Teaching Plan of AAE1001 (2024/2025 Semester 1)

1. Subject Title and Subject Code
Introduction to Artificial Intelligence and Data Analytics in Aerospace and Aviation Engineering (AAE1001)

2. Enrolment and Class Size
112 Students (48403 -)

3. Subject Intended Learning Outcome (ILO)

Upon completion of the subject, students will be able to:

(i) Demonstrate an understanding of the foundational concepts of Artificial Intelligence and Data Analytics (AIDA);

(ii) Acquire basic skills in using AIDA technologies and applications;

(iii) Articulate examples of how the adoption AIDA could enhance their understanding on aeronautical and aviation engineering; and

(iv) Demonstrate an awareness of global contemporary ethical issues and impact from AIDA applications in daily life.

4. Grading Policy:

(a) Weighting of this course: 100% Continuous assessment

(b) Continuous assessment (CA)

e-Learning module	**(15%)**
Assignment	**(25%)**
Laboratory	**(35%)**
Group project and presentation	**(25%)**

TEACHING PLAN

AAE1001 – Introduction to Artificial Intelligence and Data Analytics in Aerospace and Aviation Engineering
Plan of Teaching, Learning and Assessment –Semester I, 2024/2025

Instructor:
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Time & Venue:
Lecture: Tue 12:30-14:20
Venue: HJ 305

Sem. Week	Topics Taught	Planned Learning Outcomes	Assessment	Timetable, Venue Staff
Wk 1 (3 Sep)	Overview of AI and Data Analytics in Aerospace and Aviation Engineering	• History and concepts of AI. • Familiar with basic concepts of AIDA and how relevant technologies are applied in Aerospace and Aviation Engineering.		**2 hours** LEC/TUT Tue 12:30-14:20 HJ 305 Dr. Guohao ZHANG

Wk 2 (10 Sep)	Fundamentals of Machine Learning	• Understand basic concepts and theory of machine learning. • Familiar with linear regression and classification in supervised learning and its applications.	Assignment 1 (submit by **<u>30 Sep</u>** via Blackboard)	**2 hours** LEC/TUT Tue 12:30-14:20 HJ 305 Dr. Guohao ZHANG
Wk 3 (17 Sep)	Lecture moved to another time slot due to conference attending	N/A		N/A
Wk 4 (24 Sep)	Fundamentals of Deep Learning	• Understand basic concepts and theory of deep learning. • Understand artificial neural networks with single layer perception. • Familiar different deep learning architectures and their characteristics.		**2 hours** LEC/TUT (Time TBC) HJ 305 Dr. Guohao ZHANG
Wk 5 (1 Oct)	***Public Holiday (National Day)***			
Wk 6 (8 Oct)	Apply AI and Data Analytics in Aerospace and Aviation Engineering	• How AI is used for Self-piloted Airplanes, Aircraft Maintenance, Aerospace Manufacturing, Air Traffic Management, and Airport management. • AI in satellite and aerospace engineering.	Assignment 2 (release at the end of Week 6, submit by **<u>5 Nov</u>** via Blackboard)	**2 hours** LEC/TUT Tue 12:30-14:20 HJ 305 Dr. Guohao ZHANG

Wk 7 (15 Oct)	Group Project Overview Introduction of GitHub	• Understanding the framework of engineering project using AIDA • Understanding the importance of GitHub • Installation & environment setup for a GitHub-based project • Understanding the basic functions of GitHub		**2 hours** LEC&LAB Tue 12:30-14:20 HJ 305 Dr. Guohao ZHANG
Wk 8 (Oct 22)	Introduction on Path Planning Group Project Task 1-3	• Understanding the principle of path planning • Able to implement path planning on aviation tasks by codes		**2 hours** LEC&LAB Tue 12:30-14:20 HJ 305 Dr. Guohao ZHANG
Wk 9 (Oct 29)	Collaborative Coding using GitHub	• Understanding the operation of GitHub in a teamwork • Understanding the basic components of a coding project • Able to conduct collaborative coding using GitHub for the group project		**2 hours** LEC&LAB Tue 12:30-14:20 HJ 305 Dr. Guohao ZHANG
Wk 10 (Nov 5)	Group Project Task 4-6	• Able to create new components in the template code to solve advanced tasks • Able to implement AI for the aviation tasks in the group project		**2 hours** LEC&LAB Tue 12:30-14:20 HJ 305 Dr. Guohao ZHANG
Wk 10 (Nov 7)	Group Project Task 7	• Integrate AIDA with the aviation tasks in the group project		**2 hours** LEC&LAB Thu 18:45-20:35 Venue to be confirm Dr. Guohao ZHANG

Wk 11 (Nov 12)	Group Project Conclusion	Understanding the role of collaborative coding and AIDA in aeronautical and aviation engineering	• Presentation report • GitHub repository • Peer assessment evaluation (submit by Nov 26)	**2 hours** LEC&LAB Tue 12:30-14:20 HJ 305 Dr. Guohao ZHANG
Wk 12 (Nov 19)	Group Project Presentation I	• Technical report and presentation skills • Project management and collaboration on engineering tasks	Presentation of the group project results for each group (every student shall present)	**2 hours** LEC&LAB Tue 12:30-14:20 HJ 305 Dr. Guohao ZHANG
Wk 13 (Nov 26)	Group Project Presentation II	• Technical report and presentation skills • Project management and collaboration on engineering tasks		**2 hours** LEC&LAB Tue 12:30-14:20 HJ 305 Dr. Guohao ZHANG

Remarks: N/A