NOTICE

MATH 3423

(Undergraduate Research Project)

Sem. II, 2020-2021

This is hereby to notify all the students that if you are planning to do the undergraduate research project (MATH 3423) in Sem. II, 2020-2021 please contact the lecturer through email with whom you would like to work and finalize your topic. This will help you to concentrate on your work from the beginning of the semester.

Also please find the important points as below for your kind information.

- Making contact with a lecturer is not enough but both the lecturer and the student must agree.
- Students who wish to work as a group (not more than four) should approach the lecturer as a group.
- Student can work individually for a project (not as a group) with the consent of the supervisor.
- Supervisor may form a group for the project if he/she wishes.
- The work will carry out under the close supervision of one or more faculty members.

Possible supervisors name, available topics and course outline can be found as below.

After consulting the lecturer and finalizing the topic send the details in the below format to Ms. Marsha Jack (Senior Secretary, Mathematics Department) and Dr. Diptiranjan Behera (undergraduate research project coordinator) **by the first week of the second semester (i.e. particularly by 22-01-2021).**

Name of the student and ID	Supervisor's Name	Title of the research project /Topic	Email ID	Contact Number

If you wish you may please write the other lecturers if they are not in the list for their availability.

Available topics and possible supervisors

Sl. No.	Name of the Supervisor	Topics
1	Nagarani Ponakala	• Modelling groundwater flow and contaminant transport • Special functions of mathematical physics

2	Sam McDaniel	• Determining risk factors associated with COVID19 Deaths using Logistic Regression • The Debate: Classical versus Bayesian Statistics
3	Kirk Morgan	• Application of Fourier Series or Integral Transforms to Financial, Engineer, Biological or Economical problems. • Application of Differential Equations to Biological, Financial, or Economical problems.
4	Britta Hay	• Financial Mathematics, General Insurance or Pensions
5	Howard Hines	• Pensions
6	Mahesha Narayana	• Mathematical modelling of thin film lubrication • Series solution of differential equations
7	Tamika Royal-Thomas	• Emerging Trends in Data utilizing Longitudinal Analysis. (For example, the data could be looking at a disease such as diabetes, heart disease, cancer among other diseases over time or it may be financial data over time). • The use of Survival Analysis to determine life expectancy of a human or a machine or an animal due to a disease or other factors/ scenarios. • Empirical data analysis examining factors and models that are associated with the Covid-19 pandemic.
8	Nordia Thomas	• Statistics for Financial Mathematics
9	Diptiranjan Behera	• Solution to nonlinear differential equations • Fuzzy differential equations and its applications

Course Outline

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 indentifying 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.