Course Description

This course will focus on basic engineering drawing skills including freehand drawing, orthographic, projection and basic descriptive geometry, axonometric drawings, and developments. Emphasis will be placed on documentation of design work using manual drafting; computer aided drafting, and freehand sketching. Students will be provided with instructional methods to be able to conduct a Technical drawing component in 6-12 Technology Education classrooms (Freshman/Sophomore standing).

Overall Goals of the Course

The overarching goal of this course is to give the student a comprehensive understanding of how communicating technological designs (either freehand or computer aided) are an essential part of technology education in the 9-12 classroom. Possessing these skills will transfer to all other areas of technology education; i.e., construction, transportation, etc.

TaskStream Code: 22B8UU
The Conceptual Framework in the Professional Education Unit (PEU) at Florida A&M University is an integrated approach to providing educational experiences that result in exemplary professional educators. The Framework is comprised of six themes with the mission of developing high quality classroom teachers, administrators and support personnel. The term “exemplary” refers to the kind of graduates the PEU strives to produce. The figure below provides a diagram of the Exemplary Professional Conceptual Framework.

### TECHNOLOGY

**CF 2**

Through this focal area, the FAMU professional education candidate will:

| CF: 2.1 (S) | Use of available technology and software to support student learning. | F: 4,12 | I: 6 |
| CF: 2.3 (K) | Know fundamental concepts in technology. | F: 12 | I: 1,6 |

### CRITICAL THINKING

**CF 4**

Through this focal area, the FAMU professional education candidate will:

| CF: 4.1 (K) | Understand a variety of instructional/professional strategies to encourage student development of critical thinking and performance. | F: 4,7 | I: 4 |
| CF: 4.2 (S) | Use a variety of instructional/professional strategies to encourage students’ development of critical thinking and performance. | F: 2,7 | I: 4 |
| CF: 4.3 (D) | Value critical thinking and self-directed learning as habits of mind. | F: 4 | I: 1,4 |
| CF: 4.4 (K) | Acquire performance assessment techniques and strategies that measure higher order thinking skills of student. | F: 1,4 | I: 1,8 |
| CF: 4.5 (S) | Demonstrate the use of higher order thinking skills. | F: 8 | I: 4 |

### PROFESSIONALISM

**CF 5**

Through this focal area, the FAMU professional education candidate will:

| CF: 5.3 (D) | Demonstrate commitment to professional growth & development. | F: 3,7 | I: 9 |
| CF: 5.5 (S) | Construct learning opportunities that support student development & acquisition of knowledge & motivation. | F: 7 | I: 5 |

### URBAN/RURAL EDUCATION

**CF 6**

Through this focal area, the FAMU professional education candidate will:

| CF: 6.2 (S,D) | Be able to work in school settings that focus on rural/urban context with opportunities and challenges that these environments provide. | F: 11 | I: 3 |
### Specific Behavioral Objectives

**Matrix for Alignment with Standards and the**  
The Florida Agricultural and Mechanical University  
College of Education Conceptual Framework

- **Standards with which the course objectives are aligned:**
  - The Florida Agricultural and Mechanical University College of Education and Human Services Conceptual Framework (FAMU CF)
  - Florida Educator Accomplished Practices (FEAP)
  - Florida Subject Area Competencies (FSAC)
  - International Technology and Engineering Education Association (ITEEA)
  - Interstate New Teacher Assessment and Support Consortium (INTASC)

