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 | 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. |
| | Surveillance Systems: Primary & Secondary Radars; ATCRBS replies; TCAS; ADS-B. |
| | Air Data Computer: Pitot tube, the principles and roles of ASI, VSI, barometer and machmeter. |
| | Intertial Navigation Systems: Magnetometer, gyroscope, accelerometer, artificial horizon. Gimbal and strapdown INS. Dead-reckoning. |
| | 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 including autopilot and flight management system. Case study: |
| | Case study on an avionics system/avionics subsystem/avionics component |

| 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. | | | | | | |
| The laboratory will provide the students with hand-on experience on instrumentation and measurement of physical variables such flight simulator or avionics trainer. Technical/practical examples and problems are raised and discussed class/tutorial sessions. | | | | | | |
| Teaching (Learning Methodology Intended subject learning outcom | | | | g outcome | | |
| | g/Learning Methodology | | | b | с | |
| | | - | | • | ✓ | |
| | | | | | ✓ | |
| - | | | | | | |
| 4. Case study report | | v | | ✓ | \checkmark | |
| Specific assessment methods/tasks | % weighting | | Intended subject learning outcomes to be assessed | | | |
| | | | а | b | С | |
| 1. Homework assignment | 20% | | | ✓ | | |
| 2. Lab Report | 10% | | ✓ ✓ | | | |
| 3. Case study report | 30% | | | | ~ | |
| 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. | | | | | | |
| | homework assignments, tr 2. The continuous assessments students with integrated k 3. The laboratory will provide instrumentation and meass simulator or avionics train 4. Technical/practical example class/tutorial sessions. Teaching/Learning Methodo 1. Lecture 2. Homework assignment 3. Laboratory 4. Case study report 3. Laboratory 4. Case study report 3. Case study report 3. Case study report 4. Examination Total Explanation of the appropriate intended learning outcomes: Overall Assessment: 0.40 × End of Subject The continuous assessment consistent study, assistent study, assistent study, assistent study, assistent study, assistent study, assistent study and analyzing to the study of the study of | homework assignments, test, cas2. The continuous assessment and a students with integrated knowled3. The laboratory will provide the s instrumentation and measurement simulator or avionics trainer.4. Technical/practical examples and class/tutorial sessions.Teaching/Learning Methodology1. Lecture2. Homework assignment3. Laboratory4. Case study reportSpecific assessment methods/tasks91. Homework assignment2. Lab Report1. Homework assignment2. Lab Report3. Case study report4. Examination4. Examination of the appropriateness of intended learning outcomes: Overall Assessment: 0.40 × End of Subject ExamThe continuous assessment consists assignments, test, and case study rep progress of students study, assisting respective subject learning outcomes knowledge learnt.The examination is used to assess th understanding and analyzing the pro | homework assignments, test, case study2. The continuous assessment and examin students with integrated knowledge req3. The laboratory will provide the student instrumentation and measurement of pl simulator or avionics trainer.4. Technical/practical examples and proble class/tutorial sessions.Teaching/Learning Methodology1. Lecture2. Homework assignment3. Laboratory4. Case study report4. Case study report5. Laboratory4. Case study report5. Laboratory4. Case study report6. Case study report7. Laboratory9. Labora | homework assignments, test, case study report an 2. The continuous assessment and examination are a students with integrated knowledge required for a 3. The laboratory will provide the students with han instrumentation and measurement of physical var simulator or avionics trainer. 4. Technical/practical examples and problems are ra class/tutorial sessions. Teaching/Learning Methodology 1. Lecture 2. Homework assignment 3. Laboratory 4. Case study report 5. Laboratory 4. Case study report 5. Specific assessment weighting 1. Homework assignment 2. Lab Report 3. Case study report 3. Case study report 4. Examination 4. Examination 5. Overall Assessment: 0.40 × End of Subject Examination + 0.60 × The continuous assessment consists of three component assignments, test, and case study report. They are aim progress of students study, assisting them in self-mom respective subject learning outcomes, and enhancing knowledge learnt. The examination is used to assess the knowledge acquired subject is a set of the problems critically a | homework assignments, test, case study report and examin 2. The continuous assessment and examination are aimed at 1 students with integrated knowledge required for avionics statuents with hand-on exp instrumentation and measurement of physical variables sursimulator or avionics trainer. 3. The laboratory will provide the students with hand-on exp instrumentation and measurement of physical variables sursimulator or avionics trainer. 4. Technical/practical examples and problems are raised and class/tutorial sessions. Teaching/Learning Methodology Intended subject learning 1. Lecture ✓ 2. Homework assignment ✓ 3. Laboratory ✓ 4. Case study report ✓ Specific assessment methods/tasks % weighting Intended subject I outcomes to be as a b 1. Homework assignment 20% 2. Lab Report 10% 3. Case study report 30% 4. Examination 40% ✓ Total 100 % ✓ 0.40 × End of Subject Examination + 0.60 × Continuo The continuous assessment consists of three components: hom assignments, test, and case study report. They are aimed at eva progress of students study, assisting them in self-monitoring or espective subject learning outcomes, and enhancing the integr | |

| Student Study | Class contact: | | | |
|--------------------------------|---|--|--|--|
| Effort Expected | 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 | Helfrick A, Principles of Avionics, 9th Edition, Avid Communications, 2015. Tooley M, and Wyatt, Aircraft Electrical and Ele Principles, Maintenance and Operation, Elsevier Ltd Collinson R.P.G., Introduction to Avionics Systems, Springer, Feb 2011. Kayton Myron Walter R. Fried, Avionics Naviga Second Edition, John Wiley and Son, Published onli Pilot's Handbook of Aeronautical Knowledge, U.S. Transportation, FAA, Flight Standards Service, 2008 Advanced Avionics Handbook, U.S. Department FAA, Flight Standards Service, 2009. Alexander V. Nebylov, Aerospace sensors, Momental | ionics, 9th Edition, Avionics craft Electrical and Electronic Systems: Operation, Elsevier Ltd, 2009. on to Avionics Systems, Third Edition, Fried, Avionics Navigation Systems, and Son, Published online 2007. utical Knowledge, U.S. Department of Standards Service, 2008. ook, U.S. Department of Transportation, ice, 2009. | | |

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