Subject Description Form

Subject Code	AAE4110
Subject Title	Aircraft Propeller
Credit Value	3
Level	4
Pre-requisite/ Co-requisite/ Exclusion	**Pre-requisite:** AAE2102/IC2133 Aircraft Manufacturing and Maintenance Fundamentals
Objectives	To provide students with knowledge of aircraft propeller and the major design features of modern aircraft propeller.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a. Obtain fundamental knowledge in the area of blade element theory; and b. Demonstrate good understanding of propeller design and construction; and c. Acquire good understanding of propeller control system and protection system; and d. Apply their knowledge and skills to explain the operation of aircraft propellers under both normal and abnormal situations.
Subject Synopsis/ Indicative Syllabus	**Propeller Fundamentals -** Blade element theory; High/low blade angle, reverse angle, angle of attack, rotational speed; Propeller slip; Aerodynamic, centrifugal, and thrust forces; Torque; Relative airflow on blade angle of attack; Vibration and resonance. **Propeller Construction -** Construction methods and materials used in wooden, composite and metal propellers; Blade station, blade face, blade shank, blade back and hub assembly; Fixed pitch, controllable pitch, constant speeding propeller; propeller/spinner installation. **Propeller Pitch Control -** Speed control and pitch change methods, mechanical and electrical/electronic; Feathering and reverse pitch; Overspeed protection. **Propeller Design Features -** Constant speed operations and logic; Stabilizer offset; Engine axis offset; Power absorption
Teaching/Learning Methodology	Lectures are used to deliver the fundamental knowledge in relation to aircraft propellers (outcomes a to d). Tutorials are used to illustrate the applications of fundamental knowledge to practical situations (outcomes a to d).

	Teaching/Learning Methodology	Intended subject learning outcomes to be covered			
		a	b	c	d
	1. Lecture	✓	✓	✓	✓
	2. Tutorial	✓	✓	✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			
		a	b	c	d
1. Assignments / Quizzes	50%	✓	✓	✓	✓
2. Final examination	50%	✓	✓	✓	✓
Total	100 %				

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

Overall Assessment:

0.5 × Final Examination + 0.5 × Continuous Assessment

Examination is adopted to assess students on the overall understanding and the ability of applying the concepts. It is supplemented by continuous assessment including assignments and closed-book quizzes. The continuous assessment is aimed at enhancing the students' comprehension and assimilation of various topics of the syllabus.

Student Study Effort Expected		
	Class contact:	
	▪ Lectures	36 Hrs.
	▪ Tutorials	3 Hrs.
	Other student study effort:	
	▪ Assignments	20 Hrs.
	▪ Self-study	46 Hrs.
	Total student study effort	**105 Hrs.**

Reading List and References

1. Rodriquez, C.L., EASA Module 17A Propellers, Aircraft Technical Book Co., 2nd Edition.

2. Weick, F.E. Aircraft Propeller Design, McGraw-Hill Book Company, Inc. Latest Edition

	3. Kinney, J.R., Reinventing the Propeller. Aeronautical Specialty and the Triumph of the Modern Aircraft, Cambridge University Press, 2017

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