

ABET course syllabus (Steel Structures)

1. *Course number and name*
0901453: Steel Structures
2. *Credits and contact hours*
3 Credit Hours
3. *Instructor's or course coordinator's name*
Instructor: MazenMusmar, Associate Professor of Civil Engineering
Course Coordinator: MazenMusmar, Associate Professor of Civil Engineering.
4. *Text book, title, author, and year*
 - “Structural Steel design”, Jack McCormac and Stephen Csernak, 5th Edition, 2012.
 - a. *other supplemental materials*
 - “ Steel Construction Manual AISC, 14th Edition, 2010, Palgrave Macmillan
5. *Specific course information*
 - a. *brief description of the content of the course (catalog description)*
Introduction to structural steel design, Specifications, Loads and methods of design. Analysis and design of tension members. Analysis and design of compression members. Analysis and design of beams for flexure, shear and deflection. Plastic hinges, collapse mechanism. Analysis and design of Beam-columns; Analysis and design of Bolted and Welded connections
 - b. *prerequisites or co-requisites*
Prerequisite: Structures II (0901342)
 - c. *indicate whether a required, elective, or selected elective course in the program*
Required for Civil Engineering
6. *Specific goals for the course*
 - a. *Specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*
 - The student will be able to understand the basic concepts of the Structural steel design.
 - Student will be able to understand the material presented in AISC Manual, and to abide by all the technical issues in terms of design and practice according to AISC Manual provisions.
 - Student will be able to understand the performance of structural steel structures upon subjected to external loads.
 - Student will be able to analyze and design structural members that exist in hangers and buildings.
 - b. *Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*
Course addresses ABET Student Outcome(s): c, and e
7. *Brief list of topics to be covered*
 - Introduction to Structural steel.
 - Types of Structural Steel.
 - Structural Steel Sections
 - Structural steel material models.
 - Specifications and Methods of Design.
 - Specifications and Building Codes

- Loads
- Methods of Design
- Analysis of Tension Members
 - Nominal Strengths of Tension Members.
 - Effect of Staggered Holes
 - Effective Net Areas
 - Connecting Elements
 - Block Shear
- Design of Tension Members
 - Selection of Sections
 - Built up Tension Members
 - Rods and Bars, Pin-Connected Members
- Introduction to Axially loaded Compression Members
 - Residual stresses
 - Development of Column Formulas
 - The Euler Formula, Effective Lengths of Columns
 - Maximum Slenderness Ratios.
- Design of Axially loaded Compression Members and base plates
 - AISC Design Tables
 - Built up columns
 - Flexural Torsional Buckling of Compression Members
 - Alignment Charts
 - Frames
 - Base plates
- Introduction to Beams
 - Bending Stresses.
 - Elastic Design
 - Plastic Hinges
 - The Plastic Modulus
 - Theory of Plastic Analysis
 - The collapse Mechanism
 - The virtual work Method
 - The location of plastic hinge
 - Continuous Beams
- Design of Beams for Moments
 - Design of Beams, Zone1
 - Introduction to Inelastic buckling, zone2
 - Moment Capacities, Zone2
 - Elastic Buckling, Zone3
 - Design Charts.
 - Noncompact Sections
 - Design of Continuous Beams
 - Shear
 - Deflections
 - The Shear Center
- Connections
 - Bolted Connections
 - Welded Connections.