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; and 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	**Regulatory Agencies & related documents -** ICAO Annex 10, F AA, RTCA; Concept of TSO; ARINC; DO-160. **Airborne Communications Systems -** VHF & HF transceivers, VDL modes; NAVCOM; EPIRB. **Terrestrial Radio Navigation & Landing Aids -** NDB; VOR; DVOR; DME; ILS & GP; Radar altimeters & AID. **Satellite Navigation -** Introduction to GNSS and its impacts on Performance-based navigation – RNAV & RNP. **Surveillance Systems -** Primary & Secondary Radars; ATCRBS replies; TCAS; ADS-B. **Cockpit Integration -** Display technologies; Instrument Placement. **On Board Data Buses -** ARINC 429; ARINC 629; ARINC 825 CAN Bus. **Electronic Flight Control -** FBW flight control features. Control laws. Safety and integrity. Redundancy and failure survival. Digital implementation and problems. Flight control software functions. **Case study -** Case study on an avionics system/avionics subsystem/avionics component

Teaching/Learning Methodology

1. The teaching and learning methods include lectures/tutorial sessions, homework assignments, test, case study report and examination.

2. The continuous assessment and examination are aimed at providing students with integrated knowledge required for avionics systems.

3. Technical/practical examples and problems are raised and discussed in class/tutorial sessions.

Teaching/Learning Methodology	Intended subject learning outcome to be covered		
	a	b	c
1. Lecture	✓	✓	
2. Tutorial	✓	✓	✓
3. Homework assignment	✓	✓	
4. Case study report	✓	✓	✓

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. Test	20%	✓	✓	
3. Case study report	20%			✓
4. Examination	40%	✓	✓	
Total	100 %			

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

Overall Assessment:

0.40 × End of Subject Examination + 0.60 × Continuous Assessment

The continuous assessment consists of three components: homework assignments, test, and case study report. 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.

Class contact:	
▪ Lecture/Tutorial	39 Hrs.

Student Study Effort Expected	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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