

General Information:

Name of the Course:
Course Code:

Structural Engineering Softwares “I”
PMTSTNB100CA

Semester: 2nd
Number of Credits: 2
Allotment of Hours Per week: (1 Lecture + 1 Practice)/ Week

Evaluation: Midterm + 2nd Midterm

Prerequisites: Reinforced Concrete Structures Design (BSc), Steel Structures Design (BSc), Finite Elements Knowledge (BSc),

Instructor: **Mohamad AL MAWALI, Assistant Lecturer**
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Introduction, Learning Outcomes:

The Structural Engineering Softwares-I Course will provide for the students the basic knowledge about the roles of the computer programs of structural engineering in the contribution of the designing and the calculation, and the knowledge of the usage of those programs and the most important ones of them around the world currently.

Upon successful completion of this course, the student will be able to know and understand:

- 1- What is a structural engineering software and how does it work
- 2- The basics of the usage of the structural engineering computer programs
- 3- The Applying of the previous mentioned points on the Autodesk Robot Structural Analysis Professional Software
- 4- What is Autodesk RSA and how does it work and what are its main majors
- 5- Opening an RSA file and set its settings and preferences
- 6- Calculate and Analyze Reinforced Concrete Structures using the software
- 7- Design of Reinforced Concrete Structures using the software
- 8- Calculate and Analyze Steel Structures using the software
- 9- Design of Steel Structures using the software
- 10- Final Report making for the calculation and the design
- 11- In-Connecting between the Autodesk RSA software and the BIM tools

Requirements for Completion: This course will include about 14 Lessons of the previous mentioned points. The students will have to bring their own computers along with the using of the universities computers of course, the home-weekly-applying is required from the students always.

Slides and documents will be provided for students, however it's important for a student to write down in the lecture and take his own notes and follow up with the lecturer, And at the end of the course.

The materials of the course will be the documents from the instructor, and some handmade calculations by him as well and the official Eurocodes Standards.

In order to take this course, you must: Have access to a computer, frequent broadband Internet access, and ability to download and save files and documents to a computer. Using your personal code, all of the computer skills are available in the course room: PTE MIK, A-102.

The license to the software for the students can be got with a student account in the website of Autodesk company.

You will also need to complete a graded **Midterm Test** and a **Second Midterm Test**.

In case of improvement needed for the mark: there could be a **Final (Retake) Test**, but it will include the whole semester's topics

Schedule:

This course measures students' progress in meeting the above objectives by requiring them to:

- Follow up with a design project during the whole semester at their lessons and to apply after the tutor step by step
- Provide the reports of each week's working in their projects (Weekly check)
- It's obligatory for a student with a Graduation Diploma Works in Structural Engineering Topics to use what's been learned in this course and to apply it there

Lectures Titles:

- 1- Week-1: Introduction and Syllabus's Explaining and how to dedicate this course for the benefits of the diploma works and the graduation projects
- 2- Week-2: Introduction to the Structural Engineering Softwares and the most common of them around the world, Discussing the In-Classes-Project
- 3- Week-3: Introduction to Autodesk Robot Structural Analysis Professional, Setting a new file
- 4- Week-4: Building and Modelling for an RC Structure in Autodesk RSA – Part (1)
- 5- Week-5: Building and Modelling for an RC Structure in Autodesk RSA – Part (2)
- 6- Week-6: Loading and Analyzing the Model
- 7- Week-7: RC Model Design
- 8- Week-8: Building and Modelling for a Steel Structure
- 9- Week-9: Midterm Test
- 10- Week-10: Spring Break
- 11- Week-11: Analyzing and Loading the Steel Model
- 12- Week-12: Steel Model Design
- 13- Week-13: Exporting and Connecting between Autodesk RSA and BIM Tools
- 14- Week-14: Second Midterm
- 15- Week-15: Final Retakes if needed

Continuous learning of students is controlled two times during the semester. Therefore, two parts is distinguished and controlled:

- **First Part** of the semester content is eight lectures, starting from the first week until the eight, this part will be ended by a midterm test in the ninth week including the topics of the first seven weeks only
- **Second Part** of the semester starts from the 11th week until the 13th, it will be ended in the 14th week with a second midterm, and the retake will be in the 15th week ONLY IF NEEDED, and the topics of the retakes will be the whole course

Methodology:

The course is based on individual computational skills with regular consultations and presentations.

Studio Culture:

The course is based on through collaboration, participation and discussions trough lessons. This is an interaction between Students and Faculty; used the teaching methods like 'Problem-based learning' and 'learning-by-doing'. The communication and work should be reflect a respect for fellow students and their desire to work with regard to noise levels, noxious fumes, etc – from each site of participants.

Attendance:

Attending is required all classes, and will impact the grade (max. 10%). Unexcused absences will adversely affect the grade, and in case of absence from more than 30% of the total number of lesson will be grounds for failing the class. To be in class at the beginning time and stay until the scheduled end of the lesson is required, tardiness of more than 20 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

Evaluation and Grading:

Grading will follow the course structure with the following weight:

- Attendance & Participation = 20%
- 1st Midterm = 40%
- Oral Test and an Interview along with the design project = 40%

And in case of a Retake Exam, its mark will be a replacement mark for both of the previous mentioned midterms.

Grading Scale:

Numeric Grade:	5	4	3	2	1
Evaluation in points:	89% - 100%	77% - 88%	66% - 76%	55% - 65%	0% - 54%

5. Outstanding work. Execution of work is thoroughly complete and demonstrates a superior level of achievement overall with a clear attention to detail in the production of drawings, models and other forms of representation. The student is able to synthesize the course material with new concepts and ideas in a thoughtful manner, and is able to communicate and articulate those ideas in an exemplary fashion in.

4. High quality work. Student work demonstrates a high level of craft, consistency, and thoroughness throughout drawing and modelling work. The student demonstrates a level of thoughtfulness in addressing concepts and ideas, and participates in group discussions. Work may demonstrate excellence but less consistently than an '5' student.

3. Satisfactory work. Student work addresses all of the project and assignment objectives with few minor or major problems. Graphics and models are complete and satisfactory, exhibiting minor problems in craft and detail.

2. Less than satisfactory work. Graphic and modelling work is substandard, incomplete in significant ways, and lacks craft and attention to detail.

1. Unsatisfactory work. Work exhibits several major and minor problems with basic conceptual premise, lacking both intention and resolution. Physical representation in drawing and models is severely lacking, and is weak in clarity, craft and completeness.

Students with Special Needs:

Students with a disability and needs to request special accommodations, please, notify the Deans Office. Proper documentation of disability will be required. All attempts to provide an equal learning environment for all will be made.

Readings and Reference Materials:

Official Autodesk Company Website, for the offline help of the software, as an official copy.