Cairo University
Faculty of Engineering

Department of Aerospace Engineering

Course Specifications

Program(s) on which this course is given:	Aerospace Engineering
Department offering the program:	**Aerospace Engineering**
Department offering the course:	**Aerospace Engineering**
Academic Level:	Ph.D
Date	March 2015
Semester (based on final exam timing)	☐ Fall ☐ Spring

A- Basic Information

1. Title:	Reliability based structure design.			**Code:**	AER 732			
2. Units/Credit hours per week:	Lectures	2	Tutorial	1	Practical		Total	3

B- Professional Information

1. Course description:

Structural reliability is a major topic in the different fields of structural design. In aerospace Engineering where the minimum weight design is a basic requirement, this topic becomes of an extreme importance.

2. Intended Learning Outcomes of Course (ILOs):

a) Knowledge and Understanding

Understanding and application of the various techniques used in the study of structure reliability.

Assessment and computation of the structure reliability.

b) Intellectual Skills

Analysis and Problem solving

c) Professional and Practical Skills

Manage , engineering design , computer programming and ability to identify the problem

d) General and Transferable Skills

Solve structure reliability problems and working in group.

3. Contents

Topic	Total hours	Lectures hours	Tutorial/ Practical hours
Basics, Measures and assessment of structural reliability. Commonly used probability distributions.	10	7	3
Fundamentals of reliability analysis. Integration and simulation methods.	9	7	2
Second-moment and transformation methods.	6	4	2
Reliability of structural systems. Time dependent reliability.	8	6	2
Probabilistic evaluation of existing structures.	6	4	2
Structures under dynamic loading.	6	4	2

4. Teaching and Learning Methods	Lectures (x)	Practical Training/ Laboratory (x)	Seminar/Workshop (x)
	Class Activity	Case Study (x)	Projects ( )

	(x)		
	E-learning (x)	Assignments /Homework (x)	Other:
5. Student Assessment Methods			
• **Assessment Schedule**		**Week**	
-Assessment 1; Class test		3, 6, 10, 13	
-Assessment 2; Project Assignment		14	
-Assessment 3; Presentations		7,14	
-Assessment 3; Midterm Exam		8	
-Assessment 4; Final Exam		15	
• **Weighting of Assessments**			
-Mid-Term Examination		10 %	
-Final-term Examination		70 %	
-Project		10 %	
-Class Test		5 %	
-Presentation		5 %	
-Total		100 %	
6. List of References			
Structural reliability analysis and prediction. R.E.Melchers, John Wiley.			
Reliability assessment using stochastic finite element analysis. A. Halder and S. Mahadevan, John Wiley.			
7. Facilities Required for Teaching and Learning.			
Computer Lab, Data show, software.			
Course Coordinator:	**Prof. Edward A. Sadek**		
Head of Department:			