

Civil Drafting Technology – The Theory and Practice of Civil Engineering and Surveying Drafting and Mapping

CEST 51, Section 1239 – Fall 2018 Course Syllabus

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Course Goal

The primary goal of this class is to introduce students to basic manual drafting skills, computer-aided drafting and design (CADD), and the production of civil engineering, surveying and land development plans, plats, maps and drawings utilizing AutoCAD Civil 3D software. Topics include linework, lettering skills, geometric constructions, drawing perspectives and types, software organization, commands and tools, symbols, dimensioning, annotation, mapping scales and output types all in the context of civil engineering and surveying project deliverables.

As a class, students will be exposed to the concepts identified in the "Topics and Scope" area below. Upon completion of the course, students are not expected to be civil drafting experts, but they will have acquired a basic understanding of manual (hand) drafting, 2D AutoCAD, and the theory of Civil Drafting. This course is intended to establish a foundation which students can use to broaden their knowledge and better prepare themselves for CEST85 – Computer-Aided Drafting for Civil, Surveying, and Land Development using AutoCAD Civil 3D 2018.

Topics and Scope

PART 1: Introduction to Basic Manual Drafting (4 weeks)

- Introduction to contemporary drafting
- Drafting equipment and supplies
- Drafting conventions and formats
- Geometric construction
- Views and perspectives
- Dimensioning conventions

PART 2: Introduction to AutoCAD (approximately 6 weeks)

- CAD drawing environment and drawing tools
- Geometric construction and positioning tools
- Geometric constructions
- Multi-view drawings
- Plotting

PART 3: Introduction to Civil Drafting Theory (approximately 8 weeks)

- Graphical representation in civil engineering, surveying, and land development projects
- Types of maps and drawings
- Surveying measurements in civil drafting
- Contour lines
- Profiles and cross sections
- Roadway layout
 - ✓ tangent curve geometry
 - ✓ horizontal curve types - simple, compound, and reverse
 - ✓ vertical curve types - sag and crest
 - ✓ layout and stationing
- Earthwork
 - ✓ cross sections
 - ✓ volume calculations
- Legal descriptions and plats
 - ✓ types of legal descriptions
 - ✓ plotting legal descriptions and plats

Student Learning Outcomes

Upon completion of this course, students will be able to:

- Properly select and utilize drafting equipment in the production of manual drafting projects
- Produce consistent linework, legible lettering, and graphically execute geometric constructions in assigned manual drafting projects
- Develop orthographic and isometric drawings and utilize appropriate dimensioning conventions in completing a manual drafting project
- Demonstrate knowledge of AutoCAD file management, commands and drawing environments
- Generate and edit geometric constructions, projections, dimensioning, and text annotations
- Demonstrate proficiency using AutoCAD blocks, creating/managing layers and line types, and effectively control printing/plotting of AutoCAD drawing files
- Identify proper scale, orientation, symbols, and conventions used in civil engineering and land surveying
- Prepare civil engineering plans, drawings, and maps using computer-aided drafting software
- Prepare and interpret plats, maps and legal descriptions of properties

Recommended Course Prerequisite

- Completion or concurrent enrollment in SURV 60 (Introduction to Plane Surveying)
- High school geometry

Course Expectations

CEST 51 is the first of two Civil Drafting/CADD-based courses. This course will be relatively fast-paced due to the number of topics that will be covered. CEST 51 is designed to provide the fundamentals of manual drafting, 2D AutoCAD, and Civil and Survey data management, basic project development, and basic map production skills. In CEST 51, students will develop the most basic civil drafting skills in order to prepare students for CEST 85 and to become entry-level Civil and Survey Technicians upon completion of the certificate requirements. A serious student attitude is strongly encouraged and a team learning approach underpins the course culture. A team learning approach is one where a student takes an equal (or better) measure of responsibility for their learning experience through their participation, performance and professional attitude.

Course Schedule

- 8/21-9/13: Tuesdays and Thursdays from 5:00PM to 7:30PM in Shuhaw Hall, RM 1752 (Drafting Lab)
- 9/18-12/13: Tuesdays and Thursdays from 5:00PM to 7:30PM in Shuhaw Hall, RM 1751 (CAD Lab)
- Final Exam Date: 12/18. Tentative time of exam: 4:00PM to 6:45PM. The final exam is mandatory.

