

COURSE SYLLABUS

ARCE 1352 (3:2:4)

STRUCTURAL DRAFTING

Computer-Aided Drafting and
Design Technology

Industrial Technology Department

Technical Education Division

Levelland Campus

SOUTH PLAINS COLLEGE

Fall 2017

SCANS COMPETENCIES

RESOURCES: Identifies, organizes, plans and allocates resources.

- C-1 **TIME**--Selects goal--relevant activities, ranks them, allocates time, and prepares and follows schedules.
- C-2 **MONEY**--Uses or prepares budgets, makes forecasts, keeps records, and makes adjustments to meet objectives
- C-3 **MATERIALS & FACILITIES**--Acquires, stores, allocates, and uses materials or space efficiently.
- C-4 **HUMAN RESOURCES**--Assesses skills and distributes work accordingly, evaluates performances and provides feedback.

INFORMATION--Acquires and Uses Information

- C-5 Acquires and evaluates information.
- C-6 Organizes and maintains information.
- C-7 Interprets and communicates information.
- C-8 Uses computers to Process information.

INTERPERSONAL--Works With Others

- C-9 Participates as members of a team and contributes to group effort.
- C-10 Teaches others new skills.
- C-11 Serves clients/customers--works to satisfy customer's expectations.
- C-12 Exercises leadership--communicates ideas to justify position, persuades and convinces others, responsibly challenges existing procedures and policies.
- C-13 Negotiates--Works toward agreements involving exchanges of resources resolves divergent interests.
- C-14 Works with Diversity--Works well with men and women from diverse backgrounds.

SYSTEMS--Understands Complex Interrelationships

- C-15 Understands Systems--Knows how social, organizational, and technological systems work and operates effectively with them
- C-16 Monitors and Correct Performance--Distinguishes trends, predicts impacts on system operations, diagnoses systems' performance and corrects malfunctions.
- C-17 Improves or Designs Systems--Suggests modifications to existing systems and develops new or alternative systems to improve performance.

TECHNOLOGY--Works with a variety of technologies

- C-18 Selects Technology--Chooses procedures, tools, or equipment including computers and related technologies.
- C-19 Applies Technology to Task--Understands overall intent and proper procedures for setup and operation of equipment.
- C-20 Maintains and Troubleshoots Equipment--Prevents, identifies, or solves problems with equipment, including computers and other technologies.

FOUNDATION SKILLS

BASIC SKILLS--Reads, writes, performs arithmetic and mathematical operations, listens and speaks

- F-1 Reading--locates, understands, and interprets written information in prose and in documents such as manuals, graphs, and schedules.
- F-2 Writing--Communicates thoughts, ideas, information and messages in writing, and creates documents such as letters, directions, manuals, reports, graphs, and flow charts.
- F-3 Arithmetic--Performs basic computations; uses basic numerical concepts such as whole numbers, etc.
- F-4 Mathematics--Approaches practical problems by choosing appropriately from a variety of mathematical techniques.
- F-5 Listening--Receives, attends to, interprets, and responds to verbal messages and other cues.
- F-6 Speaking--Organizes ideas and communicates orally.

THINKING SKILLS--Thinks creatively, makes decisions, solves problems, visualizes, and knows how to learn and reason

- F-7 Creative Thinking--Generates new ideas.
- F-8 Decision-Making--Specifies goals and constraints, generates alternatives, considers risks, and evaluates and chooses best alternative.
- F-9 Problem Solving--Recognizes problems and devises and implements plan of action.
- F-10 Seeing Things in the Mind's Eye--Organizes and processes symbols, pictures, graphs, objects, and other information.
- F-11 Knowing How to Learn--Uses efficient learning techniques to acquire and apply new knowledge and skills.
- F-12 Reasoning--Discovers a rule or principle underlying the relationship between two or more objects and applies it when solving a problem.

PERSONAL QUALITIES--Displays responsibility, self-esteem, sociability, self-management, integrity and honesty

- F-13 Responsibility--Exerts a high level of effort and preservers towards goal attainment.
- F-14 Self-Esteem--Believes in own self-worth and maintains a positive view of self.
- F-15 Sociability--Demonstrates understanding, friendliness, adaptability, empathy, and politeness in group settings.
- F-16 Self-Management--Assesses self accurately, sets personal goals, monitors progress, and exhibits self-control.
- F-17 Integrity/Honesty--Chooses ethical courses of action.

