

SYE6601: INTRODUCTION TO ARTIFICIAL INTELLIGENCE: CONCEPTS AND APPLICATIONS

Effective Term

Semester A 2026/27

Part I Course Overview

Course Title

Introduction to Artificial Intelligence: Concepts and Applications

Subject Code

SYE - Systems Engineering

Course Number

6601

Academic Unit

Systems Engineering (SYE)

College/School

College of Engineering (EG)

Course Duration

One Semester

Credit Units

3

Level

P5, P6 - Postgraduate Degree

Medium of Instruction

English

Medium of Assessment

English

Prerequisites

Nil

Precursors

Nil

Equivalent Courses

Nil

Exclusive Courses

Nil

Part II Course Details

Abstract

This course provides students with a rigorous foundation of concepts, theory, and methods in artificial intelligence (AI), covering core AI techniques including supervised/unsupervised learning, reinforcement learning, deep learning, computer vision, large language models, their applications in industry, and AI ethics and governance. Emphasis will be placed on both theoretical understanding and practical application of AI to real-world problems across industries. Students will gain the skills to design, evaluate, and deploy AI solutions effectively.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Understand fundamental AI concepts, including core algorithms, models, and their theoretical underpinnings.	30	x	x	
2	Apply foundational AI techniques to solve practical problems.	20	x	x	
3	Design and implement AI solutions to drive industrial innovation.	30	x	x	x
4	Evaluate the societal and ethical impacts of AI technologies.	20	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	Large Class Activities	Take place in a classroom setting and consist of lectures and student activities in between.	1, 2, 3, 2	2
2	Tutorial	Students will do exercise in the class with assistance of teacher and tutors.	1, 2, 3, 2	1

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("- " for nil entry)	Allow Use of GenAI?
1	Assignments	1, 2, 3, 2	30	-	No
2	Course Project	1, 2, 3, 2	40	-	Yes

Continuous Assessment (%)

70

Examination (%)

30

Examination Duration (Hours)

2

Minimum Continuous Assessment Passing Requirement (%)

0

Minimum Examination Passing Requirement (%)

30

Additional Information for ATs

For a student to pass the course, at least 30% of the maximum mark for the examination should be obtained.

Assessment Rubrics (AR)**Assessment Task**

Assignments

Criterion

The assignments will assess students' comprehension of core AI methodologies, their ability to implement diverse AI techniques, and their understanding of AI's societal and ethical impacts.

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

Course Project

Criterion

The course project will assess students' abilities in paper reading and writing, project presentation, and real-world AI solution development for industrial innovation.

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

Final Exam

Criterion

The final exam will assess students' understanding of the concepts, theory, and methods in AI.

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

- Machine learning fundamentals
 - Supervised learning
 - Unsupervised learning
- Reinforcement learning
- Deep learning
- Computer vision
- Large language models
- AI applications in industry
- AI ethics and governance

Reading List

Compulsory Readings

Title	
1	S. J. Russell and P. Norvig. Artificial Intelligence: A Modern Approach
2	C. M. Bishop. Pattern Recognition and Machine Learning
3	Lecture Notes

Additional Readings

Title	
1	I. Goodfellow, Y. Bengio, and A. Courville. Deep Learning
2	R. S. Sutton and A. G. Barto. Reinforcement Learning: An Introduction
3	K. P. Murphy. Machine Learning: A Probabilistic Perspective; Probabilistic Machine Learning: An Introduction; Probabilistic Machine Learning: Advanced Topics