Required Reading Materials

- Beginning AutoCAD 2018, Industrial Press, by Cheryl R. Shrock and Steve Heather
- Civil Drafting Technology, 8th Edition, by David P. Madsen, Terence Shumaker, and David A. Madsen
- AutoCAD Civil 3D 2018 Fundamentals, SDC Publications, by Ascent

Other Materials

- 3-ring binder for handouts and assignment materials
- Scientific-Engineering calculator. (Do not rely on your cell phone – it will not be allowed during exams)
- Engineer's scale and straight edge (a small drafting triangle)
- USB drive

Class Preparation and Attendance

- Attendance is required for both lab and lecture hours. Your lack of attendance can and will affect your grade for this course. Attendance is considered a part of the "class participation" portion of your grade (5%). Class generally begins on the hour and ends at ten (10) minutes before the scheduled end of class.
- It is good practice to notify your instructor **by email** if you are going to be tardy or absent. An excused absence may be granted by contacting instructor **sufficiently prior** to the beginning of class.
- Students are responsible for all material discussed in lecture and lab as well as the readings and assignments. Taking notes is a good practice.
- Students are responsible for correctly obtaining any missed lecture or laboratory course information from their fellow classmates. Your class participation can and will affect your final grade, as will your class conduct.
- There will be no make-ups for missed class activities (quizzes, exams, in-class demonstrations, etc). Rarely, certain late assignments may be accepted but will be discounted starting at 20% off the total point value,

depending on how many classes have passed since the due date. Such instances will be solely at the instructor's discretion.

- **Excessive unexcused absences will not be tolerated.** Per SRJC's policy, if a student misses over 10% of total class hours, they can be dropped from the course.

Assignments

- Weeks 1-4: Reading assignments will be provided by the instructor;
- Week 5-9: Read approx. 5-6 chapters ("Lessons") from the Beginning AutoCAD 2018 textbook per week;
- Week 9-17: Read approx. 2 chapters from the Civil Drafting Technology textbook and 1-2 chapters from the AutoCAD Civil 3D 2018 Essentials textbook per week.
- Homework/chapter review problems assigned from textbook or instructor handouts. The number of assigned problems will vary, depending on the topic.
- Weekly lab assignments using manual drafting and/or CAD.
- **6-8 announced quizzes over the course of the semester.**
- Midterm examination on Part 2 of the course.
- 1 CAD-based Survey Map Project and 1 report.
- Written and computer-based final exam on Part 3 of the course.
- All assignments are to be done as instructed and are due at the beginning of class on the assigned due date. Late assignments will only be accepted with instructor's **prior** approval. A penalty will be deducted from the grade of the late assignment.
- All assignments shall include your name, assignment number or title, and due date. Multiple sheets shall be stapled together prior to turning in.
- Unless it's a manual drafting assignment, all written assignments shall be typed and double-spaced. Please answer all questions with complete sentences.
- Assignments are your responsibility. Failure to observe these conditions may result in no credit!

Quizzes and Exams

- Quizzes and exams will be given on specific areas covered throughout the semester. Sufficient notice will be given prior to the scheduled exam. Brief reviews will be conducted during the previous class lecture.
- **Except when due to extenuating circumstances, NO MAKE-UP QUIZZES OR EXAMS WILL BE GIVEN.**

Tentative Course Schedule

- A tentative course schedule will be distributed prior to the first day of class. The objective of the schedule is to assist you in planning your schedule. Every effort will be made to stay on schedule. However, the instructor may find it necessary to make appropriate adjustments to meet the learning objectives for the entire class. If/when the schedule requires changes, you will receive a revised schedule with the changes noted in **red**.

Grading

- Your grade will be based on the total number of points you accumulate with respect to the "top score" total number of points. The sum of the points in each category are multiplied by the following percentages and then added together to determine total points accumulated:

$$\begin{array}{r} \text{HOMEWORK} = 15\% \\ \text{LAB ASSIGNMENTS} = 35\% \\ \text{QUIZZES} = 20\% \\ \text{EXAMINATIONS/PROJECT/REPORT} = 25\% \\ + \text{CLASS PARTICIPATION} = 5\% \\ \hline \text{Total Accumulated Points} \end{array}$$

- Lab assignments are typically worth 25 points each but can/will also vary. Homework points will vary. Exams and class project are worth 100-150 points, and quiz points will vary. The final exam is worth 250 points (150 points for the written portion and 100 points for the CAD portion). Final grades are calculated as noted above and are based on the following percentages of the total points accumulated by the top score in each category.

