Subject Description Form

Subject Code	AAE4301
Subject Title	Avionics Systems
Credit Value	3
Level	4
Pre-requisite/ Co-requisite/ Exclusion	Nil
Objectives	To provide students with knowledge of communications, electronics aspects of avionics, including aircraft instruments and integrated systems, and navigation systems.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: a) understand the function and possess essential knowledge and skills the components of avionics systems. b) use the techniques, skills and modern computational and information technology necessary for engineering practice; and c) extend the knowledge of avionics systems to different situations of professional engineering context to communicate effectively and professionally with appropriate languages and tools in avionics system.
Subject Synopsis/ Indicative Syllabus	**Communications System:** the working principles of VHF radio, Datalink communication, Satellite communication, and etc. **Navigation System:** the working principles of NDB, VOR, DME, ILS, Satellite navigation, and etc. **Surveillance System:** the working principles of PSR, SSR, TCAS, ADS-B, and etc. **Air Data Computer:** the working principles of Pitot, Barometer and Machmeter, Air data instrument, and etc. **Inertial Navigation System:** Magnetometer, Gyroscope, Accelerometer, Gimbal and strapdown INS, Dead-reckoning.

Teaching/Learning Methodology

1. The teaching and learning methods include lectures/tutorial sessions.
2. Lectures are aimed at providing students with an integrated knowledge required for understanding fundamental concepts in guidance, navigation and advanced avionics systems. Theories and examples will be presented to cover the syllabus.
3. Tutorials are aimed at enhancing the analytical skills of the students. Examples will be provided to teach students the skills of designing advanced guidance laws and avionics systems. Students will be able to solve real-life problems using the knowledge they acquired in the class.

Teaching/Learning Methodology	Intended subject learning outcome		
	a	b	c
Lecture/Tutorial	✓	✓	✓

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed		
		a	b	c
1. Homework assignment	20%		✓	
2. Lab	10%	✓	✓	
3. Case study presentation	30%			✓
4. Examination	40%	✓	✓	
Total	100 %			

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

Overall Assessment:

$$0.40 \times \text{End of Subject Examination} + 0.60 \times \text{Continuous Assessment}$$

The continuous assessment consists of three components: homework assignments, lab and case study presentation. They are aimed at evaluating the progress of students study, assisting them in self-monitoring of fulfilling the respective subject learning outcomes, and enhancing the integration of the knowledge learnt.

The examination is used to assess the knowledge acquired by the students for understanding and analyzing the problems critically and independently; as well as to determine the degree of achieving the subject learning outcomes.

Student Study Effort Expected

Class contact:	
▪ Lecture/Tutorial	39 Hrs.
Other student study effort:	
▪ Self-Study	44 Hrs.

	▪ Case Study	22 Hrs.
	Total student study effort	105 Hrs.
Reading List and References	1. Helfrick A, Principles of Avionics, 9th Edition, Avionics Communications, 2015. 2. Tooley M, and Wyatt, Aircraft Electrical and Electronic Systems: Principles, Maintenance and Operation, Elsevier Ltd, 2009. 3. Collinson R.P.G., Introduction to Avionics Systems, Third Edition, Springer, Feb 2011. 4. Kayton Myron Walter R. Fried, Avionics Navigation Systems, Second Edition, John Wiley and Son, Published online 2007. 5. Pilot's Handbook of Aeronautical Knowledge, U.S. Department of Transportation, FAA, Flight Standards Service, 2008. 6. Advanced Avionics Handbook, U.S. Department of Transportation, FAA, Flight Standards Service, 2009. 7. Alexander V. Nebylov, Aerospace sensors, Momentum Press, 2013.	

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