Levelland Campus

COURSE SYLLABUS

COURSE TITLE: ARCE 1352: STRUCTURAL DRAFTING

INSTRUCTOR: Micheal Coler

OFFICE LOCATION Technical Arts Bldg. Room TA205A

AND PHONE/E-MAIL: 806-716-2351, pkennon@southplainscollege.edu

OFFICE HOURS: T -Th 2:50 -5:00 Friday 8:00 - 12:00 by appointment

SOUTH PLAINS COLLEGE IMPROVES EACH STUDENT'S LIFE

I. GENERAL COURSE INFORMATION:

A. COURSE DESCRIPTION

STRUCTURAL DRAFTING (3:2:4) Prerequisite: ARCH 1315 or DFTG 1309 or ENGR 1304 and DFTG 2300. A study of structural systems including concrete foundations and frames, wood framing and trusses, structural steel framing systems. Includes detailing of concrete, wood, and steel to meet industry standards including the American Institute of Steel Construction and The American Concrete Institute.

The scope of Structural Detailing (ARCE 1452) will be for sixteen weeks, which will include two hours of lecture per week and four hours of laboratory per week, for a total of ninety-six contact hours per semester.

B. COURSE LEARNING OUTCOMES

Exhibit knowledge of steel, wood and concrete systems; use reference materials, produce drawings for concrete, wood, and steel framing systems; design details and connections for framing components; and analyze the advantages and disadvantages of various systems.

C. COURSE COMPETENCIES

Upon successful completion of this course (as outlined by: Lesson & Grade Criteria and Standards for course grades) the student will have accomplished the following skills and abilities:

1. Understand drafting department engineering practices of typical structural steel fabricators.

2. Demonstrate practical proficiency in lettering styles used in structural steel detailing.
3. Be familiar with the alphabet of lines used in structural steel detailing.
4. Demonstrate proficiency in the use of scales (measurement) used in structural steel detailing.
5. Be familiar with American Institute of Steel Construction Standards and American Concrete Institute Standards, data, terms, and abbreviations.
6. Demonstrate an understanding of designing bolted framed beam connections and practical proficiency in drawing and detailing bolted framed beam connections.
7. Demonstrate an understanding of designing Case I framed beam connections.
8. Demonstrate an understanding of designing Case II framed beam connections and practical proficiency in drawing and detailing Case II framed beam connections.
9. Demonstrate an understanding of designing Case III framed beam connections and practical proficiency in drawing and detailing Case III framed beam connections.
10. Be familiar with drawing Bill of Materials used by structural steel fabricators and prepare a drawing bill of material for framed beam connections.
11. Demonstrate an understanding of designing unstiffened seated beam connections (bolted) and practical proficiency in drawing and detailing bolted unstiffened seated beam connections.
12. Demonstrate an understanding of designing unstiffened seated beam connections (welded) and practical proficiency in drawing and detailing welded unstiffened seated beam connections.
13. Demonstrate an understanding of designing stiffened seated beam connections (bolted) and practical proficiency in drawing and detailing bolted stiffened seated beam connections.
14. Demonstrate an understanding of designing stiffened seated beam connections (welded) and practical proficiency in drawing and detailing welded stiffened seated beam connections.
15. Be familiar with column types used in structural steel, and column plans.
16. Be familiar with beam framing plans used in structural steel detailing.

17. Demonstrate an understanding and practical proficiency in elementary design and detailing of prestressed and reinforced concrete products.
18. Demonstrate an understanding and practical proficiency in elementary design and detailing of poured-in-place members.
19. Demonstrate an understanding and practical proficiency in elementary design and detailing of structural wood members.

D. ACADEMIC INTEGRITY

It is the aim of the Computer-Aided Drafting and Design Technology faculty of South Plains College to foster a spirit of complete honesty and a high standard of integrity. The attempt of any student to present as his or her own work which he or she has not honestly performed is regarded by the faculty and administration as a most serious offense and renders the offender liable to serious consequences, possibly suspension. Students should refer to the SPC General Catalog policy regarding consequences for cheating and plagiarism (see "Academic Integrity" as well as "Student Conduct" sections in the college catalog). At times, working with other students is encouraged for some assignments and meets SCANS competencies C-9 through C-14. If you have a question as to whether you may work with other students on any assignment, ask your instructor.

