Cairo University
Faculty of Engineering

Department of Electronics and Electrical Communications Engineering

Course Specifications

Program(s) on which this course is given:	Aerospace Engineering
Department offering the program:	Aerospace Engineering Department
Department offering the course:	Aerospace Engineering Department
Academic Level:	Master or Ph.D.
Date	
Semester (based on final exam timing)	☑ Fall ☐ Spring

A- Basic Information

1. Title:	Experimental Methods in Aerodynamics			**Code:**	**AER615**			
2. Units/Credit hours per week:	Lectures	1	Tutorial	0.5	Practical	0.5	Total	3

B- Professional Information

1. Course description:	Students should understand the basic types of wind tunnels, measurement systems and instrumentations, methods of calibration and measurement of response time and deviation, sources of measurement errors, method of error analysis, statistical method for analysis of experimental data, measurement of speed, temperature, density, humidity, air flow, turbulence, method for flow visualization, method for deign of experiments, measurement of force and moments, correction of measurement error in wind tunnels, data acquisition system, process in data in data acquisition system and reporting of experimental data.
2. Intended Learning Outcomes of Course (ILOs):	**a) Knowledge and Understanding**
	Introduce types or aerodynamics test facilities
	Statistical analysis of experimental data
	b) Intellectual Skills
	Understanding the principles and working of experimental methods
	Appreciate the strength and weakness of experimental methods in aerodynamics
	c) Professional and Practical Skills
	Demonstrate the ability of using technology in experimental aerodynamics
	d) General and Transferable Skills
	Design and develop experimental setups
	Conduct oral presentation and report writing

3. Contents

Topic	Total hours	Lectures hours	Tutorial/ Practical hours
Introduction and basic concepts	3	2	1
Statistical analysis of experimental data	6	4	1
Basic types of wind tunnels and wind tunnel designs	6	4	1
Measurement techniques of primary quantities (Velocity, Pressure, Temperature, Strain)	6	4	1
Measurement of force and moments	3	2	1

Flow visualization technique	6	4	1
Correction of wind tunnel data	3	2	1
Design of Experiments (DOE	6	4	1
Introduction to data acquisition systems and processing	3	2	1
Reporting of experimental data	3	2	1
4. Teaching and Learning Methods	Lectures (✓)	Practical Training/ Laboratory (✓)	Seminar/Workshop (✓)
	Class Activity ( )	Case Study ( )	Projects (✓)
	E-learning (✓)	Assignments /Homework (✓)	Other:

5. Student Assessment Methods	
• **Assessment Schedule**	**Week**
-Assessment 1; Class test	
-Assessment 2; Project Assignment	3
-Assessment 3; Presentations	15
-Assessment 3; Midterm Exam	Not applicable
-Assessment 4; Final Exam	After week 15
• **Weighting of Assessments**	
-Mid-Term Examination	-
-Final-term Examination	50
-Project	20
-Class and Laboratory work	25
-Presentation	5
-Total	100

6. List of References

1. Experimental methods for Engineers, J. P. Holman, 6th Ed.
2. Low Speed Wind Tunnel Testing, B. Barlow, William H. Rae, and Alan Pope
3. High Speed Wind Tunnel Testing, B. Barlow, William H. Rae, and Alan Pope
4. Hand Book of Experimental Fluid Mechanics, Cameron Tropea, Alexander L. Yarin, and John F. Foss
5. Fluid Mechanics Measurement, R. Goldstein, 2nd Ed.
6. Handouts

7. Facilities Required for Teaching and Learning

- Aerodynamics Laboratory
- LMS (Moodel site)
- Projector

Course Coordinator:	Mohammed Khalil Ibrahim
Head of Department:	