<table>
<thead>
<tr>
<th>Course Objectives</th>
<th>INTASC (I)</th>
<th>FSAC (FS) ITEEA (I)</th>
<th>FAMU CF (CF) FEAP (FE)</th>
<th>Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge/Content</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>1) Explain the importance of design in the human-made world.</td>
<td>1</td>
<td>FS: 1.1, 1.2</td>
<td>CF: 4.1</td>
<td>• FAMU Parking Problem Technology Learning Activity</td>
</tr>
<tr>
<td>2) Contrast the attributes of design.</td>
<td>1, 8</td>
<td>FS: 2.4, 2.5</td>
<td>CF: 4.1</td>
<td>• Discussion Board 1</td>
</tr>
<tr>
<td>3) Effectively apply design criteria, technical drawing/sketching and planning</td>
<td>1, 6</td>
<td>FS: 2.4</td>
<td>CF: 2.3</td>
<td>• Research Paper</td>
</tr>
<tr>
<td>methodologies to communicate technical and design ideas.</td>
<td></td>
<td>I: 10</td>
<td>FE: 12</td>
<td>• Autodesk Inventor Tutorials</td>
</tr>
<tr>
<td>4) Identify efficient designs and materials as they relate to product performance</td>
<td>1, 6</td>
<td>FS: 1.5, 2.7</td>
<td>CF: 2.3</td>
<td>• Research Paper</td>
</tr>
<tr>
<td>economic, social, and environmental criteria.</td>
<td></td>
<td>I: 6</td>
<td>FE: 12</td>
<td>• Discussion Board 2</td>
</tr>
<tr>
<td>5) Identify the use of drafting instruments, equipment, and materials.</td>
<td>6</td>
<td>FE: 2.1, 11.5</td>
<td>CF: 2.1</td>
<td>• Research Paper</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I: 8, 9, 10</td>
<td>FE: 4, 12</td>
<td>• Autodesk Inventor Tutorials</td>
</tr>
<tr>
<td>Skills/Performance</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>6) Select design problems, including establishing criteria and constraints of a</td>
<td>7</td>
<td>FS: 2.7, 13.3</td>
<td>CF: 4.2</td>
<td>• FAMU Parking Problem Technology Learning Activity</td>
</tr>
<tr>
<td>given problem.</td>
<td></td>
<td>I: 9, 10</td>
<td>FE: 2, 7</td>
<td>• Final Project Documentation</td>
</tr>
<tr>
<td>7) Evaluate a design, assessing the success of a design solution and develop</td>
<td>7</td>
<td>FS: 2.7, 13.5</td>
<td>CF: 4.2</td>
<td>• FAMU Parking Problem Technology Learning Activity</td>
</tr>
<tr>
<td>proposals for design improvements.</td>
<td></td>
<td>I: 10</td>
<td>FE: 2, 7</td>
<td>• Final Project Documentation</td>
</tr>
<tr>
<td>8) Produce complete free-hand technical sketches of an object to be drawn,</td>
<td>4</td>
<td>FS: 2.3</td>
<td>CF: 4.2</td>
<td>• Lines Technology Learning Activity</td>
</tr>
<tr>
<td>including complete shape description, and correct placement of all necessary</td>
<td></td>
<td>I: 8</td>
<td>FE: 2, 7, 8</td>
<td>• Dimensioning Technology Learning Activity</td>
</tr>
<tr>
<td>dimensions and notes.</td>
<td></td>
<td></td>
<td></td>
<td>• Orthographic Technology Learning Activity</td>
</tr>
<tr>
<td>9) Produce complete and correct orthographic multi-view, isometric, oblique, and</td>
<td>4</td>
<td>FS: 2.3, 2.6</td>
<td>CF: 4.2</td>
<td>• Isometric Technology Learning Activity</td>
</tr>
<tr>
<td>perspective drawings that contain proper dimensions and notes using both CAD and</td>
<td></td>
<td>I: 8, 9, 10</td>
<td>FE: 2, 7, 8</td>
<td>Final Project Documentation</td>
</tr>
<tr>
<td>mechanical drafting techniques.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10) Produce and evaluate mockups and models of designs.</td>
<td>5</td>
<td>FS: 2.3, 2.6&amp;7</td>
<td>CF: 5.5</td>
<td>• Final Project Documentation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I: 8, 9, 10</td>
<td>FE: 7</td>
<td>• Autodesk Inventor Tutorials</td>
</tr>
<tr>
<td>Dispositions/Professionalism</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>11) Implement knowledge and skills to produce 6-12 lab activities in future</td>
<td>1, 3, 4</td>
<td>FS: 12.7</td>
<td>CF: 4.3, 6.2</td>
<td>• Final Project Documentation</td>
</tr>
<tr>
<td>Technology Education Classrooms.</td>
<td></td>
<td>I: 6</td>
<td>FE: 4,11</td>
<td>• Lesson Plan</td>
</tr>
<tr>
<td>12) Integrate and use STEM principles as they apply to technical drawing,</td>
<td>5</td>
<td>FS: 12.6 &amp;7</td>
<td>CF: 5.5</td>
<td>• Final Project Documentation</td>
</tr>
<tr>
<td>engineering design use, and assessment.</td>
<td></td>
<td>I: 3</td>
<td>FE: 7</td>
<td>• Lesson Plan</td>
</tr>
<tr>
<td>13) Produce documentation (design processes, lesson plans, etc.) that is aligned</td>
<td>9</td>
<td>FS: 12.4</td>
<td>CF: 5.3</td>
<td>• Final Project Documentation</td>
</tr>
<tr>
<td>with current state and national technology standards.</td>
<td></td>
<td>I: 6</td>
<td>FE: 3, 7</td>
<td>• Lesson Plan</td>
</tr>
<tr>
<td>14) Continue to develop safety habits and laboratory management techniques.</td>
<td>9</td>
<td>FS: 11</td>
<td>CF: 5.3</td>
<td>• Final Project Documentation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I</td>
<td>FE: 3, 7</td>
<td>• Instructor Observation</td>
</tr>
<tr>
<td>15) Continue to develop a professional portfolio</td>
<td>6, 9</td>
<td>FS: 14.5 &amp; 6</td>
<td>CF: 2.1</td>
<td>• TaskStream Artifacts Submissions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>I: 4</td>
<td>FE: 3, 4, 7, 12</td>
<td></td>
</tr>
</tbody>
</table>
Academic Learning Compact

