GE1350: ESSENTIAL MATHEMATICS IN DAILY LIFE

Effective Term
Semester A 2022/23

Part I Course Overview

Course Title
Essential Mathematics in Daily Life

Subject Code
GE - Gateway Education
Course Number
1350

Academic Unit
Mathematics (MA)

College/School
College of Science (SI)

Course Duration
One Semester

Credit Units
3

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

GE Area (Primary)
Area 3 - Science and Technology

GE Area (Secondary)
Area 2 - Study of Societies, Social and Business Organisations

Medium of Instruction
English

Medium of Assessment
English

Prerequisites
Nil

Precursors
Nil

Equivalent Courses
Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

Mathematics is everywhere. This course aims to provide an understanding of the link between mathematics and daily life in areas such as social and biological sciences. In the course, we will describe the roles of mathematics in solving crime, coding, and developmental biology. Through some surprising examples, students will understand how powerful mathematics is in their daily lives. The mathematical tools we will discuss in this course include the basic concepts of probability, number sequences, graph theory and logic, but students are not expected to have any prior knowledge of these topics. Rather than developing abstract theoretical knowledge, the focus of the course will be applying mathematical concepts to real-world applications. To enhance the learning experience, mathematical examples from some films and dramas will be discussed during the course. Through group projects related to daily life, students will extend their views from abstract theories to concrete examples, and discover that they cannot live without mathematics.

Course Intended Learning Outcomes (CILOs)

	CILOs	Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Identify the presence of mathematical concepts in examples from daily life	30			x
2	Refine and use mathematical concepts to understand different applications	30		x	x
3	Develop critical thinking skills with regard to application of mathematics	40	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.

Teaching and Learning Activities (TLAs)

	TLAs	Brief Description	CILO No.	Hours/week (if applicable)
1	Lecture	Brief introduction of the history of mathematics and its applications	1	3/Week 1
2	Lecture	Basic counting method and probability theory	1, 2, 3	6/Week2-3
3	Lecture	Modeling biological population systems	1, 2, 3	6/Week 4-5
4	Lecture	Elementary number theory in coding	1, 2, 3	9/Week 6-8

5	Lecture	Mathematics in voting systems	1, 2, 3	6/Week 9-10
6	Lecture	Basic game theory	1, 2, 3	6/Week 11-12
7	Lecture	Mathematics in Media	1, 2, 3	3/Week 13

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks (e.g. Parameter for GenAI use)
1	Test	1, 2	30	Week 7
2	4 Assignments	1, 2, 3	20	Including a project with video report

Continuous Assessment (%)

50

Examination (%)

50

Examination Duration (Hours)

2

Assessment Rubrics (AR)

Assessment Task

1. Examination

Criterion

Ability to explain in detail and accuracy

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. Test

Criterion

Ability to explain in detail and accuracy

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. Assignments

Criterion
Ability to explain in detail

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
Applied mathematics, number sequences, logic, probability, mathematical modeling

Reading List

Compulsory Readings

	Title
1	Lecture notes will be provided

Additional Readings

	Title
1	Stein, S. K. (2010) Mathematics: The Man-Made Universe, 3rd edition, Dover Publications
2	Devlin, K. and Lorden, G. (2007) The Numbers Behind NUMB3RS: Solving Crime with Mathematics, Plume
3	Stewart, I. (2011) Mathematics of Life, Basic Books

4	Singh, S. (2002) The Code Book, Delacorte Press
5	Polster, B. and Ross, M. (2012) Math Goes to the Movies, Johns Hopkins University Press

Annex (for GE courses only)

A. Please specify the Gateway Education Programme Intended Learning Outcomes (PILOs) that the course is aligned to and relate them to the CILOs stated in Part II, Section 2 of this form:

Please indicate which CILO(s) is/are related to this PILO, if any (can be more than one CILOs in each PILO)

PILO 1: Demonstrate the capacity for self-directed learning

3

PILO 2: Explain the basic methodologies and techniques of inquiry of the arts and humanities, social sciences, business, and science and technology

1, 2

PILO 3: Demonstrate critical thinking skills

3

PILO 4: Interpret information and numerical data

1, 2

PILO 5: Produce structured, well-organised and fluent text

1, 2

PILO 6: Demonstrate effective oral communication skills

3

PILO 7: Demonstrate an ability to work effectively in a team

3

PILO 8: Recognise important characteristics of their own culture(s) and at least one other culture, and their impact on global issues

1, 2, 3

PILO 10: Demonstrate the attitude and/or ability to accomplish discovery and/or innovation

1, 2, 3

B. Please select an assessment task for collecting evidence of student achievement for quality assurance purposes. Please retain at least one sample of student achievement across a period of three years.

Selected Assessment Task

Examination papers.