Subject Description Form

Subject Code	DSAI5201
Subject Title	Artificial Intelligence and Big Data Computing in Practice
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	The objectives of this subject are to: 1. provide students with knowledge of big data technology and applied machine learning techniques, and design solutions for a range of domain and application scenarios. 2. offer hands-on experience in big data and machine learning and focus on problem-solving skills for practical applications.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a) demonstrate a clear conceptual understanding of technologies supporting big data processing, such as methods for storing and structuring data, and visualizing data. b) demonstrate a clear conceptual understanding of AI-related technologies such as constraint satisfaction problem and machine learning. c) know AI tools and techniques typically used in real-world applications. d) demonstrate self-direction in tackling and solving AI problems, and act autonomously in planning and implementing tasks. e) able to present and communicate the outcomes of an AI project to specialists and non-specialist audiences.
Subject Synopsis/ Indicative Syllabus	1. *Big Data:* Characteristics of big data and big data analytics; tools and technologies for data storage, processing, and visualization. 2. *AI and Language:* Applications of text analytics, smart chatbots.

Subject Synopsis/ Indicative Syllabus (Cont'd)	3. *AI and Creativity:* Applications of image/video stylization, story generation, music generation.
	4. *AI and Engineering Systems:* Artificial Intelligence in Robotics. Intelligent Robots and Robotics; Search and Planning.
	5. *Recommendation systems:* Collaborative filtering, content-based filtering, multi-criteria recommendation systems, and mobile recommendation systems.
	6. *Ethics of AI and Big Data:* Ethics of profession, ethics of use, ethics of design, discrimination-aware data, fair machine learning, challenges for good AI.
Teaching/Learning Methodology	Lectures focus on the concepts, knowledge, and applications of the big data ecosystem and machine learning techniques.

Lab sessions for students to provide hands-on experiences in coding and problem-solving skills for real applications.

39 hours of class activities, including lecture, tutorial, lab, etc, where applicable. |

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)				
		a	b	c	d	e
Assignments & Tests	40	✓	✓	✓	✓	✓
Final Project	60	✓	✓	✓	✓	✓
Total	100					

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

Since this course focuses on the practical applications of cutting-edge AI and Big Data technologies, most of the assessment relies on the demonstration of problem-solving skills via the final individual project. Assignments and tests are designed to facilitate students to achieve the intended learning outcomes.

Student Study Effort Expected	Class contact:	
	▪ Class activities (lecture, tutorial, lab, etc.)	39 Hrs.
	Other student study effort:	
	▪ Assignments, projects, exams, self-study	66 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	1. Hands-on Machine Learning with Scikit-Learn, Keras & TensorFlow, O'Reilly, 2019 2. Real World AI: A Practical Guide for Responsible Machine Learning, Lioncrest Publishing, 2021 3. Routledge Handbook of Trust and Philosophy, Routledge, 2020 Papers and articles selected from conferences and journals in machine learning, computer vision, natural language processing, graphics, etc.	