This course falls under the courses offered in the Department of Workforce Education and Development and is thus covered by the associated Academic Learning Compacts (ALCs). ALCs answer three basic questions: What will students learn by the end of their academic programs? Have they learned what they have been taught by their professors? How do we measure these quantities? For details regarding the Department of Workforce Education and Development, ALCs, go to: http://www.famu.edu/assessment and click on Academic Learning Compacts.

Overall Goals of the Course

The overall goal of this course is to prepare candidates to become creative problem solvers and reflective practitioners within the content area of Technology Education provided within the course.

Topical Outline

1. Sketching and Shape Description
   A. Straight lines
   B. Circles and arcs
   C. Proportions
   D. Sketching on cross section paper
   E. Generating technical designs
      a. Dots
      b. Lines
      c. Shapes
      d. Tone
      e. Texture

2. Elements of Design
   A. Line
   B. Shape
   C. Form
   D. Geometry
   E. Texture
   F. Color
   G. Harmony and contrast
   H. Size and weight
   I. Proportion
   J. Balance
   K. Pattern

3. Design Process
   A. Generating Ideas
      a. Ideation
      b. Brainstorming
   A. Refining Ideas
   B. Selecting Final Idea
   C. Generating Final Designs
   D. Protecting Designs
      a. Patents
      b. Copyrights
      c. Trademarks
      d. Registering a Name

4. Human Considerations
   A. Human Interaction
      a. Human and Environment
      b. Human and Workspace
      c. Human and Machine

5. Design Characteristics
   A. Form
      a. Physical Structures
      b. Structural Principles
      c. Modular Design
   B. Function
      a. Meaning
      b. Value
   C. Aesthetics
      a. Appearance
      b. Colors
      c. Shape
      d. Styling

6. Design Principles
   A. Balance
   B. Harmony
   C. Proportion
   D. Rhythm
   E. Dominance
   F. Movement
   G. Unity

7. Drawing Principles (Manual and CAD)
   A. 2-Dimensional Drawings
      a. Orthographic
      b. Sectioning
      c. Auxiliary views
      d. Pattern Developments
   B. 3-Dimensional Drawings
      a. Isometric
      b. Perspective
      c. Oblique

8. Communicating Designs
   A. Ideation
   B. Notes and Dimensions
   C. Record keeping
   D. Journaling
   E. Making Design Presentations
   F. Lettering
   G. Technical Illustration
   H. Producing and Evaluating Mockups and Models
   I. Portfolio Organization

