MA3530: SELECTED TOPICS ON MATHEMATICS

Effective Term
Semester A 2025/26

Part I Course Overview

Course Title
Selected Topics on Mathematics

Subject Code
MA - Mathematics
Course Number
3530

Academic Unit
Mathematics (MA)

College/School
College of Science (SI)

Course Duration
One Semester

Credit Units
1

Level
B1, B2, B3, B4 - Bachelor's Degree

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
MA1301 Enhanced Calculus and Linear Algebra II

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses
Nil

Part II Course Details

Abstract
This is a reading course that students have to read at least one classical and important textbook on selected mathematical topics that are suggested by their supervisors. They have to apply mathematical knowledge and analytical skills to solve

practical/research problems. In this way, they gain research experience and develop problem-solving abilities. They need to give presentations on the materials that they learn from the textbooks and submit a report at the end of the course. This provides training to their presentation skill and enhances their report writing ability.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Acquire fundamental knowledge on selected topics by reading classical textbooks		x	x	
2	Apply mathematical knowledge and computing techniques of selected topic(s) to solve related problems.			x	x
3	Acquire effective communication skills of presenting mathematical knowledge professionally.		x	x	
4	Give presentations summarizing the materials learnt from textbooks and complete well-structured report.			x	x
5	the combination of CILOs 1-4		x	x	x

A1: Attitude
Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.

A2: Ability
Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to real-life problems.

A3: Accomplishments
Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

Learning and Teaching Activities (LTAs)

	LTAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Consultation	Learning through consultation helps students identify appropriate themes of the research, acquire knowledge and techniques of specific topics from supervisors.	1, 2, 3	10 hours in total
2	Seminar presentation	Learning through presentations enables students to report research development of a selected topic orderly and/or to relate its relevance to subject knowledge.	3, 4, 5	3 hours in total

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("-" for nil entry)	Allow Use of GenAI?
1	Continuous progress	1, 2, 3, 4	40	Student's progress is monitored regularly so as to identify any problem encountered in self-study and ensure he/she is likely to complete the reading of required materials timely in a satisfactory manner.	Yes
2	Report	1, 2, 3, 4, 5	30	It should include student's own account of investigations and findings, with a systematic and critical exposition of knowledge in literature.	Yes
3	Oral presentation	4	30	The student is required to present materials coherently, with all the necessary references stated.	Yes

Continuous Assessment (%)

100

Examination (%)

0

Additional Information for ATs

100% coursework assessment (based on continuous progress, report and oral presentations)

Assessment Rubrics (AR)

Assessment Task

1. Continuous Progress

Criterion

Ability to understand research materials by self-study, problem solving skills

Excellent (A+, A, A-)

High

Good (B+, B, B-)

Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
2. Report

Criterion
Evaluation is based on the following points: organization, method, results and practical significance.

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Assessment Task
3. Oral Presentation

Criterion
The statement of the problem solving; the ability of delivering complex concepts; the ability to answer questions

Excellent (A+, A, A-)
High

Good (B+, B, B-)
Significant

Fair (C+, C, C-)
Moderate

Marginal (D)
Basic

Failure (F)
Not even reaching marginal levels

Part III Other Information

Keyword Syllabus

The selected topics are from some classical textbooks in applied mathematics such as, ordinary differential equations, partial differential equations, dynamical systems, and etc. Students are required to gain a deep understanding of a particular topic and make clear written and oral presentations.

Reading List

Compulsory Readings

	Title
1	Nil

Additional Readings

	Title
1	Lawrence C. Evans, Partial Differential Equations, 2nd Edition, Graduate Studies in Mathematics Volume 19, American Mathematical Society, 2010.
2	Qing Han and Fanghua Lin, Elliptic Partial Differential Equations: 2nd Edition (Courant Lecture Notes), American Mathematical Society, 2011.
3	Ali Hasan Nayfeh, Perturbation Methods, Wiley-VCH Verlag, 2004.
4	Harmonic Analysis: Real-Variable Methods, Orthogonality, and Oscillatory Integrals, Princeton University Press, 1993.
5	Deep Learning, The MIT Press, 2016