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

1. Program Affiliation: Career and Technical Education: Technology Education

1.1 Course Number and Title: TEED 12003 Drafting Technology I - Introduction to CAD

Prerequisites: None

1.2 Instructor:

Vinson Carter, Ph.D.
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Office: 479-575-3076
314 Peabody Hall

Office Hours: 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 a computer capable of operating these software programs:

- Autodesk - https://www.autodesk.com/education/free-software/featured
  - TinkerCAD
  - Fusion 360
  - REVIT
- CorelDRAW/Adobe Illustrator

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.

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:

- Daily and weekly assignments (300 points)
  Students are expected to attend all classes and participate in all activities. Students will participate in ongoing daily and in-class design and activities, assignments, readings, and discussion.

- Autodesk Fusion 360 CAD Project (350 points)
  Students will complete the Learn Autodesk Fusion 360 in 30 Days Project on YouTube - https://www.youtube.com/playlist?list=PLrZ2zKOtC_-C4rWfapgngoe9o2-ng8ZBr and submit a shared folder of their completed drawings.

- Laser Project (125 points)
- 3D Printing Project (125 points)
- REVIT Primer (350 points)

  Students will complete the REVIT Primer series of tutorials found at - https://www.dropbox.com/scl/fo/a9lrourqtsk0bxylqihdy/AGy67mq2QR_KVAbnSIBXYYY?rlkey=ew6wyq07opigyjrhoczkrs5xz&st=cjbvai5j&dl=0 and submit a .pdf packet of their completed drawings.

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. Grading Scale: A=100-93; B=92-85; C=84-78; D=77-70; F-below 69.

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 Academic Honesty: As a core part of its mission, the University of Arkansas provides students with the opportunity to further their educational goals through programs of study 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/candidate is required to be familiar with and abide by the University's 'Academic Integrity Policy' which may be found at http://provost.uark.edu/ Candidates with questions about how these policies apply to a particular course or assignment should immediately contact their instructor.

Specific permissions will be provided to students regarding the use of generative artificial intelligence tools on certain graded activities in this course. In these instances, I will communicate explicit permission as well as expectations and any pertinent limitations for use and attribution. Without this permission, the use of generative artificial intelligence tools in any capacity while completing academic work submitted for credit, independently or collaboratively, will be considered academic dishonesty and reported to the Office of Academic Initiatives and Integrity.

All students are to complete their own work during the semester. Although students are allowed to share ideas and learn from one another throughout the semester, students are not allowed to copy another person's work. All assignments must be original and completed individually. All citations must be documented using the 6th edition of the APA manual (http://www.apastyle.org/, http://psychology.vanguard.edu/faculty/douglas-degelman/apa-style/)

8.2 Attendance Policy: This course is reserved for candidates preparing to become professional teachers. Subsequently, the ethics and responsibilities of professional teachers will be expected of all participants. Candidates must attend all classes to receive the maximum benefit and to avoid leaving their professional responsibilities in the hands of classmates. Candidates will be allowed two "sick" days regardless if excused or unexcused, if needed. This will result in the loss of participation points for the two missed days. Additional absences will result in the lowering of

one letter grade per absence in your final grade. Furthermore, two occasions of coming late to class or leaving early will be counted as one absence. Candidates are expected to arrive early, stay focused and attentive during the class, and submit all required materials prior to the due date. Late work will not be accepted for full-credit.

8.3 Professionalism: All candidates are to complete their own work during the semester. Although candidates are allowed to share ideas and learn from one another throughout the semester, students are not allowed to copy another person's work. All assignments must be original and completed individually unless working as a team on a given assignment.

Candidates are required to maintain professional decorum during class. **Cell phones, laptops, 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) will result in the loss of points from daily assignment grades.** The only exception to this rule is when using a device to conduct research, take photos, record times, use appropriate software, etc. during a STEM design challenge while working in design teams.