Subject Description Form

Subject Code	COMP5571
Subject Title	Introduction to Generative AI and Its Applications
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	The subject is envisioned for students to embrace and leverage the potential of Generative Artificial Intelligence (AI). It will primarily focus on the nature, development, and implications of Generative AI, its role in innovative research methods, its application across various disciplines, and its ethical and societal implications.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. demonstrate an understanding of the foundational concepts of Generative AI; b. acquire practical skills in using Generative AI technologies; c. demonstrate an awareness of global contemporary ethics issues and the impact of Generative AI applications in daily life.
Subject Synopsis/ Indicative Syllabus	**1. Introduction to Generative AI** - Basics of AI and Generative AI. - History and evolution of Generative AI. - Introduction to deep learning and large AI models. **2. Generative AI applications and impacts** - Generative AI applications and future trends. - AI-assisted research and methodology. **3. Generative AI tools and technology** - Overview of popular Generative AI platforms and their assistance in content ideation, creation, and editing. - Prompt engineering with hands-on practice writing, and iterating on prompts for specific needs. 4. **Generative AI for social good** - Societal implications of Generative AI - Ethical considerations, e.g., data privacy, AI safety, etc.

Teaching/Learning Methodology	**1. Lectures and Seminars** Generative AI concepts and introductions will be given via lectures and seminars. There will be in-class activities (e.g., discussions and exercises) to better engage students in active learning.

	2. **Labs and Tutorials** Hands-on experience will be given via labs and tutorials to reinforce the concepts learned and gain practical skills. Students will be guided through various mini-experiments to explore different Generative AI tools for problem-solving. 39 hours of class activities including - lectures, tutorials, lab, and seminars where applicable.

Assessment Methods in Alignment with Intended Learning Outcomes

Students' performance in this subject will be assessed using a letter-grading system in accordance with the University's convention from grade F (failure) to A+. The relative weighting of the different assessment components are as follows:

Specific assessment methods/ tasks	% weighting	Intended subject learning outcomes to be assessed		
		a	b	c
Exercises and assignments	15%		✓	
Quizzes	20%	✓	✓	✓
Essay	20%	✓		✓
Exam	45%	✓	✓	✓
Total	100%			

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Hands-on exercises and assignments will enable students to practice and apply Generative AI techniques (ILO b).

Quizzes and exams are given to help students better understand the concepts discussed in lectures (ILO a) and to gain more related knowledge via after-class reading (ILO c), and learn how to employ the knowledge to solve real-world problems (ILO b).

Each student should submit a research essay to discuss AI implications in society. It requires a student to read related papers and write a literary review to gain a deeper understanding of the Generative AI concepts (ILO a) and analyze the pros and cons of Generative AI implications in our society (ILO c).

Student study effort expected	**Class Contact:**	
	Class Activities (lectures, seminars, labs, tutorials)	39 hours

	Other student study effort:	
	Self-study, Exercises, Assignments, Quizzes, Exams	46 hours
	Literary review and essay writing	20 hours
	Total student study effort	105 hours
Reading list and references	1. Dan, Jurafsky and H. Martin James. "Speech and language processing: an introduction to natural language processing, computational linguistics, and speech recognition." 3rd Edition, Prentice Hall Series in Artificial Intelligence (2023). 2. Foster, David. "Generative deep learning. " 2nd Edition, O'Reilly Media, Inc. (2022) 3. Russell, Stuart J. "Artificial intelligence a modern approach." 3rd edition, Pearson Education, Inc., 2009. 4. Papers and articles selected from: - Artificial Intelligence - AI Expert - AI Magazine - Applied Intelligence - IEEE Computer - IEEE Intelligent Systems and their Applications - IEEE Trans. Neural Networks	