## Faculty of Engineering & Technology

## Structural Mechanics 3

**Information :**

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| **Course Code :** | SCM 411 | **Level :** | Undergraduate | **Course Hours :** | 3.00- Hours |

**Department :** Department of Structural Engineering & Construction Management

**Instructor Information :**

| Title | Name | Office hours |
|---|---|---|
| Lecturer | Dina Muhammad Fathy Ors | 28 |
| Teaching Assistant | Ahmed Taher Abdelhamed Mohamed Yousef | |
| Teaching Assistant | Ahmed Salah Rashad Ahmed Abdelhakk | |

**Area Of Study :**

ÅAt the end of this course, students will be able to: 1. Constitute the stiffness matrix of the structure elements in their local coordinates 2. Write force equilibrium equations at the joints of the structure 3. Assemble the overall stiffness matrix of the structure in the global axes 4. Calculate the internal forces in the statically indeterminate structure

**Description :**

Matrix analysis of structures: flexibility method, stiffness method, Applications on all types of plane and space skeletal structures

**Course outcomes :**

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| **a.Knowledge and Understanding: :** | |
| 1 - | Understand basic concepts of structural modeling. |
| 2 - | Identify Techniques of solving different types of statically indeterminate plane and space structures. (Stiffness Method |
| **b.Intellectual Skills: :** | |
| 1 - | Constitute the stiffness matrix of the structure elements in their local coordinates |
| 2 - | Write force equilibrium equations at the joints of the structure |
| 3 - | Assemble the overall stiffness matrix of the structure in the global axes |
| 4 - | Calculate the internal forces in the statically indeterminate structure |
| **c.Professional and Practical Skills: :** | |
| 1 - | Ability to handle different types of structures |
| 2 - | Ability to handle different structural systems |
| 3 - | Apply knowledge of mathematics, science and engineering |
| **d.General and Transferable Skills: :** | |
| 1 - | Manage time and meet deadlines. |

| Course Topic And Contents : | | | |
|---|---|---|---|
| **Topic** | **No. of hours** | **Lecture** | **Tutorial / Practical** |
| Slope-Deflection Method applied on plane beams and frames | 15 | 3 | 3 |
| Fundamentals of the Stiffness Method and its application on plane beams, frames, and trusses | 30 | 6 | 6 |
| Stiffness Method applied on grids | 10 | 2 | 2 |
| Stiffness Method applied on space trusses | | | |

| Teaching And Learning Methodologies : |
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| Class Lectures |
| Tutorials |

| Course Assessment : | | | |
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| **Methods of assessment** | **Relative weight %** | **Week No** | **Assess What** |
| Final-term Examination | 40.00 | | |
| Mid-Term Examinations | 40.00 | | |
| Quizzes | 10.00 | | |
| Semester Work | 10.00 | | |

| Course Notes : |
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| Recommended books : |
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| Periodicals : |
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| Web Sites : |
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