

**El Paso Community College**  
**Syllabus**  
**Part II**  
**Official Course Description**

<b>SUBJECT AREA</b>	<u><b>Computer-Aided Design</b></u>
<b>COURSE RUBRIC AND NUMBER</b>	<u><b>ARCE 2452</b></u>
<b>COURSE TITLE</b>	<u><b>Mechanical and Electrical Systems</b></u>
<b>COURSE CREDIT HOURS</b>	<u>    <b>4</b>    <b>3</b>    <b>:</b>    <b>3</b></u> Credits    Lec        Lab

**I. Catalog Description**

Explores the properties of building materials (assemblies), specifications, codes, vendor references, and uses of mechanical, plumbing, conveying, and electrical systems as they relate to architecture for residential and commercial construction **Prerequisite: DFTG 2332. (3:3).**

**II. Course Objectives**

Upon satisfactory completion of this course the student will be able to:

**A. Unit I. Planning and Organization**

1. Develop and prioritize work flow.
2. Coordinate plans with various applicable disciplines using Internet/Intranet and prepare transmittals
3. Research vendor data and specifications utilizing network searches.
4. Communicate via e-mail to coordinate and develop project.
5. Explain how time management impacts on project timelines.
6. Assemble plans to IAW NCS/AIA standards and maintain drawing files and project activity log.

**B. Unit II. Water Supply**

1. Describe the various types of systems and their respective graphic symbols used in plumbing drawings.
2. Design an up-feed water supply system, hot and cold water, for a given residential structure.
3. Prepare working drawings, plan view, isometric riser diagram, and necessary details, for the above residential structure.

**C. Unit III. Plumbing, Waste, and Storm Drainage**

1. Describe and understand the terminology and function of the various parts of storm, soil and waste drainage systems.
2. Design a residential plumbing drainage system for a given residential structure.
3. Draw a complete drain, waste, and vent piping plan for the above residence.
4. Design a private sewage disposal system for a given residential structure.
5. Draw the details of a residential size septic tank, plan and longitudinal section, and seepage/leach field.

**D. Unit IV. Heat Loss**

1. Identify the terminology associated with and be able to use factors in heat loss calculations.
2. Demonstrate the above by performing selected design exercises on calculating  $U$  and  $R$  values.

**E. Unit V. Heating Systems and Design, Hot Water & Gas**

1. Recognize and describe the various types of hydronic heating systems, equipment and terminology.
2. Draw a complete set of plans for a baseboard hot water heating system for a given residence to include detail of the boiler, detail of the baseboard fin tube, and appropriate schedules.
3. Identify the terminology and graphic symbols used in ductwork design.
4. Design a ductwork system for a given residence.
5. Draw a plan of a residence showing ducting and furnace location for each of two gas furnaces from a given engineering sketch.

**F. Unit VI. Heat Gain and Forced Air System Design (A/C & E/C)**

1. Identify the terminology and process associated with heat gain calculations.
2. Describe the various equipment and components in air conditioning system installation.
3. Describe the various equipment and components in evaporative cooling system installation.
4. Draw a complete set of HVAC (evaporative cooling) plans on a given residence to include all necessary details and schedules.

**G. Unit VII. Solar Hot Water System**

1. Draw a piping plan of a domestic hot water system from a given engineering sketch.
2. Draw a detail of the equipment and a detail of the solar panels mounted on the roof from vendor specification sheets.

**H. Unit VIII. Electrical System Design**

1. Identify the various graphic symbols and terminology used in electrical circuit design.
2. Perform an electrical design layout of a given one-family residence.
3. Draw a complete power plan for a given one-family residence.
4. Draw a complete lighting plan for a given one-family residence.
5. Draw a reflected ceiling plan for a given room in the one-family residence.

**I. Unit IX. Special Systems and Sound Control**

1. Describe the various systems and graphic symbols for security, fire, and smoke detection.
2. Describe and understand the various techniques in design and construction for optimum sound control.

**III. THECB Learning Outcomes (WECM)**

1. Perform mechanical/electrical/plumbing (MEP) calculations.
2. Select MEP components.
3. Interpret codes and specifications.
4. Produce MEP drawings.

**IV. Evaluation**

**A. Challenge Exam**

There is a challenge exam available for this course. Coordination for any challenge exam should be made through the Drafting Department Coordinator.

B. Post-assessment

1. The instructor will maintain a continuous record of each student's progress.
2. Students should be evaluated periodically throughout the semester.
3. The instructor will determine the weight of each graded assignment. \*
4. Instructors will require drawing assignments, quizzes, and formal exams.

C. Grading Scale

A	= 92.5 - 100
B	= 85.0 - 92.4
C	= 75.0 - 84.9
D	= 65.0 - 74.9
F	= below 65
I	= Incomplete
W	= Withdrew or Withdrawn

\*For grade percentage of individual assignments and exams refer to the Syllabus - Instructor's Course Requirements.

**V. Disability Statement (Americans with Disabilities Act [ADA])**

EPCC offers a variety of services to persons with documented sensory, mental, physical, or temporary disabling conditions to promote success in classes. If you have a disability and believe you may need services, you are encouraged to contact the Center for Students with Disabilities to discuss your needs with a counselor. All discussions and documentation are kept confidential. Offices located: VV Rm C-112 (831-2426); TM Rm 1400 (831-5808); RG Rm B-201 (831-4198); NWC Rm M-54 (831-8815); and MDP Rm A-125 (831-7024).

**VI. 6 Drop Rule**

Students who began attending Texas public institutions of higher education for the first time during the Fall 2007 semester or later are subject to a 6-Drop limit for all undergraduate classes. Developmental, ESL, Dual Credit and Early College High School classes are exempt from this rule. All students should consult with their instructor before dropping a class. Academic assistance is available. Students are encouraged to see Counseling Services if dropping because exemptions may apply. Refer to the EPCC catalog and website for additional information.