Course Specifications

Program(s) on which this course is given:	M.Sc. Aerospace Engineering
Department offering the program:	**Aerospace Engineering**
Department offering the course:	**Aerospace Engineering**
Academic Level:	Graduate: MSc, Level 6
Date	April 2015
Semester (based on final exam timing)	■ Fall ☐ Spring

A- Basic Information

1. Title:	Advanced Aerodynamics			**Code:**		**AER610**		
2. Units/Credit hours per week:	Lectures	2	Tutorial	0	Practical	**0**	Total	2

B- Professional Information

1. Course description:	This course extends fluid mechanics concepts to the aerodynamic performance of wings and bodies in subsonic regimes.
2. Intended Learning Outcomes of Course (ILOs):	**a) Knowledge and Understanding**
	Review various forms of fluid mechanics equations
	Identify and describe various terms in the equations and relate to fluid phenomena
	b) Intellectual Skills
	Apply simplifying assumptions to the governing equations in order to reduce complexity
	Categorize and analyze solved problems in fluid mechanics / aerodynamics
	Solve problems of inviscid incompressible flow over 2D airfoil and 3D wing

3. Contents

Topic	**Total hours**	**Lectures hours**	**Tutorial/ Practical hours**
Introduction, Tools and Governing Equations	4	4	
Simplifying Assumptions and Famous Fluid Flow Models	3	3	
Problem Solving and Selected Applications	4	4	

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; Classwork: Attendance	1 to 11
-Assessment 2; Homework: Problems	1, 4, 6
-Assessment 3; Classwork: Presentation	10, 11
-Assessment 4; Midterm Exam	5
-Assessment 5; Final Exam	12
• **Weighting of Assessments**	
-Assessment 1; Classwork: Attendance	8
-Assessment 2; Homework: Problems	7
-Assessment 3; Classwork: Presentation	7
-Assessment 4; Midterm Exam	8
-Assessment 5; Final Exam	70
-Total	100 %

6. List of References

- **Course Notes**

Handwritten and Typed

- **Essential Text Book**

Fluid Mechanics, Granger, R.A., Dover, 1995

- **Recommended Books**

Fluid Mechanics 7th Ed, White, F.M., McGraw-Hill, 2011

Aerodynamics for Engineers 5th Ed, Bertin, J.J., Cummings, R.M., Pearson Prentice Hall, 2009

Fluid Mechanics – Problems and Solutions, Spurk, J.H., 1997

Boundary Layer Theory 8th Ed, Schlichting, H., Gersten, K., Springer, 2004

7. Facilities Required for Teaching and Learning

Tablet and Projector

Course Coordinator:	Assist. Prof. / Hesham Mahmoud AbdelRehim Elbanna
Head of Department:	Prof. Dr. Ayman Hamdy Mohamed Kassem