



## **Course Weekly Outline**

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| <b>Name</b>                                    | <b>Mr. Ahmed Abdulrazaq</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                   |
| <b>E-mail address</b>                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                   |
| <b>Course name</b>                             | <b>Prestressed Concrete</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                     |                   |
| <b>General course objective</b>                | 1. Ability to apply knowledge of basic mathematics through differential equations, science, and engineering to solving engineering problems.<br>2. Ability to formulate and solve civil engineering problems.<br>3. Understanding of professional and ethical responsibility.<br>4. Recognition of the need for, and an ability to engage in, life-long learning.<br>5. Ability to use modern tools, techniques, and computation methods necessary for civil engineering practice.                                                                                                                                                                                                                                                      |                     |                   |
| <b>Course description / special objectives</b> | The main objective is to insure that students understand the basic concepts and developing their problem solving strategies.<br>Most engineering students have difficulty in application of the fundamental concepts they have learned to specific cases. Therefore, the lecture material is incorporated with as many possible illustrative examples in order to facilitate the application of principles to actual problems.<br>Importance is placed on the significance of the results obtained for physical problems, as it is often the case nowadays with the development of engineering software, that the student is concerned with merely "solving the problem" and obtaining results without their interpretation physically. |                     |                   |
| <b>References</b>                              | "Elementary Theory of Structures", Yan-yu Hsieh, Prentice-Hall, 1982.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                     |                   |
| <b>External sources</b>                        | "Structural Analysis", Russel C. Hibbeler, 9 <sup>th</sup> ed., Pearson Education, 2014.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                     |                   |
| <b>Course assessment</b>                       | <b>Assignments and quizzes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Midterm Exam</b> | <b>Final exam</b> |
|                                                | <b>40</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | <b>10</b>           | <b>50</b>         |
| <b>General notes</b>                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                   |



## Course Weekly Outline

| Week No. | Theoretical                                                                  | Unit-chapter | Aims                                                                                                                                                                                                                                                                                                                                                                                                |
|----------|------------------------------------------------------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1        | Introduction                                                                 |              | 1. To develop an understanding of the basic principles of structural analysis and be able to explain them.<br>2. To determine and analyze models of applied loads on structures.<br>3. To develop and utilize influence lines of structures.<br>4. To utilize various methods of analysis of beams, trusses, and frames to determine the response of both determinate and indeterminate structures. |
| 2        | Yield line analysis for slabs                                                |              |                                                                                                                                                                                                                                                                                                                                                                                                     |
| 3        | One-Way Joist Slab (Ribbed Slab)                                             |              |                                                                                                                                                                                                                                                                                                                                                                                                     |
| 4        | Flat slab                                                                    |              |                                                                                                                                                                                                                                                                                                                                                                                                     |
| 5        | Waffle slab                                                                  |              |                                                                                                                                                                                                                                                                                                                                                                                                     |
| 6        | Precast slab                                                                 |              |                                                                                                                                                                                                                                                                                                                                                                                                     |
| 7        | Slabs on grade                                                               |              |                                                                                                                                                                                                                                                                                                                                                                                                     |
| 8        | Composite slab                                                               |              |                                                                                                                                                                                                                                                                                                                                                                                                     |
| 9        | Prestress concrete                                                           |              |                                                                                                                                                                                                                                                                                                                                                                                                     |
| 10       | Analysis of flexural member of prestress concrete beams                      |              |                                                                                                                                                                                                                                                                                                                                                                                                     |
| 11       | Analysis of flexural member of prestress concrete beams                      |              |                                                                                                                                                                                                                                                                                                                                                                                                     |
| 12       | Design of flexural member of prestress concrete beams                        |              |                                                                                                                                                                                                                                                                                                                                                                                                     |
| 13       | Design of flexural member of prestress concrete beams                        |              |                                                                                                                                                                                                                                                                                                                                                                                                     |
| 14       | development length and anchorage zone design                                 |              |                                                                                                                                                                                                                                                                                                                                                                                                     |
| 15       | Deflection and crack control for flexural member of prestress concrete beams |              |                                                                                                                                                                                                                                                                                                                                                                                                     |