

SYE6602: AI-DRIVEN INNOVATION: SEMINARS AND PROJECTS

Effective Term

Semester A 2026/27

Part I Course Overview

Course Title

AI-Driven Innovation: Seminars and Projects

Subject Code

SYE - Systems Engineering

Course Number

6602

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 equips postgraduate students with the knowledge and hands-on experience required to turn cutting-edge artificial-intelligence techniques into innovative products and services. Each week, invited experts from academia and industry deliver seminars on emerging AI technologies, success stories and ethical or commercial challenges. In parallel, students work in small interdisciplinary teams (3-4 members) to design, implement, and evaluate an AI-driven solution to a real-world problem using Python and open-source frameworks. Milestones include a project proposal, mid-term progress review, and a final demo day with written report and oral presentation. By completing the course, students will be able to critically analyse new AI developments, build functional prototypes, communicate their ideas effectively, and reflect on the broader societal and business implications of AI-enabled innovation.

Course Intended Learning Outcomes (CILOs)

CILOs		Weighting (if app.)	DEC-A1	DEC-A2	DEC-A3
1	Analyse and discuss current trends, opportunities, and challenges in AI-driven innovation.	25	x	x	
2	Analyse and discuss current trends, opportunities, and challenges in AI-driven innovation.	25		x	x
3	Analyse and discuss current trends, opportunities, and challenges in AI-driven innovation.	25		x	x
4	Evaluate ethical, societal, and business impacts of AI solutions and communicate recommendations clearly.	25	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	L1	Expert Seminars & Guest Talks – Weekly 2-hour sessions by researchers and industry practitioners.	1, 4	1.5
2	L2	Student-Led Paper Discussions – Short presentations & moderated Q&A on selected AI research papers.	1, 4	0.5

3	L3	Team Project Workshops – Guided lab/tutorial time for teams to develop, test, and iterate prototypes.	2, 3	1
4	L4	Project Milestone Presentations – Proposal pitch (Week 3), Mid-term review (Week 8), Final demo day.	2, 3, 4	

Assessment Tasks / Activities (ATs)

	ATs	CILO No.	Weighting (%)	Remarks ("- for nil entry)	Allow Use of GenAI?
1	A1. Seminar Attendance & Participation	1, 4	10	≥80% attendance; active Q&A and online reflections.	No
2	A2. Weekly Reflection Notes (5 best of 10)	1, 4	10	200-word reflections on selected seminars/papers.	No
3	A3. Project Proposal & Pitch (Week 3)	2, 3	10	2-page proposal and 5-minute team pitch.	Yes
4	A4. Mid-Term Progress Presentation (Week 8)	2, 3	10	8-minute presentation + demo with peer/instructor feedback.	Yes
5	A5. Final Prototype & Demonstration	2, 3	30	Working Python-based system evaluated on functionality and innovation.	Yes
6	A6. Final Written Report (~6,000 words)	2, 3, 4	20	IEEE format with problem, method, experiments, ethics, and business.	Yes
7	A7. Final Oral Presentation (15 min + Q&A)	2, 3, 4	10	Evaluated on clarity, delivery, and Q&A performance.	Yes

Continuous Assessment (%)

100

Examination (%)

0

Examination Duration (Hours)

0

Minimum Continuous Assessment Passing Requirement (%)

60

Minimum Examination Passing Requirement (%)

0

Assessment Rubrics (AR)

Assessment Task

Attendance & Participation (Refer to Assessment Task A1 & A2)

Criterion

Engagement and preparedness

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

Project Deliverables (Refer to Assessment Task A3 & A5)

Criterion

Innovation, execution, teamwork

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

Report & Presentation (Refer to Assessment Task A4 & A6 & A7)

Criterion

Clarity, depth, and communication

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

Artificial intelligence innovation, machine learning pipelines, PyTorch, large language models, prompt engineering, data ethics, AI governance, Python prototyping, agile teamwork, product-market fit, ESG, intellectual property, pitching AI products.

Reading List

Compulsory Readings

Title	
1	Selected AI research papers and case studies distributed weekly via Canvas.
2	Russell, S. & Norvig, P. Artificial Intelligence: A Modern Approach (4th ed.), Pearson, 2021. (Selected chapters)

Additional Readings

Title	
1	Géron, A. Hands On Machine Learning with Scikit Learn, Keras & TensorFlow (3rd ed.), O’ Reilly, 2022.
2	Godbole, A. Lean AI: How Innovative Start-Ups Use Artificial Intelligence to Grow, O’ Reilly, 2020.
3	Najim, Y. Practical MLOps, O’ Reilly, 2023.
4	Floridi, L. & Cowls, J. The Ethics of Artificial Intelligence: Principles, Challenges and Opportunities, OUP, 2024.