Subject Description Form

Subject Code	AAE3012
Subject Title	Air Traffic Management and Airport Operations
Credit Value	3
Level	3
Pre-requisite	AAE2004 Introduction to Aviation System and Air Transport Regulation
Exclusion	AAE4003 Airport Services Engineering
Objectives	This subject will provide students with 1. Broad understanding of the airport services in all phases of design and engineering to students; and 2. The essential knowledge in airport facility planning, management and ground services.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Have the basic knowledge of how an airport is operating; b. Apply techniques to optimise the airport operations costs and efficiency, including capacity determination, airport facility selection, facility layout, and facility planning; and c. Establish effective ground manoeuvring such as airport geometry, terminal layout, aircraft configuration optimisation.
Subject Synopsis/ Indicative Syllabus	**Runway planning, analysis and maintenance** – Airfield design and planning (runway, taxiway and apron); Aircraft runway length and take-off weights; Runway slope; Obstacles; Bird control; Foreign object debris; Rubber removal; Runway inspection. **Airport facility planning and engineering** – Airport layout; Design of terminal facilities, baggage handling facilities, freight facilities; Layout planning and optimisation; Ground support equipment and equipment selection; Basic queuing theory and simulation (e.g., simulation of passenger flow for chokepoint analysis). **Air traffic flow and capacity management** – Ground delay programme (GDP): delay assignment (DAS) mode, general aviation airport programme (GAAP), unified delay program (UDP) mode; peak-hour analysis (design peak hour and forecast); Demand management (flight schedule coordination, congestion pricing, slot auction, etc.); Air traffic management (airspace structure, navigation systems, air traffic control tower); Collaborative decision making; Runway capacity (factors affecting runway capacity, e.g., number of runways, landscape, aircraft mix, wind direction, sequencing of movements, noise considerations); NextGen; Airport CDM.

<table>
<tr><td></td><td>Ground manoeuvring and gate planning – Ground operations, ground manoeuvring, gate operations, and terminal servicing; Airport geometry for operating new and existing aeroplane models; Terminal layouts and gate arrangements; Aircraft configuration optimisation.</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>Teaching is conducted through class lectures, case studies and project. Both the basic knowledge and theoretical models are going to be introduced. The understanding of how to address problems by using scientific tools is emphasised. Normally, examples of problem-solving techniques are taught in class and related scenarios are provided to students to enhance their application abilities. Guest speakers in the aviation industry will be invited to deliver talks and students are required to produce short reports for talks to encourage their involvement.
<table>
<tr><td rowspan="2">Teaching/Learning Methodology</td><td colspan="3">Intended subject learning outcomes to be covered</td></tr>
<tr><td>a</td><td>b</td><td>c</td></tr>
<tr><td>1. Lecture</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>2. Case study</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>3. Project</td><td>✓</td><td>✓</td><td>✓</td></tr>
</table></td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="3">Intended subject learning outcomes to be assessed</td></tr>
<tr><td>a</td><td>b</td><td>c</td></tr>
<tr><td>1. Case study reports</td><td>50%</td><td></td><td>✓</td><td>✓</td></tr>
<tr><td>2. Assignments</td><td>30%</td><td></td><td>✓</td><td>✓</td></tr>
<tr><td>3. Group project report</td><td>20%</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>Total</td><td>100 %</td><td colspan="3"></td></tr>
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Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

Overall Assessment:

1.0 × Continuous Assessment

100% Continuous assessment consists of assignments, case study reports and group project report. Case study and group project reports are required to be submitted to show the findings.</td></tr>
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Student Study Effort Expected	Class contact:	
	▪ Lecture	24 Hrs.
	▪ Case Study/ Project	15 Hrs.
	Other student study effort:	
	▪ Assignments/Min-Project/Report	35 Hrs.
	▪ Self-study/Preparation	48 Hrs.
	Total student study effort	122 Hrs.
Reading List and References	1. PS Senguttuvan 2007, Principles of Airport Economics, Excel Books. (or latest edition) 2. Airport Cooperative Research Program (ACRP) Reports, The National Academies of Sciences, Engineering, and Medicine. (or latest edition). 3. Anne Graham 2014, Managing Airports 4th Edition: An International Perspective, Routledge. (or latest edition). 4. Alexander T. Wells 2007, Air Transportation: A Management Perspective, Ashgate. (or latest edition). 5. Norman J. Ashford, Saleh Mumayiz, Paul H. Wright 2011, Airport Engineering: Planning, Design and Development of 21st Century Airports, John Wiley & Sons. (or latest edition).	

Revised in July 2022