

## EOC 3410C STRUCTURAL ANALYSIS

### ABET Course Syllabus

1. **Course number and name:** EOC 3410C Structural Analysis
2. **Credits and contact hours:** 3 credits / Two 80-minute Lecture each week.
3. **Instructor's or course coordinator's name:** Dr. H. Mahfuz
4. **Textbook, title, author, and year:** Structural Analysis, 11<sup>th</sup> edition, 2024, by R.C. Hibbeler, Pearson.
5. **Specific course information:**
  - (a) Brief description of the content of the course (catalog description): The course deals with classical methods of analysis of beams, trusses, frames, cables, and arches for ocean and other structural applications. Approximate methods, moment area, virtual work, consistent deformations.
  - (b) Prerequisites: EGN 3331 Strength of Materials (with a grade of C or above).
  - (c) indicate whether a required, elective, or selected elective course in the program: Required
6. **Specific goals for the course:**
  - (a) Specific outcomes of instruction (course specific objective): The objective of the course is to introduce students to classical methods of structural analysis as it applies to trusses, beams, and frames subject to static loads. The students should develop the ability to both model and analyze ocean structures to determine the internal forces and structural deformations.
  - (b) Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course. The learning outcomes of the course (and related ABET Criterion 3) outcomes are:
    1. Ability to analyze statically determinate structures such as trusses, beams and frames. (1)
    2. Ability to determine internal loadings in structural members, cables and arches. (1)
    3. Ability to estimate deflections in structural members using energy methods (1)
    4. Ability to analyze statically indeterminate structures using the force method. (1)
    5. Knowledge of fundamentals of stiffness method to analyze trusses. (1)
    6. Ability to use basic finite element code (ANSYS) to analyze trusses/beams and validate with experiment (6)
    7. Ability to understand, consider, apply and test engineering standards and codes, and communicate through writing reports (8).
7. **Brief list of topics to be covered:**
  - Types Of Structures and Loads
  - Analysis Of Statically Determinate Structures
  - Analysis Of Statically Determinate Trusses
  - Internal Loadings Developed in Structural Members
  - Cables And Arches
  - Influence Lines for Statically Determinate Structures
  - Deflections – moment area and conjugate beam methods
  - Deflection using energy method – unit load and Castigliano's methods
  - Analysis of statically indeterminate structures by the force method
  - Truss analysis using the stiffness method