E. SCANS AND FOUNDATION SKILLS

Appropriate competencies and foundation skills set forth by the Secretary's Commission on Achieving Necessary Skills (SCANS) have been integrated into the ARCE 1452, Structural Detailing course. Specifically, they are C1, C2, C3, C5, C6, C7, C11, C14, C15, C18, F1, F3, F4, F5, F6, F10, F11, F12, F13, and F14.

F. VERIFICATION OF WORKPLACE COMPETENCIES

ARCE 1452, Structural Detailing, is offered in the last phase of the Computer-Aided Drafting and Design Technology student's course work. During this phase, a Capstone Learning Experience is provided for students in their last semester to complete degree or certificate program requirements.

II. SPECIFIC COURSE/INSTRUCTOR REQUIREMENTS

A. TEXTBOOK & OTHER MATERIALS

2nd edition of Structural Steel Drafting and Design, by David C. MacLaughlin and Hector Estrada. No other materials are required.

B. ATTENDANCE POLICY

The CAD Technician is a professional person working in a business or industrial setting that demands much from its team of employees. For this reason, one who is often tardy or absent from work creates an additional burden for his or her co-workers.

The Computer-Aided Drafting and Design Technology program, similar to all the allied engineering professions, requires mature attendance to both lecture sessions and laboratory experiences. Obviously, once missed, a class situation cannot be effectively recreated for students who are not present. Your instructors feel that for a student to succeed, that student must not only be present, but must exercise prudent use of class time.

Late or absent members tend to retard the progress of the entire class.

Punctual and regular attendance is required of all students attending South Plains College. **THERE ARE NO EXCUSED ABSENCES.** Students are responsible for all classwork covered during absences from class, even in cases in which they are able to satisfy the instructor that the absence was unavoidable. **ABSOLUTELY NO CLASS TIME WILL BE USED TO UPDATE INFORMATION MISSED DUE TO TARDINESS OR ABSENTEEISM;** the student must arrange an appointment with the instructor at a time that will not conflict with class schedules.

There are two possible absences in a day one for lecture time and one for lab. The student will be allowed six (6) absences or twelve (12) tardies. Four tardies equal one absence. After seven absences have been tallied the course grade will be dropped one letter grade, nine will drop an additional letter grade. Additional absences after 9 could result in student being dropped from the course. (Tardies will be five or more minutes past class start time as shown in the appropriate schedule of classes. Also leaving class without all active assignments completed before the last 15 (fifteen) minutes will also be counted as a tardy). Any student wishing to drop this class should go through the proper procedure of initiating the withdrawal by obtaining a drop form from the Registrar's Office. This procedure provides the opportunity for counseling with the student by the instructor and determining the reason and justification for withdrawal.

C. ASSIGNMENT POLICY

1. All required work must be turned in on time in order for the student to benefit from the corrections and to study for future examinations.
2. All assignments (practical drawing assignments and/or practical drawing test, objective assignments and/or objective test) will be due at *specified times and dates*.
3. Any drawing assignments that are *not* turned in at the specified time and date will immediately receive a grade penalty of 5 points and an additional 10 points per day for each day the drawing is not turned in for grading.

D. GRADING POLICY/PROCEDURE

1. Assignments = 60% of semester grade. Each practical drawing assignment grade and /or practical drawing test, and any objective assignment and /or objective grade will be calculated with 100 points as the highest possible grade.
2. Practical drawing assignments will be graded on the following:
 - a. Neatness
 - b. Line Criteria
 - c. Text Criteria
 - d. Dimensioning Criteria
 - e. Choice & Location of Views
 - f. Correctness & Accuracy of Views (shape description)
 - g. Nomenclature
 - h. Printing and Plotting
3. Final Exam = 15% of the semester grade. The final examination will be a comprehensive exam comprised of information taken from the review questions and class presentations. The exam will be based on 100 points.
4. Tests = 15% of semester grade. No Mid-Term Exam is given in this course. Three tests during the semester averaged together will equal 15% of the semester grade.
5. Chapter Review Questions = 10% of the semester grade. Students will be assigned review questions for each chapter covered in the textbook. Each assignment will be graded based on 100 points, and returned to the student as a study guide for the upcoming test.

STANDARDS FOR COURSE GRADES

A - EXCELLENT

Student can complete ALL tasks within specified clock times and dates with excellent quality and with initiative and adaptability to solving problems with limited assistance and/or supervision.