9. Teaching Communicating Technical Designs
   A. Design Process
   B. Teaching Sketching
   C. Design Briefs
   D. Teaching CAD
   E. Teaching Manual Drafting
   F. Mockups and Models
A variety of methods may be employed, including, but not limited to: lecture/discussion, field experience, guest speakers, audiovisual materials, computer applications, demonstrations, presentations and lab activities. This course will have a Blackboard component, and students must read relevant sections in current outside resources, including web-based documents and word-process assignments and have regularly available email, Internet and World Wide Web access. Documentation and artifacts for TaskStream are required.

**Methods of Evaluation**

1. Technology Learning Activities
2. Discussion Boards
3. Midterm and Final Examinations
4. Research Paper
5. Autodesk Inventor Tutorials
6. Lesson Plan
7. Portfolio
8. Presentation Evaluation

**Grading:**
Grades will be determined using a percentage of total points. The grading scale, with minimum percentages for each grade is provided below. This grading scale will be applied to individual evaluated activities as well as to the student’s final grade.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Points</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technology Learning Activity Assignments (5)</td>
<td>50</td>
<td>90-100%</td>
</tr>
<tr>
<td>Autodesk Inventor Tutorials (7)</td>
<td>350</td>
<td>A</td>
</tr>
<tr>
<td>Blackboard Discussion Boards (2)</td>
<td>50</td>
<td>80-90%</td>
</tr>
<tr>
<td>Final Project</td>
<td>100</td>
<td>70-80%</td>
</tr>
<tr>
<td>Final Project Portfolio</td>
<td>100</td>
<td>60-70%</td>
</tr>
<tr>
<td>Class Presentation</td>
<td>50</td>
<td>Below 59%</td>
</tr>
<tr>
<td>Research Paper</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Midterm</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Final Exam</td>
<td>150</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1000 pts</td>
<td></td>
</tr>
</tbody>
</table>

**Course Policies**

**Policy Statement on Non-Discrimination** It is the policy of Florida Agricultural and Mechanical University to assure that each member of the University community be permitted to work or attend classes in an environment free from any form of discrimination including race, religion, color, age, disability, sex, marital status, national origin, veteran status and sexual harassment as prohibited by state and federal statutes. This shall include applicants for admission to the University and employment.

**Academic Honor Policy** The University’s Academic Honor Policy is located in the FANG Student Handbook, under the Student Code of Conduct-Regulation 2.012 section, beginning on page 55-56.

**ADA Compliance** To comply with the provisions of the Americans with Disabilities Act (ADA), please advise instructor of accommodations required to insure participation in this course. Documentation of disability is required and should be submitted to the Learning Development and Evaluation Center (LDEC). For additional information please contact the LDEC at (850) 599-3180.

**Dispositions** As a component of student assessment, the College of Education has instituted a system for monitoring the professional dispositions: Professionalism, Effective Communication, Respectful Behavior, Ethical Behavior, and Reflective Behavior. At the end of each semester each instructor will fill out an assessment instrument for each student which will be turned in to the department chair and kept in the student’s file. If a problem arises during the semester, a disposition feedback form may be completed by an instructor or school personnel and turned in to the student’s department chair. The severity of the behavioral deficiency will influence the chairperson’s handling of the situation. (See Assessment Instrument for Dispositions and Disposition Feedback Form for more detailed information. This policy includes provisions for professional dress, attendance, punctuality, use of cell phones, etc.)
Course Requirements

1. **Attendance:** Attendance is required for all class meetings. It is the responsibility of the student to make up any work/assignments missed due to illness or personal excuses. The student’s final grade will be reduced one letter grade for each absence beyond two unexcused absences. All excused absences must be reported to and verified through the FAMU academic affairs office.

2. **Final Exam:** There will be a comprehensive exam at the end of the course.