A	=	90%-100%
B	=	80%-89%
C	=	70%-79%
D	=	60%-69%
F	=	Below 60%

Communications

- If you need to get in touch with me, I can be reached at the email address jlooper@santarosa.edu. Please include "CEST 51" in the subject line of the email. I check my email at least twice a day.

Office Hours

- Office hours are from 4:20PM to 4:50PM on Tuesdays and Thursdays in Bussman Hall, RM 1476 and from 7:30PM to 8:00PM, **if arrangements are made in advance**. Please visit my [website](#) for more information.

Class Preparation

It is very likely that you will NOT be able to complete the CAD-based assignments during the allotted lab time, therefore having access to a computer with Civil 3D 2018 installed is CRITICAL to passing this course. If students require additional time beyond the allotted lab time to complete their assignments, there will be scheduled open lab hours posted outside the computer labs after the first week of classes (See below).

Autodesk provides a free student download of the Educational version of Civil 3D 2018 so that students with home computers or laptops will be able to work at home, outside of class hours. The software is available here: <http://www.autodesk.com/education/free-software/autocad-civil-3d>. The Civil 3D software is very hardware-intensive, so be certain that your computer meets the minimum hardware requirements prior to installing. Please be advised that we will be using the **2018** version of AutoCAD Civil 3D and it is not backwards-compatible with earlier versions. If/when you choose to download the software, be certain to select only the 2018 version. Do not download the 2019 version – otherwise you will not be able to open your files in the lab. Please note that it is only necessary to download Civil 3D 2018, as it also includes basic AutoCAD 2018. Before attempting to download and install the software, students should be proficient in software installation, file management, and correctly transferring class data to and from their own USB drives. Please do not ask me software installation-related questions.

*****Please note that downloading the software onto your own PC is not a substitute for attending the lab portion of the class. Your attendance is required and the SRJC attendance policy will be strictly enforced*****

It is the student's responsibility to consult the SRJC web-based information listed below -- please do so as it is considered a part of this syllabus:

- SRJC Schedule of classes: <https://classes.santarosa.edu/>
- SRJC Academic Calendar: <http://admissions.santarosa.edu/academic-calendar/>
- SRJC Rights & Responsibilities: <https://studentlife.santarosa.edu/rights-and-responsibilities>
- SRJC Disability Resources: <http://drd.santarosa.edu/>
- SRJC Student Services: <https://student-services.santarosa.edu/>
- SRJC Academic Program Information: <https://www.santarosa.edu/academics/>

Class Conduct & Courtesy

During lectures, students should be listening to the presentation. Unless instructed to do so, students shall refrain from working on assignments during the lecture or presentation. Students must refrain from having conversations, checking email, phone, or web-browsing during lectures. Please silence your cell phones at the start of class. Disruptive and/or confrontational behavior will result in the student being dismissed from class and the loss of points for that day. **No student is allowed to print or plot during any lecture under any circumstances.**

Open Lab

There will be open lab time in Shuhaw Hall Rm 1799 and 1751. A schedule will be posted on the doors to the labs. There may be lab seats available during other courses in progress. When desiring to occupy an empty workstation during a lecture, students should politely inquire with the instructor prior to just taking a seat. If a student shows up late and you are occupying their seat, you must vacate IMMEDIATELY.

Syllabus Purpose and Disclaimers

This syllabus is an agreement. Continued registration in CEST 51 means that you, the student, agree to the policies and procedures outlined in this document. If some aspect or aspects of the syllabus are unclear to a student, it is their responsibility to inquire regarding that matter at the beginning of the course.

This syllabus is intended to provide the student with guidance in what will be covered during the semester and will be followed as closely as possible. **However, the instructor reserves the right to modify, supplement or make changes as necessary for general course needs as the semester progresses. Changes shall be noted in red.**