

University of Arkansas, College of Education and Health Professions
Department of Curriculum and Instruction

- 1. Program Affiliation:** Career and Technical Education: Technology and Engineering Education
- 1.1 Course Number and Title:** TEED 1203 Drafting Technology I (Introduction to CAD I)
- Prerequisites:** None
- Meets:** T/TH 11:00-12:20pm
Peabody Hall Computer Lab and 317 Peabody Hall
- 1.2 Instructor:** Vinson Carter
vcarter@uark.edu
575-3076
314 Peabody Hall
- Office Hours:
Monday/Wednesday - 9:30-11:30am
Tuesday/Thursday - 1:30-3:30pm
Friday - By Appointment

1.3 Textbooks and/or Supplementary Materials

There is no textbook required for this course. However, students are required to have access to the following software:

- CorelCAD
- CorelDRAW Graphics Suite X6

Research Base

International Technology and Engineering Education Association. (2000). *Standards for technological literacy: Content for the study of technology*. Reston, VA: Author.

Can be downloaded for free at: <http://www.iteaconnect.org/TAA/PDFs/xstnd.pdf>

French, T. E. & Helsel, J.D. (2003). *Mechanical drawing: Board and CAD techniques*. Peoria, IL: Glencoe/McGraw-Hill.

2. Course Description/Justification

- 2.1 Catalog Description:** This introductory course in technology and engineering education focuses on the development and introduction of lettering, sketching,

applied geometry, pictorial drawing, orthographic projection, and computer-aided drafting and design (CADD/CAD).

- 2.2 Relationship to Knowledge Base:** This course supports the “Specialty Studies” component of the Scholar-Practitioner model by providing the teacher education candidate with a set of technological problem solving tools that can be used to develop curricula, deliver instruction, and guide learning in the technology and engineering education classroom. The course will model the methods expected in a contemporary technology and engineering education facility and expose the candidate to instructional strategies utilized throughout exemplary programs in the field.

3. Goals and Objectives

3.1 Goals

This course is designed to provide knowledge and methods for solving technological problems and teaching computer-aided drafting and design. Elements of design and theory will be applied through the course.

All candidates pursuing degrees in the College of Education and Health Professions are expected to apply the principles of the conceptual framework as *Scholar Practitioners*. The scholar practitioner reflects a professional who is knowledgeable about subject matter and pedagogy; skillful in teaching and managing classrooms and schools; caring about students, families, school staff and the community; and constantly inquiring to better the profession and increase the success of students, schools and the community. The scholar practitioner is **knowledgeable, skillful, caring and inquiring** and is defined by the following tenets:

1. One who accesses, uses, or generates knowledge
2. One who plans, implements, and models best practices
3. One who understands, respects, and values diversity
4. One who is a developing professional and a lifelong learner
5. One who communicates, cooperates, and collaborates with others
6. One who makes decisions based upon ethical standards and professional criteria
7. One who is knowledgeable about teachers and teaching, learners and learning, and schools and schooling

Technology: As with all teacher preparation coursework, students are expected to demonstrate technological competence in this course. This technological competence will be demonstrated through the use of the appropriate technological hardware and software as well as other web-based applications. Scholar-practitioners will utilize technology that enhances the instructional process during the completion on this course.

3.2. Objectives

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

- 3.2.1. Understand the use of computer-aided drafting and design to construct accurate 2D and 3D drawings;
- 3.2.2. Utilize the vocabulary, primary concepts, definitions, and techniques applicable to drafting and design;
- 3.2.3. Apply technical tools and resources toward solving design problems using computer-aided drafting and design software;
- 3.2.4. Develop confidence in the use and development of sketching and lettering;
- 3.2.5. Develop the ability to meet given criteria and solve engineering and architectural-related problems using applied geometry;
- 3.2.6. Utilize the vocabulary, primary concepts, definitions, and models applicable to drafting and design;
- 3.2.7. Demonstrate the ability to communicate engineering and architectural design concepts through pictorial and multi-view drawings; and
- 3.2.8. Develop the ability to use CAD designs to create products using laser and 3D prototyping technology.