B - GOOD

Student can complete ALL tasks within specified clock times and dates with good quality and with initiative and adaptability to solving problems with periodic assistance and/or supervision.

C - AVERAGE

Student can complete ALL tasks with satisfactory quality, but requires recurring assistance and/or supervision.

D - BELOW AVERAGE

Student can complete more than 3/4 of all tasks satisfactorily, but frequently requires assistance and/or supervision to perform the required skills.

F - FAILURE

Student completes less than 3/4 of all tasks satisfactorily, and requires continual assistance and/or supervision to perform the required skills.

A. SPECIAL REQUIREMENTS

BUILDING POLICIES

1. **ABSOLUTELY NO** food, drinks or the use of tobacco products will be allowed in the classroom.
2. Music devices may be used with earphone/plug during lab time as long as sound cannot be heard by other students. You must be able to hear comments made by the instructor during the lab time.
3. Cellular phones and beepers must be turned off and placed in pocket or backpack during class lecture time.
4. Each student must clean his/her workstation at the end of class.
5. **ABSOLUTELY NO** rough or boisterous play or profanity will be allowed in the classroom.
6. Students should adhere to standards established in the SPC Catalog (Student Conduct) and Student Guide. Students in the Computer-Aided Drafting and Design Technology program must follow all safe practices in the classroom and other laboratory work areas. Further, chemical hazards and appropriate MSDS safety practices will be covered by the instructor during the first class session if potential for exposure exists.
7. The nature of Computer-Aided Drafting and Design Technology is to stay within established perimeters. In staying with these standards, the computers within the CAD Lab have been optimally set to enhance learning for students. The configurations are set to establish a base of reference for all students, and so the instructor can optimize aid to each student.

III. COURSE OUTLINE

A. TOPICS

1. ORIENTATION
2. ENGINEERING AND DRAFTING DEPARTMENT PRACTICES
3. DRAWING EQUIPMENT, INSTRUMENTS AND MATERIALS
4. LETTERING
5. ALPHABET OF LINES
6. MEASUREMENTS (SCALES)
7. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) STANDARDS
AND AMERICAN CONCRETE INSTITUTE STANDARDS
8. BILLS OF MATERIALS
9. FRAMED BEAM CONNECTIONS
BOLTED
CASE I
CASE II
CASE III
10. UNSTIFFENED SEATED BEAM CONNECTIONS
BOLTED
WELDED
11. STIFFENED SEATED BEAM CONNECTIONS
TYPE A
TYPE B
TYPE C
WELDED
12. COLUMN DESIGN
13. PRESTRESSED AND REINFORCED CONCRETE DESIGN
14. POURED-IN-PLACE CONCRETE DESIGN
15. STRUCTURAL WOOD DESIGN

IV. ACCOMMODATIONS

Diversity Statement

In this class, the teacher will establish and support an environment that values and nurtures individual and group differences and encourages engagement and interaction. Understanding and respecting multiple experiences and perspectives will serve to challenge and stimulate all of us to learn about others, about the larger world and about ourselves. By promoting diversity and intellectual exchange, we will not only mirror society as it is, but also model society as it should and can be.

Disabilities Statement

Students with disabilities, including but not limited to physical, psychiatric, or learning disabilities, who wish to request accommodations in this class should notify the Disability Services Office early in the semester so that the appropriate arrangements may be made. In accordance with federal law, a student requesting accommodations must provide acceptable documentation of his/her disability to the Disability Services Office. For more information, call or visit the Disability Services Office at Levelland (Student Health & Wellness Office) 806-716-2577, Reese Center (Building 8) & Lubbock Center 806-716-4675, or Plainview Center (Main Office) 806-716-4302 or 806-296-9611.

Non-Discrimination Statement

South Plains College does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities. The following person has been designated to handle inquiries regarding the non-discrimination policies: Vice President for Student Affairs, South Plains College, 1401 College Avenue, Box 5, Levelland, TX 79336. Phone number 806-716-2360.

Campus Concealed Carry - Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in South Plains College buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and South Plains College policy, license holders may not carry a concealed handgun in restricted locations. For a list of locations, please refer to the SPC policy at: (http://www.southplainscollege.edu/human_resources/policy_procedure/hhc.php)

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all South Plains College campuses. Report violations to the College Police Department at 806-716-2396 or 9-1-1.