

ARCHITECTURAL DESIGN 1 AND 2

Course Codes: 6170, 6171

COURSE DESCRIPTION: The Architectural Engineering program prepares students interested in architectural and engineering design professions through design technology and techniques. Using computer-aided software, students create working drawings that meet industry standards and codes. Upon successful completion of the Architectural Engineering program, students will be prepared for postsecondary education and entry-level architectural and engineering-related careers.

OBJECTIVE: Given the necessary equipment, materials, and instruction, the student, on completion of the prescribed course of study, will be able to successfully accomplish the following core competencies.

RECOMMENDED GRADE LEVELS: 9 - 12

CREDIT: 1 (120 hours) or 2 (240 hours) Carnegie units per course code

PREREQUISITE: None

COMPUTER REQUIREMENT: One computer per student

RECOMMENDED SOFTWARE: AutoDesk Suite and/or BIM Software

RESOURCES: [SC Instructional Materials and Resources](#)

SAFETY

Professionals know the academic subject matter, including. They will use this knowledge. The following accountability criteria are considered essential for students in any program of study.

1. Review school safety policies and procedures.
2. Review classroom safety rules and procedures.
3. Review safety procedures for using equipment in the classroom.
4. Identify major causes of work-related accidents in office environments.
5. Demonstrate safety skills in an office/work environment.

STUDENT ORGANIZATIONS

Professionals know the academic subject matter, including professional development. The following accountability criteria are considered essential for students in any program of study.

1. Identify the purpose and goals of a Career and Technology Student Organization (CTSO).
2. Explain how CTSOs are integral parts of specific clusters, majors, and/or courses.

3. Explain the benefits and responsibilities of being a member of a CTSO.
4. List leadership opportunities that are available to students through participation in CTSO conferences, competitions, community service, philanthropy, and other activities.
5. Explain how participation in CTSOs can promote lifelong benefits in other professional and civic organizations.

TECHNOLOGY KNOWLEDGE

Professionals know the academic subject matter, including the ethical use of technology. The following accountability criteria are considered essential for students in any program of study.

1. Demonstrate proficiency and skills associated with the use of technologies that are common to a specific occupation.
2. Identify proper netiquette when using e-mail, social media, and other technologies for communication purposes.
3. Identify potential abuse and unethical uses of laptops, tablets, computers, and/or networks.
4. Explain the consequences of social, illegal, and unethical uses of technology (e.g., piracy; illegal downloading; cyberbullying; licensing infringement; inappropriate uses of software, hardware, and mobile devices in the work environment).
5. Discuss legal issues and the terms of use related to copyright laws, Creative Commons, fair use laws, and ethics pertaining to downloading of images, photographs, Creative Commons, documents, video, sounds, music, trademarks, and other elements for personal use.
6. Describe ethical and legal practices of safeguarding the confidentiality of business-related information.
7. Describe possible threats to a laptop, tablet, computer, and/or network and methods of avoiding attacks.

PERSONAL QUALITIES AND EMPLOYABILITY SKILLS

Professionals know the academic subject matter, including positive work practices and interpersonal skills. The following accountability criteria are considered essential for students in any program of study.

1. Demonstrate creativity and innovation.
2. Demonstrate critical thinking and problem-solving skills.
3. Demonstrate initiative and self-direction.
4. Demonstrate integrity.
5. Demonstrate work ethic.
6. Demonstrate conflict resolution skills.
7. Demonstrate listening and speaking skills.
8. Demonstrate respect for diversity.
9. Demonstrate customer service orientation.
10. Demonstrate teamwork.

PROFESSIONAL KNOWLEDGE

Proficient professionals know the academic subject matter, including positive work practices and interpersonal skills. The following accountability criteria are considered essential for students in any program of study.

1. Demonstrate global or “big picture” thinking.
2. Demonstrate career and life management skills and goal-making.
3. Demonstrate continuous learning and adaptability skills to changing job requirements.
4. Demonstrate time and resource management skills.
5. Demonstrates information literacy skills.
6. Demonstrates information security skills.
7. Demonstrates information technology skills.
8. Demonstrates knowledge and use of job-specific tools and technologies.
9. Demonstrate job-specific mathematics skills.
10. Demonstrates professionalism in the workplace.
11. Demonstrates reading and writing skills.
12. Demonstrates workplace safety.

A. INTRODUCTION TO DRAFTING TECHNIQUES

Proficient drafters demonstrate appropriate drafting skills. The following accountability criteria are considered essential for students in the Architectural Design program of study.

1. Identify alphabet of lines to include line weight (thickness).
2. Create multi-view drawings.
3. Utilize hand lettering techniques to neatly add notes and/or dimensions to sketches.
4. Demonstrate measuring skills using various tools, including an architectural scale.

B. DEMONSTRATE CAD-SPECIFIC SKILLS

Proficient drafters demonstrate appropriate CAD-specific skills. The following accountability criteria are considered essential for students in the Architectural Design program of study.

1. Identify and utilize elements of the graphical user interface (e.g., ribbon, panels, command line, drop-down menus, and toolbars).
2. Identify the use of various file formats (e.g., .dwg, .dxf, .dwt, .bak).
3. Import and export various data files between formats.
4. Open and save various file types in a structured directory.
5. Perform drawing setup to applicable standards (e.g., setting layers, line type, and line weight).
6. Identify and use display commands (e.g., zoom and pan).

7. Draw geometric components using straight and curved lines.
8. Create and modify borderlines and title block.
9. Modify geometric components (e.g., copy, trim, scale, and stretch).
10. Modify geometric properties (e.g., layer, color, line weight, and type).
11. Use inquiry commands to extract drawing data (e.g., list, distance, and area).
12. Annotate drawings to include text and dimensions.
13. Create, retrieve, edit, and use symbol libraries.
14. Utilize paper space and create viewports.
15. Plot/print drawing to appropriate scale.
16. Use software help features.

C. DEMONSTRATE ARCHITECTURAL DESIGN SKILLS

Proficient drafters demonstrate appropriate architectural design skills. The following accountability criteria are considered essential for students in the Architectural Design program of study.

1. Draw floor plans.
2. Draw various plans (e.g., foundation, roof, multi-story).
3. Set and control dimensioning styles.
4. Dimension various types of architectural plans and details.
5. Prepare schedules (e.g., finish, window, door).
6. Draw exterior elevations.
7. Draw interior elevations.
8. Draw various sections (e.g., building, floor, wall, stairs).
9. Draw details (e.g., footer, moulding, fireplace).
10. Apply standard building codes to architectural plans.

OPTIONAL:

Proficient drafters demonstrate enhanced architectural design skills. The following accountability criteria are considered essential for students in the Architectural Design program of study.

1. Draw related architectural plans (e.g., mechanical, electrical, or civil).
2. Evaluate alternative building materials for environmental sustainability.
3. Prepare and present presentation drawings (e.g., project-based learning and
4. portfolios).
5. Create 3-D architectural drawings/renderings.

Course Materials, Resources, and Equipment Listing

Course Academic Standards and Indicators