4. Student Activities and Experiences

4.1. Assignments/Tasks

Grades for each student will be based on the following assignments:

- 4.1.1. Professionalism (attendance and participation) (20 points)
Students are expected to attend all classes and participate in all activities. Students are required to maintain professional decorum during class.
- 4.1.2. Daily and weekly assignments (30 points)
Students will participate in ongoing daily and in-class design and engineering activities, assignments, readings, and discussion.
- 4.1.3. Midterm and Final (30 points)
- 4.1.4. Development of a CAD portfolio (20 points)

5. Content Outline

5.1. Introduction to Drafting and Design

- a. Sketching
- b. Lettering
- c. Visualization and conceptualization
- d. Measurement and Geometry
- e. Design as a tool for teaching technology and engineering
- f. The relationship between adjoining disciplines (science, technology, engineering and mathematics)

5.2. Introduction to CAD

- a. Hardware and software
- b. Setting up drawings and preferences
- c. Drawing commands
- d. Edit commands
- e. Saving and plotting

5.3. Fundamentals design techniques

- a. Foundational concepts
- b. Form, function, balance, texture, etc.
- c. Adhering to design parameters and constraints
- d. Technological assessment

5.4. The tools of design

- a. Questioning/clarifying the problem
- b. Identifying constraints/limitations
- c. Gathering research
- d. Quantifying/mental modeling
- e. Visioning and graphic representation
- f. Drawing and modeling
- g. Prototyping and assessment
- h. Artifact development
- i. Communicating results

5.5 Engineering design

- a. Multi-view drawing
- b. Dimensioning
- c. Section Views
- d. Pictorial Drawing

5.6 Architectural design

- a. Types of drawings
- b. Dimensioning
- c. Construction and Materials
- d. Section Views

5.7 Design production

- a. Laser technology
- b. 3D prototyping

6. Evaluation Policies

6.1. The following scale will be used to determine the final grade in the course:

- A = 92% - 100%
- B = 82% - 91%
- C = 72% - 81%
- D = 60% - 71%
- F = Below 60%

7. Syllabus Change

The Instructor reserves the right to make changes as necessary to this syllabus. If changes are made, advance notification will be given to the class.

8. Academic Policies

8.1 Accommodations

Students with disabilities requesting reasonable accommodations must first register with the Center for Students with Disabilities. The CSD is located in the Arkansas Union, Room 104, and on the web at <http://www.uark.edu/ua/csd/applications.htm>. The CSD provides documentation to students with disabilities who must then provide this documentation to their course instructors. Students with disabilities should notify their course instructors of their need for reasonable accommodations in a timely manner to ensure sufficient time to arrange reasonable accommodation implementation and effectiveness. A typical time frame for arranging reasonable accommodations for students who are registered with the CSD is approximately one to two weeks.

8.2 Academic Integrity

The application of the University of Arkansas Academic Integrity Policy will be fully adhered to in this course. Grades and degrees earned by dishonest means devalue those earned by all students; therefore, it is important that students are aware of the University of Arkansas Academic Integrity Policy. Academic dishonesty involves acts, which may subvert or compromise the integrity of the educational process.

"As a core part of its mission, the University of Arkansas provides students with the opportunity to further their educational goals through programs of student and research in an environment that promotes freedom of inquiry and academic responsibility. Accomplishing this mission is only possible when intellectual honesty and individual integrity prevail."

"Each University of Arkansas student is required to be familiar with and abide by the university's Academic Integrity Policy' which may be found on the UA website. Students with questions about how these policies apply to a particular course or assignment should immediately contact their instructor."

The description of the Academic Integrity Policy is located at:

<http://provost.uark.edu/245.php>

The Academic Integrity Sanction Rubric is located at:

<http://provost.uark.edu/246.php>

All students are to complete their own work during the semester. Although students are allowed to share ideas and help one another throughout the semester, students are not allowed to share drawing files. All drawings and assignments must be completed individually.

8.3 Inclement Weather

For information regarding whether the university is closed or an inclement weather day is declared, use the following sources:

- See the inclement weather web site at: <http://emergency.uark.edu/11272.php>
- Call 479-575-7000 or the university switchboard at 575-2000 for recorded announcements about closings.
- Listen to KUAF Radio, 91.3 FM, or other local radio and television stations for announcements.
- Check your e-mail.

8.4 Instructor Policies

Attendance

Students are expected to attend all classes and participate in all activities.

Professionalism

Students are required to maintain professional decorum during class. Cell phones and other electronic devices must be turned off and out of sight during class.

Inappropriate and disruptive classroom behavior (including the use of cell phones, iPads, laptops, and other electronic devices) will not be tolerated.