3. **Computer/Web/Email Applications:** A variety of graded activities in this course will be conducted using email, the web and BlackBoard. Students are required to use their FAMU email/Blackboard account and to know how to use file attachment features. Also, students must use Microsoft® Word® for all word-processed files, and will prepare a Microsoft® PowerPoint® presentation, and must be able to use an Internet browser. Some web-based resources will be formatted as PDF files. Students should have access to and know how to use Adobe® Acrobat Reader®. Grades will be posted on BlackBoard. Computer access for students is provided at a number of locations on campus. Students may access their FAMU email from other email accounts or computer systems that are not on the FAMU campus. However, it is the student’s responsibility to make sure the email and other computer systems are operational.

4. **Spelling:** Correct spelling is required for all work. Spelling a word incorrectly on any graded item will result in a loss of one-half point for each time the word is misspelled.

5. **Writing Assignments:** Students will complete several writing assignments. Writing assignments must be word-processed using Microsoft® Word®.

6. **Portfolio:** Students are required to purchase a TaskStream account. Three assigned artifacts must be uploaded to your TaskStream portfolio to pass this class.

7. **Professionalism:** Students are expected to conduct themselves in a professional manner at all time while in class. Evaluation of the student’s professionalism will be an important part of the assessment program in this course.

8. **Reading:** Students are expected to read handouts, web pages, web-based documents, etc. to prepare for lectures, quizzes and tests; as well as prepare for research and writing activities through reference reading.

9. **Research:** Several evaluated activities require the student to conduct research. Under normal conditions, the University library resources will meet all the student’s research needs. Internet research activities will also be conducted.

10. **Safety:** It is the student’s responsibility to adhere to and practice proper safety procedures in the use and operation of the tools, materials, machines, and processes required in this course. Safety eyewear is required when working in any technology labs during course or when participating in hands-on lab experiences. **All students must provide and use their own personal safety eyewear**. Students will not be permitted to work in any Technology Education laboratory without approved safety eyewear - no exceptions.

11. **Laboratory:** This class has an integrated lecture and lab. Some days may be all lectures or all labs or a combination of both depending on the class progress and activities.

12. **Presentations:** Students will prepare and deliver one presentations. Presentations must be supported by multimedia (typically PowerPoint). Students will also make several informal presentations during class as part of a group or as an individual.

13. **Deadlines:** All evaluated activities must be submitted on the deadlines identified. Ten percent (10%) will be deducted from the student’s grade for each day the activity is submitted late.

14. **Plagiarism and Ethical Behavior:** Students are expected to do their own work and act respectfully to each other and most importantly, the instructor. If student are caught cheating in any way, they may receive a failing grade for the course, dismissal from the program or dismissal from the University.

FAMU Technology Education Student Equity Statement:

Florida A&M University is committed to the human rights, dignity and social equity of all individuals; therefore, in accordance with University policy, the Technology Education Program will maintain a “no tolerance” policy with regard to behavior associated with: sexual connotations, physical gestures, inappropriate language or graphics on clothing. As potential future teachers, it is the expectation of the Technology Education Faculty that all Technology Education Majors and those who are enrolled in Technology Education classes reflect strong professional integrity and act in a manner worthy of the University and the Technology Education Program. The Technology Education Faculty will address any issues according to the University policy in order to create a safe and comfortable learning environment for all students.

- If a student feels that any misconduct as described above has occurred against them, witnesses, or is told of an incident of perceived misconduct then he/she should report the incident to the Equal Opportunity Programs Office. Reports of any incidents will be held in the strictest of confidence. Contact Info: Equal Opportunity Programs Office 676 Ardelia Court Tallahassee, FL 32307 (850) 599-3076/3219.
Laboratory Projects and Assignments

Laboratory Projects
There will be seven class laboratory projects throughout the semester, in addition to your final lab project. Each project is designed to provide you with the basic technological skills that you will be using throughout your future courses within the Technology Education Program. Furthermore, each project will incorporate a standards based component that will assist you when designing your final project. The projects will be based on current Technology Education activities taught in contemporary classrooms. There are two distinct lab activities within this course. One is free hand drawing and the other is computer-based drawing. The freehand drawing labs are designed to assist you with the various freehand drawing Technology Learning Activities (see below) and aspects of your final project. The computer-based drawing labs are also designed to assist you with your final project. Both are essential foundations to most of the future lab projects within the FAMU Technology Education Program Curriculum. Additionally, successful completion of these labs will be a vital component to your becoming a well-rounded Technology Educator, as you will ultimately be transferring this content knowledge to your future classrooms.

