



Philadelphia University
Faculty of Engineering
Department of Architecture
1st semester, 2009/2010

Course Syllabus

Course Title: Structural Mechanics and Analysis	Course code: 660225
Course Level: 1	Course prerequisite (s) and/or corequisite (s): 210106
Lecture Time: 10-11 or 11-12	Credit hours: 3

Academic Staff

Specifics

Name	Rank	Office Number and Location	Office Hours	E-mail Address
Balqies Sadoun-Obaidat	Full professor	E06408	6 Hours weekly	balqiessadoun@Yahoo.com

Course module description:

Introduce students to the Force vectors, Force system resultants, Equilibrium of a rigid body, Structural analysis, Geometric properties and distributed loadings and internal loading. It provides them as well, with the knowledge of the mechanics of materials to include the stress and strain, Mechanical properties of materials, Axial load , Torsion, Bending , Transverse Shear, Combined loadings, Stress and strain transformation, Design of beams and Buckling of Columns.

Course module objectives:

- 1- To introduce students to force vector and their equilibrium to understand the effect of loading in the buildings.
- 2- To transfer students cognitive and imaginative thinking to visualize the needed structures to hold the different loading systems.
- 3- To upgrade students abilities to distinguish between different structural loadings and their points of weakness.
- 4- To provide students with means to analyze different structures and to choose the best system for their designs.

Course/ module components

The course consists of tow parts:

- 1- **Statics**
- 2- **Mechanics of Materials and Structural analysis**

The main purpose of this course is to provide the students with a clear and thorough understanding of the theory and the applications of the Statics and the engineering

mechanics of materials. This will allow the creation of their structural designs and improve the livability of their architectural creations.

- **Books (title , author (s), publisher, year of publication)**

R. C. Hibbeler, "Statics & Mechanics of Materials © 2007 Pearson Education South Asia Pte Ltd. Last updated on 27 October 2006. ISBN 13: 978-013-129-011-2 and ISBN 10 : 013-129-011-8

- **Support material:** Students are advised to read and solve problems from any book about statics, strength of materials and structures.

- **Homework:** students are requested to solve specific number of problems as home works.

Teaching methods:

Lectures will be presented to students twice a week. A problem session will be held at every third meeting to collect the home work and solve it on the board.

Learning outcomes:

- Knowledge and understanding

The course will build the student ability to understand the acting forces, their points of application, equilibrium and resultant. Then it will create an understanding of the internal action of the applied forces on the structural material (stresses) and the resulting strains.

- Communication skills (personal and academic).

The Architectural students will be able to design communicate, read, use resources (books, magazine, web sites, etc.) related to the structures of buildings, interpret and explain their designs.

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- Practical and subject specific skills (Transferable Skills).

The course will train architectural students and qualify them to analyze loading in structures, and to understand the internal stresses and strains. Then choosing the structures and their materials will be provided by the concrete or steel design course. Then this course is the base for a practical design.

Assessment instruments

- According to the following table:

<u>Allocation of Marks</u>	
Assessment Instruments	Mark
Year work and attendance	%20
First Exam	%20
Second Exam	%20
Final Exam	%40
Total	%100

Documentation and academic honesty

- Students are requested to illustrate references whatever extracted from books, magazine or web sites, in order to respect the copyright protection and avoid plagiarism.

Course/module academic calendar

The class meets Sunday, Tuesday and Thursday from 10-11 or from 11-12

Subject	Week	Homework/ due dates
- Force vectors	(1)	
- Force system resultants	(1)	
- Equilibrium of a Rigid body	(1)	
- Structural Analysis	(1)	
- Geometric Properties and Distributed Loadings	(1)	
- Internal Loading.	(1)	
-	First examination	
- stress and strain	(1)	
- Mechanical properties of materials	(1)	
- Axial load	(1)	
- Torsion	(1)	
- Bending	(1)	
- Transverse Shear	(1)	
-	Second examination	
- Combined loadings	(1)	
- Stress and Strain Transformation	(1)	
- Design of Beams	(1)	
- Buckling of Columns	(1)	
	Final Examination	

Expected workload:

On average students need to spend 10 hours weekly as a minimum to be able to solve the required problems.

Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/Faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

Module references

Books

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