and two appointed internal examiners with an appropriate level of expertise in the subject matter.

The format of the oral examination for each group will be as follows: each individual student will give an oral presentation lasting no more than 10 minutes, followed by questions from the examination committee. The oral examination will be chaired one of the appointed internal examiners.