- Autodesk Inventor Tutorials
  1. Opening a Student Account – In this tutorial you will be introduced to:
     a. Registering for an account in the Autodesk Education Website
     b. Navigating through the tutorials
     c. Saving and printing drawings
  2. Getting Started with Inventor – In this tutorial you will be introduced to:
     a. Autodesk Inventor User Interface
     b. View Manipulation
     c. Designing Parametric Parts
  3. Basic View Creation – In this tutorial you will be introduced to:
     a. A production-ready drawing and its purpose
     b. The process for creating production-ready drawings
     c. The different areas of the drawing creation environment
     d. Navigating the drawing creation environment
  4. Basic Sketching Techniques – In this tutorial you will be introduced to:
     a. Creating 2D sketch geometry using sketch tools
     b. Options for aligning geometry in 2D sketches
     c. Reorienting the initial sketch to a different plane
     d. The use of sketch tools to create sketch geometry
  5. Basic Shape Design – In this tutorial you will be introduced to:
     a. Creating basic sketch features
     b. Using the Extrude tool to create extruded features
     c. Using the Revolve tool to create revolved features
     d. Using the Operation and Extent termination options when adding 3D features
     e. Orienting sketch planes based on other planes or faces
  6. Placing, Creating, and Constraining Components – In this tutorial you will be introduced to:
     a. Creating components in an assembly
     b. The process of placing components in an assembly
     c. Use the Place Component tool to place parts into an assembly
     d. Editing components in the context of an assembly
  7. Dimensions, Annotations, and Tables – In this tutorial you will be introduced to:
     a. The use and function of retrieved dimensions
     b. Retrieving model dimensions for use in drawing views
     c. Positioning model dimensions, adding text and symbols, and editing model dimension values
  8. Drawing Standards and Resources – In this tutorial you will be introduced to:
     a. Different styles and their role in drawing standards
     b. The use and function of drawing standards
     c. Creating drawing sheets, custom borders and title blocks

Course Objective 5: FAMU CF: 2.5; FEAPS: 4, 12; FSAC: 2.1, 11.5; ITEEA 8, 9, 10; INASC: 6
Course Objective 9: FAMU CF: 4.5, 4.5; FEAPS: 2, 7, 8; FSAC: 2.3, 2.6; ITEEA 8, 9, 10; INASC: 4
Course Objective 10: FAMU CF: 5.5; FEAPS: 7; FSAC: 2.3, 2.6, 2.7; ITEEA 8, 9, 10; INASC: 5

- Laboratory Safety
You are expected to conduct yourself in a safe manner at all times when working in the Technology Education Labs. Failure to practice safety will result in removal from the lab and possible additional disciplinary action depending on the infraction.

Course Objective 14: FAMU CF: 5.3; FEAPS: 3, 7; FSAC: 11; ITEEA 12, 13; INASC: 9
Assignments

Discussion Boards
You will have two discussion board assignments throughout the semester. Through discussion boards, you will identify and self-reflect with regard to your views and opinions regarding technology education issues such as standards, philosophies, and technology as it relates to different grade levels. Information will be provided related to discussion board topics: however, critical thinking on your part to express your opinions and views are essential. Furthermore you will demonstrate your professional skills by responding to your peer’s discussion board responses. The following topics will be on the discussion boards:

Discussion Board 1: Design Methods used in Industry video: During the video write down 10 questions you might ask a High School class that reflect key points within the video. Post your questions on Blackboard. Look at least two of your classmate’s postings and answer their questions through the “reply” feature of the discussion board.

Discussion Board 2 – Technology Education Design Methods – Technology Education Curriculums all discuss attributes of design. Design methods are a critical part of a student being able to make their ideas a reality. There are several design methods that can be used in a Technology Education Classroom. Conduct an online search for different design methods, compare and contrast the “Technological Design Method” and the “Engineering Design Method” used in Technology Education classrooms. 250 words minimum and be sure to post the link you used to formulate this discussion. Look at least two of your classmate’s postings and comment on their findings through the “reply” feature of the discussion board.

