SOUTHEAST COMMUNITY COLLEGE
CONSTRUCTION MANUFACTURING AND TECHNOLOGY DIVISION
Design & Drafting Technology Program
Revision Date: August 22, 2022

I. CATALOG DESCRIPTION

Course Number:	DDRT2530
Course Title:	Steel Systems Design and Drafting
Prerequisite(s):	DDRT1120, DDRT1170
Catalog Description:	This course covers the principles of structural steel design and drafting. Including the study of the characteristics of steel, how steel reacts to applied loads, the manufacturing of steel columns, beams, girders, use of pre-fabricated steel joist and methods of connecting these pieces together. Explore and discuss the distinctive plans required for structural steel drawings. All of this is put together in the drafting of required structural drawings.
Credit Hours:	3
Class Hours:	23
Lab Hours:	68
Total Contact Hours:	91

II. COURSE OBJECTIVES: *Course will:*

- **A.** Introduce structural steel shapes and uses.
- **B.** Utilize the AISC Manual of Steel Construction to locate a variety of steel shapes.
- **C.** Utilize the dimensions and properties tables in the AISC Manual of Steel Construction to identify unknown shapes.
- **D.** Familiarize the student with iron and steel making.
- **E.** Identify the roles of the mill and fabricator.
- **F.** Familiarize the student with design of steel column and beam framing.
- **G.** Introduce various connection methods for structural steel.
- **H.** Compare the differences between architectural, structural and shop drawings.
- **I.** Illustrate how to interpret commercial building plans.
- **J.** Design and layout open web steel joist roof and floor systems.
- **K.** Size simple beams and columns for joist problems.
- **L.** Familiarize student with column and wall footing design.
- **M.** Generate a broader understanding of heavier building systems.
- **N.** Explore employment opportunities based on demand, availability and benefits for this segment of the design industry.
- **O.** Familiarize students with the variety of plain steel shapes currently in production.
- **P.** Demonstrate the design of clip angle and seated steel connections.
- **Q.** Demonstrate the proper production of steel shop drawings.
- **R.** Demonstrate the proper layout of a foundation plan and details.

III. STUDENT LEARNING OUTCOMES AND GENERAL EDUCATION LEARNING OUTCOMES:

- **A.** Student Learning Outcomes: *Student will be able to:*
  - **1.** Identify the uses of the various structural steel shapes.
  - **2.** Locate structural steel shapes in the AISC Manual of Steel Construction.
  - **3.** Draw structural steel shapes using the dimensions and properties found in the AISC Manual of Steel Construction.
  - **4.** Describe the steps for iron and steel making.

5. Describe the roles of the mill and fabricator.
6. Layout a steel column and beam framing plan.
7. Detail and note various connection methods for structural steel.
8. List the differences between architectural, structural and shop drawings.
9. Read and interpret commercial building plans.
10. Design and layout open web steel joist roof and floor systems.
11. Size simple beams and columns for joist problems.
12. Size simple spread footings and continuous footings.
13. Develop a broader understanding of heavier building systems.
14. Describe employment opportunities based on demand, availability and benefits for this segment of the design industry.
15. Find the plain steel shapes in the AISC manual and determine their sizes and weights.
16. Review a framing plan and with loads on beams and column sizes will be able to design and detail slated connections with coping at the ends of the beams.
17. Understand the importance of the anchor bolt plan and associated details for a commercial building.
18. Design the bolt layout, plate sizes, bolt extension, and grout requirements for steel sections bearing on concrete in a sample exercise.
19. Gain knowledge of reinforcing in concrete and demonstrate this through the layout of a gridded footing plan with the calculations of the reinforcing schedule and associated bar list.

B. General Education Learning Outcomes (GELOs)

1. GELO #3: Critical Thinking & Problem Solving
   Outcome 1: Collect, identify, interpret and analyze data.

IV. CONTENT/TOPICAL OULTINE

A. Steel Basics
B. Steel Shapes Identification
C. Steel Fabrication
D. Steel Applications
E. Steel Shop Drawings
F. Bolted Connections
G. Welded Connections
H. Joist Basics
I. Reinforcing Steel/Anchor Rods
J. Structural Skelton Design
K. Plain Steel Shapes
L. Left Hand Pieces
M. Clip Angle Connection
N. Seated Connection
O. Anchor Bolt Placement
P. Framing Plan

V. INSTRUCTIONAL MATERIALS

A. Required Text(s):

1. *Manual of Steel Construction,* (Refer to CID and/or instructor for current edition) Students will receive a coupon code from the instructor on the first day of class to purchase the book directly from AISC.
2. *Fundamentals of Building Construction Materials and Methods*, Allen & Iano (Refer to CID and/or instructor for current edition)

B. Other Resources: Provided for use in class—

1. Ketchum Handbook, reprint, *Handbook of Standard Structural Details*
2. *Vulcraft Joist Catalog,* (supplied by instructor)

C. Supplies:
1. Calculator
2. Scales

VI. METHODS OF PRESENTATION/INSTRUCTION

A. Methods of presentation typically include a combination of the following:
1. Lecture
2. Classroom discussion
3. Instructional Handouts
4. Power Point Presentations
5. Videos

VII. METHODS OF EVALUATION

A. Methods of evaluation, although determined by the individual instructor, traditionally includes a combination of the following:
1. Attendance and participation
2. Daily assignments
3. Written exams and/or quizzes
4. Performance and observational assessment

VIII. SPECIFIC COURSE REQUIREMENTS

A. Student must meet all of the following:
1. Achieve passing grade of 60% or higher, based on SCC grading scale.
2. Submit own work. Students turning in calculations or homework by someone other than themselves will receive 0% and will be referred to the Dean of Students for further disciplinary action.