



### Course Specifications

Program(s) on which this course is given:	B.Sc. Aerospace Engineering
Department offering the program:	Aerospace Engineering
Department offering the course:	Aerospace Engineering
Academic Level:	1 <sup>st</sup> Year
Date	2014/2015
Semester (based on final exam timing)	<input type="checkbox"/> Fall <input type="checkbox"/> Spring

### A- Basic Information

1. Title:	Analysis of Structures			Code: AER103A				
2. Units/Credit hours per week:	Lectures	2	Tutorial	1	Practical		Total	3

### B- Professional Information

1. Course description:	
2. Intended Learning Outcomes of Course (ILOs):	<b>a) Knowledge and Understanding</b>
	1- Know disciplines of aircraft design
	2- Know stages of structural design and analysis
	3- Know basic parts of aircraft
	4- Know various loads affecting aircraft
	5- Know the different stresses caused by internal loads
	6- Know when materials are fractured
	7- Know that deformation is due to strain
	<b>b) Intellectual Skills</b>
	1- Calculate external reactions and internal loads
	2- Calculate the degree of redundancy of a structure
	3- Calculate Internal loading distribution along beam and frame structures
4- Transformation stresses and strains versus axes orientation	
5- Calculate maximum stresses and strains	
6- Calculate strength margin of safety	
7- Handle experimentally measured strains	
8- Calculate strains from stresses and vice versa	
<b>c) Professional and Practical Skills</b>	
1- Understand that structures are flexible and not rigid	
2- Understand the concept of external and internal equilibrium	
3- Understand the concept of strain	
4- Understand how a material strains when stressed	
<b>d) General and Transferable Skills</b>	

### 3. Contents

Topic	Total hours	Lectures hours	Tutorial/ Practical hours
Introduction	4	2	0

Analysis Of Force System	10	3	2
Analysis of Plane Trusses	8	2	2
Straining Actions on Beams	10	3	2
The Nature of Stress and Strain	12	4	2
<b>4. Teaching and Learning Methods</b>	Lectures (✓)	Practical Training/ Laboratory ()	Seminar/Workshop ()
	Class Activity (✓)	Case Study (✓)	Projects ()
	E-learning ()	Assignments /Homework (✓)	Other:
<b>5. Student Assessment Methods</b>			
• <b>Assessment Schedule</b>		<b>Week</b>	
-Assessment 1		2	
-Assessment 2		6	
-Assessment 3		11	
-Assessment 3; Midterm Exam		14	
-Assessment 4; Final Exam		16	
• <b>Weighting of Assessments</b>			
-Mid-Term Examination		15%	
-Final-term Examination		70%	
-Project			
-Class Work		15%	
-Presentation			
-Total		100%	
<b>6. List of References</b>			
H. M. Negm, Structural Analysis, lecture notes on Analysis of Structures, Aerospace Engineering Department, Faculty of Engineering, Cairo University, 199?. (Concise with sufficient explanations and examples)			
D. J. Peery, Aircraft Structures, Dover Publications, Inc., 2nd ed., 2011 (Classical and popular. Identical to the 1st edition of 1950. Covers many parts of aircraft structures courses of this department)			
R. C. Hibbeler, Statics, Pearson Prentice Hall, 13th ed., 2013. (Good. Covers 1st term. Different organization than this course. Good figures. Good in Straining Action Diagrams (chapter 6).)			
R. C. Hibbeler, Mechanics of Materials, Pearson Prentice Hall, 8th ed., 2010. (Good. Covers 1st year. Different organization than this course. Good figures. Also sec. 11.3 Fully stressed Beams)			
B. K. Donaldson, Analysis of Aircraft Structures- An Introduction, Cambridge University Press, 2nd ed., 2008. (Brief with few examples. Covers much of the aircraft structures courses of this department)			
T.H.G. Megson, Aircraft structures for engineering students, Elsevier Ltd., 4th ed., 2007. (Brief with few examples. Covers much of the aircraft structures courses of this department)			
<b>7. Facilities Required for Teaching and Learning</b>			
.projector and white board			
<b>Course Coordinator:</b>	<b>Dr.Ahmed Mohamed Rashed</b>		
<b>Head of Department:</b>	<b>Dr.Ayman Hamdy</b>		