Technology Learning Activities
You will have five Technology Learning Activities throughout the semester. The Technology Learning Activities are designed to identify characteristics of a professional teacher and compare them to your individual characteristics in addition to relating them to professional certification requirements, organizations, standards and opportunities within technology education field.

Technology Learning Activity 1 – FAMU Parking Problem Technology Learning Activity. As an introduction to design, your team will present a solution to the FAMU Parking problem. This Technology Learning Activity is designed to assess your basic understanding of design and problem solving skills that are a vital part of contemporary Technology Education classrooms and are an essential component to your becoming an effective and informed Technology Educator.

Technology Learning Activity 2 – Lines Technology Learning Activity. Your knowledge of basic lines used in technical drawings is an important foundational component to becoming competent in drafting principles and methods. You will explore and draw the different lines that are inherent in most technical drawings. These include: visible edge and outline lines, dimension lines, hidden lines, etc. Additionally, the aspects of this Technology Learning Activity will be of great use to the Autodesk Inventor Tutorials and your Final Project.

Technology Learning Activity 3 – Dimensioning Technology Learning Activity. Your knowledge of basic dimensioning procedures used in technical drawings is an important foundational component to becoming competent in drafting principles and methods. You will explore and draw different dimensioning lines used to describe the sizes and relationships between features in different drawings. These include: basic dimension lines, extension lines, leaders, dimension offsets or gaps, centerlines, finish marks, baselines, and chained dimensioning. Additionally, the aspects of this Technology Learning Activity will be of great use to the Autodesk Inventor Tutorials and your Final Project.
Technology Learning Activity 4 – *Orthographic Technology Learning Activity*. Your knowledge of basic orthographic drawings is an important foundational component to becoming competent in drafting principles and methods. You will explore and draw different shapes and products and describe the basic components of orthographic drawings. These include: front, top, and side views in addition to orthographic dimension and orthographic parallel projection. Additionally, the aspects of this Technology Learning Activity will be of great use to the Autodesk Inventor Tutorials and your Final Project.

### Course Objective

| Course Objective 8: FAMU CF: 4.2, 4.5; FEAPS: 2, 7, 8; FSAC: 8.1; ITEEA: 13, 18; INTASC: 4 |
| Course Objective 9: FAMU CF: 4.5, 4.5; FEAPS: 2, 7, 8; FSAC: 2.3, 2.6; ITEEA 8, 9, 10; INASC: 4 |

Technology Learning Activity 5 – *Isometric and Prospective Technology Learning Activity*. Your knowledge of basic isometric drawings and prospective drawing techniques are an important foundational component to becoming competent in drafting principles and methods. You will explore and draw different shapes and products and describe the basic components of isometric and projection techniques. These include: 2 Point vs 3 Point Perspectives in addition to diametric and trimetric perspectives and Cartesian coordinate skills. Additionally, the aspects of this Technology Learning Activity will be of great use to the Autodesk Inventor Tutorials and your Final Project.

### Course Objective

| Course Objective 8: FAMU CF: 4.2, 4.5; FEAPS: 2, 7, 8; FSAC: 8.1; ITEEA: 13, 18; INTASC: 4 |
| Course Objective 9: FAMU CF: 4.5, 4.5; FEAPS: 2, 7, 8; FSAC: 2.3, 2.6; ITEEA 8, 9, 10; INASC: 4 |

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**Research Paper**

**Research Focus**
This assignment allows you to develop an interest and knowledge base pertaining to an area of design methods of your choice not covered in class. The focus of this assignment is on contemporary or futuristic design process. Historical studies are not acceptable for this project; however, a component of historical background is acceptable. This paper should be the catalyst for your final project.

**Assignment Requirements**
The goal for this assignment is to develop a *quality* research project that you will be proud to use as a teaching aid in your future classroom. Your research should include and describe impacts of the poor design methods, descriptions of basic tools used to bring an idea from conception to a final product. Additionally describe the tools (Freehand Drafting and CAD applications) used when designing. Additionally link your research to technology systems and other subject areas (STEM, language arts, social studies, etc.). Your topic must be **pre-approved**.

