

COURSE INFORMATION

School/ Faculty:	School of Mechanical Engineering / Faculty of Engineering	Page:	1 of 5
Course code:	SEMT 4253	Academic Session/Semester:	20182019/1
Course name:	Aircraft Instrumentation and Avionics	Pre/co requisite (course name and code, if applicable):	Electronics (SKEU 2012)
Credit hours:	3		

Course synopsis	Aircraft Instrumentation and Avionics course provides the understanding of various basic instrument and electronics used in aircraft. The major topics cover includes an introduction to instrumentation system, component of instrumentation, air data, calibration equations, gyroscopes, indicators, signal conditioning, data acquisition system, transducers, Introduction to avionics and GPS application. The devices that will be thought such as ADF, VOR, DME, LORAN C, ILS, RADAR Altimeter, GPS and Primary RADAR. It is a blended course that combines traditional teaching methods to Problem-Based Learning (PBL) approach based on real problems in aircraft instrumentation and avionics, which also comprising The Fourth Industrial Revolution (<i>IR 4.0</i>) element.			
Course coordinator (if applicable)	Prof. Ir. Dr. Wan Khairuddin bin Wan Ali			
Course lecturer(s)	Name	Office	Contact no.	E-mail
	Prof. Ir. Dr. Wan Khairuddin bin Wan Ali	Aerolab, P20	Ext. 35844	wankhai@utm.my
	Dr. Mastura binti Ab Wahid	C23-310	Ext. 32642	masturawahid@utm.my

Mapping of the Course Learning Outcomes (CLO) to the Programme Learning Outcomes (PLO), Teaching & Learning (T&L) methods and Assessment methods:

No.	CLO	PLO (CODE)	*Taxonomies and **generic skills	T&L methods	***Assessment methods
CLO1	Outline the history, regulatory advisory agencies, air data system.	PLO1 (KW)	C4	Lecture, Discussion	T
CLO2	Derive from the first principle equation(s) used in air data system	PLO4 (THI)	C5	Lecture, Discussion	F
CLO3	Solve instrumentation and Avionics problems using Labview.	PLO5 (SCMT)	C4	Lecture, Discussion	T, PR
CLO4	Solve the problem of interface circuits and noise.	PLO2 (THPA)	C4	Lecture, Discussion	T, F

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CLO5	Outline the working principle of navigation system.	PLO1 (KW)	C4	Lecture, Discussion	F, PR
CLO6	Communicate through writing and submitting reports on avionics project.	PLO9 (CS), PLO10 (TW), PLO11 (SC)	A4 (CS1, TW1, SC1)	Lecture, Discussion	PR
Refer *Taxonomies of Learning and **UTM's Graduate Attributes, where applicable for measurement of outcomes achievement ***T – Test; Q – Quiz; ASG– Assignment; HW – Homework; PR – Project; Pr – Presentation; F – Final Exam etc.					

Details on Innovative T&L practices:

No.	Type	Implementation
1.	Project-based learning	Conducted through design assignments. Students in a group of 3 or 4 are given project that requires students to solve LabView Problem. Compliance to the design specifications need to be given in the form of written reports.

Weekly Schedule:

Week 1	Introduction to Aircraft Instrumentation History, Aircraft minimum instrument, Regulatory Advisory Agencies Air Data System and Standard Atmosphere
Week 2	Pitot-Static System and System of height measurement Airspeed measurement Outside Air Temperature measurement
Week 3	Introduction to Mechanical Gyroscope Mechanical Gyroscope Laser Gyroscope
Week 4	Indicators and Data Acquisition System, Description of Measuring Instrument Performance of Instrument
Week 5	Aircraft Instrument, Transducers and sensors Op-amp circuits

