



**Department of Engineering Technology
Construction Engineering Technology Program
Course Syllabi**

Course Number and Name:

CET 233 – Structural Analysis in Construction

Credits and Contact Hours:

Credits - 3; Contact Hours – 1.5 Hour Lectures, twice a week

Course Coordinator's Name

Prof. John A. Wiggins, P.E., Senior University Lecturer and Program Coordinator

Textbook(s) and recommended materials:

2 Text books are required:

Structural Steel Design, J. McCormac and S. Csernak, 6th edition, (2018), Pearson, ISBN 0134589653.

Reinforced Concrete Design, A. Aghayere, 9th edition,(2019), Pearson, ISBN 0134715357.

Other Supplemental Materials: CFR 1926 (OSHA Regulations)

Specific Course Information

Course Description:

This course will cover the aspects of the design and construction of structural steel and reinforced concrete for construction engineering technology students. This will include the design of beams, slabs and columns as well review of the connection of these structural members as encountered in practice.

Prerequisites and Co-Requisites:

MET 237, Strength of Materials for Technology or equivalent

Course Status

This is a required course.

Specific Goals for the Course

Specific outcomes of instruction

At the conclusion of the course the student will be able to understand, design and construct structural steel and reinforced concrete beams, slabs, columns and similar structural elements. The application of safe construction practices in steel erection and concrete construction is also covered.

Relation to Student Outcomes

Student Outcome 1 – An ability to apply knowledge, techniques skills and modern tools of science, engineering and technology to solve broadly defined engineering problems;

Student Outcome 2 – An ability to design systems, component or processes meeting specified needs for broadly defined engineering problems appropriate to the discipline;

Program Specific Criteria d

Application of fundamental computational methods and elementary analytical techniques in sub-disciplines related to construction engineering; in this case, the sub-discipline is structural engineering;

Program Specific Criteria g

Selection of appropriate construction materials and practices;

Program Specific Criteria i

Performance of standard analysis and design in at least one sub-discipline related to construction engineering; in this case the sub-discipline is structural engineering;

Brief list of Topics covered

This course is divided into 2 distinct portions: Structural Steel Design and Reinforced Concrete Design.

1. *Structural Steel Design:*

Practical application of steel design using the LRFD (Load and Resistance Factor Design) procedure as governed by the American Institute of Steel Construction. Topics include principles of structural design and analysis using steel as the primary building material. Analysis and design of steel members, such as beams, girders, columns and connections are studied using the principles of statics. A study of framing and load analysis will be done for various loading conditions. Safety practices in steel erection as defined by CFR 1926 Subpart R.

2. *Reinforced Concrete Design:*

Practical application of concrete design using the **Strength Design procedure** as governed by the American Concrete Institute. Topics include: principles of structural design using reinforced concrete as the material and concrete framing systems using beams, frames, girders and footings as the primary structural elements. Safety practices in concrete construction as defined by CFR 1926 Subpart Q.