Santa Rosa Junior College

SRJC
CATE
COURSE HOMEPAGE

Civil & Surveying Technology, Applied Technology Department

CEST 81: Engineering Construction Design/Drafting

Section 0339, Fall 2004
Class begins: 8/16/2004 Class ends: 12/8/2004 Final: 12/13/2004
1799 Shuhaw, Santa Rosa Campus
Monday & Wednesday 11:00am to 1:30pm

INSTRUCTOR

Jerry Miller, PLS jmiller@santarosa.edu INSTRUCTOR HOMEPAGE

DESCRIPTION

This is a course in public works design. The student will prepare a set of improvement plans for a roadway project using the City of Santa Rosa Design and Construction Standards. The student will learn the proper design and drafting techniques applied to mapping, grading, highways, underground utilities, detailing, structures and estimating. The student will be taught to prepare the necessary drawings using AutoCAD/Land Dev. Desktop and associated computer programs used by local engineering agencies and firms.

The student will:
Identify and list the use, elements, and need for design standards.

Prepare engineering construction drawings in their proper format, content and layout.

Demonstrate an understanding of the use of engineering construction drawings and details.

Demonstrate the proper procedures for interpreting and utilizing surveying data in the design process.

Perform complex computations involving horizontal and vertical roadway alignments.

Construct specific diagrams, plans, views and drawings for earthwork, retaining walls, roadways, utilities and topographic mapping.

Prepare an engineer's cost estimate for their roadway project.

Prepare contract specifications for specific portions of the project.

Official SRJC course outline, description, and catalog information for all sections of this course

CONTENT

The objective of this outline 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 changes to meet the learning objectives for the entire class.

You should be prepared for the project assignment prior to the class lecture. Some students may find it necessary to arrange time outside of the schedule hours to complete the assignments.

TENTATIVE SEMESTER SCHEDULE

Introduction to Land Development Desktop Software
Engineering Design and Construction Standards, Symbols,
Scale and Sheet Layout

Topographic Mapping

Plan View – Grading Plan & Horizontal Alignment

Profile View - Underground Utilities Plan & Vertical Alignment

Roadway Structural Section Design & Computations

Cross-section View & Earthwork Computations

The Engineer's Estimate - Writing and Interpreting Contract Specifications

Legend & Cover Sheets

Final submittal of complete set of improvement plans and documents

EXPECTATIONS

I expect you to be on time and prepared for the days lessons. Previous assignments and homework will be due at the beginning of the class. We will spend the first portion of the class answering any questions concerning the reading, homework and assignments from the previous class.
Computer-Aided Drafting:
All assignments will be completed using the CAD system. Upon completion of the lecture portion of the course, you will use these PC's to complete your assignments. Your attendance is mandatory for both portions of the class.

All students will be taught how to use the Autodesk's Land Development Desktop Software. It is assumed that each student has completed Ap Tech 56 (Intro to AutoCAD) and CEST 51 (Civil Drafting Technology) prior to taking this course. We will be using the Windows NT, AutoCAD 2004, LDD3 and Microsoft Office Pro Software packages.

All assignments will be given with a due date. Students may need to arrange for outside time to meet the deadlines set for each assignment. It is important that each student budget their time wisely to meet these deadlines.

This course will be run as if you were working for a local engineering firm or agency. You will be expected to conduct yourself accordingly. Your attendance, participation and ability to meet deadlines will be figured into your grade.

LECTURE NOTES FOR:

Design Standards

Introduction:
The purpose of design standards is to communicate our intentions to those involved in using or interpreting engineering drawings and plans. Design standards also allow for many people to work on the same drawing and have the drawing maintain it's unique look and style. Every organization has standards. Some are more rigid or complete than others. Some organizations "borrow" standards from other's to form there own "unique" standards.

Standards "regulate" lettering, line types, format, style, symbols and overall presentation. It is relatively easy to differentiate between different engineering company's plans just by there "look". One can usually tell what engineering firm produced a set of plans by merely looking at the north arrow.

The most rigid or complete set of standards are the State of California, Department of Transportation's (Caltrans) STANDARD PLANS. These standards describe the types of equipment, markings, procedures, materials and quantities used on State construction projects. Many other projects at the local level use these standards during their construction. Some local agencies have set up standards based off of Caltrans but with variations and amendments to meet their needs.

We will be using the City of Santa Rosa's Design and Construction Standards for our projects in this class. You should be familiar with the specific standards, information and data contained within each standard and the proper use. We will set up our class standards for lettering, line types, symbols, and format.

We will have a symbol for most every standard in our syllabus. It is important to note that there is an exception to every rule and standard. Therefore, we must use some common sense in communicating our intentions of our plans.

Class Standards:
In most cases, all existing features, improvements and symbols are shown in a "lighter" line weight or dashed lines. Proposed features, improvements and symbols are shown in a heavier line weight or solid lines. We will adhere to this policy.

Lettering is always read from the bottom of the page or the right. In a few instances it may be read from the left, ie., the angle of the lettering is greater than 90°. Lettering shall be all CAPITALS not upper and lower case, unless you are trying to show a emphasis to something.

We will, as a class, agree to specific symbols to represent existing and proposed features. We will define symbols for PIPELINES, SANITARY SEWER, STORM DRAIN, WATER, TRAFFIC & LIGHTING, STRIPING & MARKINGS, UTILITIES, TREES, MISCELLANEOUS features and SHEET LAYOUT. You will be allowed to design your own North Arrow for your drawings.

ASSIGNMENTS:

Assignment No. 1 - Design & Construction Standards
Due Monday 8-23-04 beginning of class

Introduction:
The purpose of design standards is to communicate our intentions to those involved in using, interpreting or constructing from engineering drawings and plans. Every organization has standards. Some are more rigid or complete than others. Some organizations "borrow" standards from other's to form there own "unique" set of standards. Design standards govern what, where, why and how something is designed and built.

The information shown on a typical design standard includes:
1. the title,

2. description of what the standard is used for,
3. materials to be used,
4. dimensions,
5. design parameters,
6. maximums and minimums,
7. a date of approval,
8. notes of importance
9. approved signature from the city engineer.

The standard is usually drawn not to scale, however, some form of scale should be used.

Assignment:
Recreate on the CAD system a typical design and construction standard from your course syllabus (City of Santa Rosa, Department of Public Works, Design & Construction Standards).

This will be a finished quality drawing; plotted on 8½" x 11" paper, at an appropriate scale, with a title and title block, appropriate labels, notes and dimensioning.

After drawing the standard, create a layout and insert the "R-sheet" drawing onto the layout. Create a viewport and scale your standard to fill the sheet.

This assignment is worth 50 points. Turn in this sheet with your plot.