

Subject Description Form

Subject Code	AAE2005
Subject Title	Electrics and Electronic for Aeronautical Engineering
Credit Value	3
Level	2
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	<p>This subject will provide students with</p> <ol style="list-style-type: none"> 1. The fundamental knowledge of electrics and electronics in aeronautical engineering; 2. Basic electrical and electronic devices on aircraft; and 3. Design and development of basic electronic device.
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> a. Understand the fundamental concepts of electrical circuits in aeronautical engineering; b. Understand the principle of basic electric devices in aeronautical engineering; c. Apply the appropriate techniques to solve problems in electrical circuits; and d. Design basic electronic devices with the basic knowledge.
Subject Synopsis/ Indicative Syllabus	<p>Basic Principles – Circuit elements; Kirchhoff’s Current Law (KCL); Kirchhoff’s Voltage Law (KVL); Lumped circuit elements; Ohm’s Law.</p> <p>Resistive Network Analysis– Simple resistor circuits: series and parallel circuits; Node voltage method; Mesh current method; Thévenin and Norton Equivalent circuit.</p> <p>Diode and Transistor Circuits: Current-voltage characteristics of p-n junction diode; characteristics of bipolar junction transistors (BJT); Load line and its applications to diode and transistor circuits.</p> <p>Amplifiers - Concept of amplifier; Basic BJT amplifiers: basic structure and symbol, linear analog amplifiers, modes of operation of BJTs, dc equivalent circuit and analysis; Q-point, various dc biasing schemes.</p> <p>Electrical and Electronic Devices on Aircraft - DC Electrics on aircraft such as Switches, Circuit Protection and Capacitors, Batteries, DC Motors, Aircraft Electrical Power Systems; AC Electrics on aircraft such as AC power, Transformers, AC Motors, Semiconductor and Logic Gates; Practical Aircraft Systems Analysis.</p>

Teaching/Learning Methodology	<p>The key concepts and techniques covered in this subject are discussed in lectures and tutorials. The lectures emphasize on fundamental understanding and practical problem-solving techniques. To strengthen understanding of fundamental knowledge of electric and electronic in the field of aeronautical engineering, students have the chances to conduct hands-on exercises in both lectures and tutorials. Furthermore, individual assignments or tests consisting of essays and the numerical problems are involved to allow students recognize their level of understanding and create evidence of learning.</p>																																							
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<p>Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:</p> <p>Overall assessment: 0.4 x continuous assessment + 0.6 x examination</p> <p>Test and assignments are used to make up the continuous assessment and the final examination is included to evaluate and assess the students' learning outcomes in this course. The continuous assessment and the final exam are conducted at different times in the semester to consolidate students' knowledge in lectures and tutorials. They are appropriate in assessing intended learning outcomes.</p>																																								

Student Study Effort Expected	Class contact:	
	▪ Lecture/Tutorial	39 Hrs.
	Other student study effort:	
	▪ Literature Review and Self-learning	46 Hrs.
	▪ Assignments	26 Hrs.
	Total student study effort	111 Hrs.
Reading List and References	<ol style="list-style-type: none"> 1. Giorgio Rizzoni, “Fundamentals of Electrical Engineering”, New York: McGraw- Hill, 2009. 2. Giorgio Rizzoni, James Kearns, “Principles and Applications of Electrical Engineering” 6th Edition, Boston: McGraw-Hill Higher Education, 2018. 3. “E Electrics and Electronics. ATPL Ground Training Series”, CAE Oxford Aviation Academy. 	

January 2022