Teaching Plan of AAE1001 (2023/2024 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
87/87

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, 2023/2024

Instructor:
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Time & Venue:
Lecture: Mon 09:30-11:20
Venue: PQ 306 (Week 1),
            PQ 305 (Week 2-8),
            PQ 305 (Week 2-8),
            PQ 306 (Week 9),
            PQ 305 (Week 10-13).

Sem. Week	Topics Taught	Planned Learning Outcomes	Assessment	Timetable, Venue Staff
Wk 1	Overview of AI and Data Analytics in Aerospace and Aviation Engineering	• Familiar with basic concepts of AIDA and how relevant technologies are applied in Aerospace and Aviation Engineering: History and concepts of AI. 1. How AI is used for Self-piloted Airplanes, Aircraft Maintenance, Aerospace Manufacturing, Air Traffic Management, and Airport management. 2. AI in satellite and aerospace engineering.		**2 hours** LEC/TUT Time: 09:30-11:20, 4 Sep Venue: PQ 306 Staff: Dr. Lingxiao WU
Wk 2	Guest Lecture Series 01: Data Analytics and Monetization I	• Gain knowledge of basic data analytics and monetization techniques in practice.		**2 hours** LEC/TUT

				Time: 09:30-11:20, 11 Sep Venue: PQ 305 Staff: Dr. Lingxiao WU, Dr Andy LUK
Wk 3	Guest Lecture Series 02: TBD	• Familiar data analytics in practice.		**2 hours** LEC/TUT Time: 09:30-11:20, 18 Sep Venue: PQ 305 Staff: Dr. Lingxiao WU, Dr. Hanxiang Zhang
Wk 4	Foundations of machine learning	• Gain basic knowledge of statistical learning. • Familiar with linear regression and classification in supervised learning and its applications. • Grasp basic skills for prediction tasks in aviation.	Assignment 1 (submit by 15 Oct via Blackboard)	**2 hours** LEC/TUT Time: 09:30-11:20, 25 Sep Venue: PQ 305 Staff: Dr. Lingxiao WU
Wk 5	No class due to National Day			**2 hours** LEC/TUT Time: 09:30-11:20, 2 Oct Venue: PQ 305 Staff: Dr. Lingxiao WU
Wk 6	Guest Lecture Series 03: Data Analytics and Monetization II	• Gain knowledge of advanced data analytics and monetization techniques in practice.		**2 hours** LEC/TUT Time: 09:30-11:20, 9 Oct Venue: PQ 305 Staff: Dr. Lingxiao WU, Dr Andy LUK
Wk 7	Decision-making in Aviation	• Familiar with the optimization problems in aviation: fleet assignment, aircraft and UAV routing, crew scheduling, etc.	Assignment 2	**2 hours** LEC/TUT

		• Gain basic knowledge of the solution algorithms: simplex method for linear programming, heuristic and evolutionary algorithms	(submit by 7 Nov via Blackboard)	Time: 09:30-11:20, 16 Oct Venue: PQ 305 Staff: Dr. Lingxiao WU
Wk 8	No class due to Chung Yeung Festival			**2 hours** LEC/TUT Time: 09:30-11:20, 23 Oct Venue: PQ 305 Staff: Dr. Lingxiao WU
Wk 9	• 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: Mon 09:30-11:20 PQ 306 Dr. Guohao ZHANG
Wk 10	• 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: Mon 09:30-11:20 PQ 305 Dr. Guohao ZHANG
Wk 11	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: Mon 09:30-11:20 PQ 305 Dr. Guohao ZHANG
Wk 12	• Group project task 4-6	• Able to create new components in the template code to solve advanced tasks • Able to implement AIDA for the aviation tasks in the group project		**2 hours** LEC&LAB: Mon 09:30-11:20 PQ 305

				Dr. Guohao ZHANG
Wk 13	Group project conclusion	• Understanding the role of collaborative coding and AIDA in aeronautical and aviation engineering	(1) Presentation report (2) GitHub repository (3) Peer assessment evaluation	**2 hours** LEC&LAB: Mon 09:30-11:20 PQ 305 Dr. Guohao ZHANG

Remarks: