Cairo University
Faculty of Engineering

Aerospace

Engineering Department

Course Specifications

Program(s) on which this course is given:	M.Sc. in Aerospace Engineering
Department offering the program:	Aerospace Department
Department offering the course:	Aerospace Department
Academic Level:	PhD.
Date	2nd term
Semester (based on final exam timing)	☐ Fall ☐ Spring

A- Basic Information

1. Title:	**Systems and measurement instruments in flying vehicles**		**Code:**		**AER 791**			
2. Units/Credit hours per week:	Lectures	3	Tutorial		Practical		Total	3

B- Professional Information

1. Coursedescription:	This course deals with the following main topics: Advanced study on operation control, processing of continuous signals and discrete signals, thermal, mechanical, electromagnetic carriers, fine control, principles of controllers, analogue controllers, digital controllers, characteristics of control circuit, application of central processor with measurement instruments, flying vehicle systems, hydraulic gaseous and electric systems,
2. Intended Learning Outcomes of Course (ILOs):	**a) Knowledge and Understanding**
	Students will be conversant with measurement techniques and the use of measuring instruments
	Students will have working knowledge for dealing with problems involving control system fundamentals
	b) Intellectual Skills
	Troubleshoot & rectify faulty Instruments
	Evaluate and select of: instrumentation, and sensors, requirements of different system of aircraft.
	c) Professional and Practical Skills
	Work in control room in process Industries
	Design new control systems
	d) General and Transferable Skills
	Identify and explain the roles of : different controller of aircraft

3. Contents

Topic	Total hours	Lectures hours	Tutorial/ Practical hours
Introduction to process control	3	3	
continuous signals processing,	2	2	
digital signals processing	2	2	
optical, mechanical, and thermal signals	4	4	
principles of continuous or analogue controllers.	3	3	

principles of digital controllers	3	3	
characteristics of control circuit	3	3	
flying vehicle Hydraulic systems.	3	3	
flying vehicle Electric Power Systems.	4	4	
flying vehicle Systems troubleshooting	4	4	
4. Teaching and Learning Methods	Lectures (27)	Practical Training/ Laboratory (15)	Seminar/Workshop (4)
	Class Activity (4)	Case Study 2)	Projects (1)
	E-learning (5)	Assignments /Homework (6)	Other:

5. Student Assessment Methods	
• **Assessment Schedule**	**Week**
-Assessment 1;Class test	4
-Assessment 2; Project Assignment	6,,9,13
-Assessment 3; Presentations	3,5,7, 10, 12
-Assessment 3; Midterm Exam	8
-Assessment 4; Final Exam	16
• **Weighting of Assessments**	
-Mid-Term Examination	10
-Final-term Examination	70
-Project	5
-Class Test	1
-Presentation	4
-Total	100

6. List of References

Handouts and presentation slides prepared by the instructors.

Aircraft Design: Synthesis and Analysis, Ilan Kroo. (2011)

Aircraft Maintenance & Repair, Mckinley, J.L. and Bent R.D., McGraw Hill

Handbook of Instrumentation- Process Control, B.G. Liptak

Introduction to process Control' , Jose A. Romagnoli, Ahmet Palazoglu, (CRC Tylor and Francis group)

Aircraft Systems Mechanical, electrical, and avionics subsystems integration, Ian Moir, Allan Seabridge, Professional Engineering Publishing Limited, 2001

7. Facilities Required for Teaching and Learning

Lecture room equipped with computer and data show.
Whiteboards.
Textbook available in the department library.

Course Coordinator:	Prof. Mohamed Sayed Bayoumi
Head of Department:	Prof. Ayman hamdy Kassem