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	Amplifier and Sensor
Week 6	Interfacing circuits Circuits with Arithmetic function part 1 Circuits with Arithmetic function part 2
Week 7	Noise studies Introduction to LabView LabView – Virtual Instrument
Week 8	MID SEMESTER BREAK
Week 9	LabView – MathScript LabView – Editing and Debugging Virtual Instrument LabView – Sub VIs
Week 10	LabView - Structures LabView – Array and Clusters LabView – Chart and Graph
Week 11	LabView Programming NDB and ADF part 1 NDB and ADF part 2
Week 12	VOR and DME part 1 VOR and DME part 2 OMEGA System
Week 13	LORAN-C ILS part 1 ILS part 2
Week 14	MLS part 1 MLS part 2 Global Positioning System
Week 15	Introduction to Primary Radar Radar Altimeter Revision

Transferable skills (generic skills learned in course of study which can be useful and utilised in other settings):

Team working, Written communication

Student learning time (SLT) details:

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Signature:	Signature:
Date:	Date:

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Distribution of student Learning Time (SLT) Course content outline	Teaching and Learning Activities						TOTAL SLT
	Guided Learning (Face to Face)				Guided Learning Non-Face to Face	Independent Learning Non-Face to face	
CLO	L	T	P	O			
CLO 1	2h					5h	7h
CLO 2	5h					8h	13h
CLO 3	9h					11h	20h
CLO 4	13h					17h	30h
CLO 5	13h					17h	30h
CLO 6						4h	4h
Total SLT	42h					62h	104h

Continuous Assessment		PLO	Percentage	Total SLT
1	Test 1	PLO1 (KW), PLO4 (THI)	20	2h
2	Test 2	PLO1 (KW), PLO2 (THPA)	20	2h
3	Project 1	PLO1 (KW), PLO9 (CS), PLO10 (TW), PLO11 (SC)	20	5h
4	LABVIEW Project	PLO2 (THPA)	10	5h
Final Assessment			Percentage	Total SLT
1	Final Examination	PLO1 (KW), PLO2 (THPA),	30	2h
Grand Total			100	120h

L: Lecture, T: Tutorial, P: Practical, O: Others

Special requirement to deliver the course (e.g: software, nursery, computer lab, simulation room):

Modern Tool

Learning resources:

Textbook - Advanced Avionics Handbook (FAA-H-8083-6), U. S. Department of Transportation and Federal Aviation Administration, Jun 11, 2013 - Principles of Avionics, Albert Helfrick, 8th edition, Avionics Communications Inc., 2013. - Aircraft, Electricity and Electronics', Thomas K. Eismen, Fifth Edition, GLENCOE, Macmillan/McGraw-Hill, New York, 1994
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4. Introduction to Mechatronics and Measurement System', D.G.Alciatore and M.B.Histand, 2nd Ed. McGraw-Hill, New York, 2002

Online

<http://elearning.utm.my>

Academic honesty and plagiarism: (Below is just a sample)

Assignments are individual tasks and NOT group activities (UNLESS EXPLICITLY INDICATED AS GROUP ACTIVITIES) Unless allowed by the Lecturer, copying of work (texts, simulation results etc.) from other students/groups or from other sources is not allowed. Brief quotations are allowed and then only if indicated as such. Existing texts should be reformulated with your own words used to explain what you have read. It is not acceptable to retype existing texts and just acknowledge the source as a reference. Be warned: students who submit copied work will obtain a mark of **zero** for the assignment and disciplinary steps may be taken by the Faculty. It is also unacceptable to do somebody else's work, to lend your work to them or to make your work available to them to copy.

Other additional information (Course policy, any specific instruction etc.):

ATTENDANCE The student should adhere to the rules of attendance as stated in the University Academic Regulation :-

- Student must attend not less than 80% of lecture hours as required for the subject.
- The student will be prohibited from attending any lecture and assessment activities upon failure to comply the above requirement. Zero mark will be given to the subject.

Disclaimer:

All teaching and learning materials associated with this course are for personal use only. The materials are intended for educational purposes only. Reproduction of the materials in any form for any purposes other than what it is intended for is prohibited.

While every effort has been made to ensure the accuracy of the information supplied herein, Universiti Teknologi Malaysia cannot be held responsible for any errors or omissions.

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