**Classroom Equation** – Explain ways this material would be relevant in a Technology Education Classroom.

The paper should be word-processed, 12 point type, Times or Arial regular font, .75-inch margins all around, line spacing of 1.5, and not exceed three pages. APA formatting is required with a minimum of five citations. Papers will be submitted to Blackboard and will be checked on TurnItIn.com, so do not plagiarize.
Final Project

The goal for this assignment is to develop a quality research project by producing a tangible 3-D model or prototype of a product that you have designed. This should be an activity that can be done in either a Technology Education High or Middle school setting and that you will be proud to use as a teaching aid in your future classroom. You may collaborate with no more than 2 other classmates. Identification of your topic should be done as soon as possible, and must be approved in advance. Project presentations will be given during the last week of classes.

You will be provided several research sources to produce your activity. Along with the physical project, you will produce a project portfolio with complete documentation. The portfolio must be typed and presented in a clear-bound folder. Neatness will count heavily on your portfolio presentation. The final project portfolio must include the following components:

- **A Detailed Design Brief:**
  The following should be included in your design brief:
  A Background and Rationale for the Project; A Problem Statement; Evidence of Research; Time Constraints and an Evaluation Summary. Additionally, describe the social and economic impacts of the product or process. Also describe the links to other technology systems and other subject areas (e.g. STEM, social studies, etc.).

  Course Objective 6: FAMU CF: 4.2; FEAPS: 2, 7; FSAC: 2.7, 13.3; ITEEA: 9, 10; INTASC: 7
  Course Objective 12: FAMU CF: 5.5; FEAPS: 7; FSAC: 12.6, 12.7; ITEEA 3; INASC: 5

- **Lesson Plan Outline:**
  For your final project portfolio, you will produce a lesson plan that will identify basic components that will assist in your potential students learning. You will be exposed to several different Technology Education lesson plans (available via Blackboard) and relate them to you’re your final project. You must include what Sunshine State and National standards will apply, materials needed, and an assessment instrument (quiz, test, Technology Learning Activity, etc.).

  Course Objective 11: FAMU CF: 5.5; FEAPS: 7; FSAC: 12.7; ITEEA 6; INASC: 5
  Course Objective 12: FAMU CF: 5.5; FEAPS: 7; FSAC: 12.6, 12.7; ITEEA 3; INASC: 5
  Course Objective 13: FAMU CF: 5.5; FEAPS: 7; FSAC: 12.4; ITEEA 6; INASC: 9
  Course Objective 14: FAMU CF: 5.3; FEAPS: 3, 7; FSAC: 11; ITEEA 12, 13; INASC: 9

- **Detailed Drawings:**
  For your final project portfolio, you will produce detailed drawings that include: orthographic drawings (front, top and side views), and an isometric view produced in Autodesk Inventor.

  Course Objective 3: FAMU CF: 2.3; FEAPS: 12; FSAC: 2.4; ITEEA: 10; INASC: 1, 6
  Course Objective 8: FAMU CF: 4.2, 4.5; FEAPS: 2, 7, 8; FSAC: 8.1; ITEEA: 13, 18; INTASC: 4
  Course Objective 9: FAMU CF: 5.5; FEAPS: 7; FSAC: 13.2; ITEEA: 3; INTASC: 6
  Course Objective 13: FAMU CF: 5.5; FEAPS: 7; FSAC: 12.4; ITEEA 6; INASC: 9

- **Class Presentation**
  **Presentation Criteria:** You will produce a class presentation that relates to your final project. Your presentation should engage your audience in all aspects of your project. You should develop a quality presentation that you will be proud to use as a teaching aid in your future classroom. Additionally, this will help you to continue to develop the public speaking skills all educators need to teach. The format must be in PowerPoint, and you will make a presentation no longer than 15 minutes and no shorter than 10 minutes.

  Course Objective 11: FAMU CF: 5.5; FEAPS: 7; FSAC: 12.7; ITEEA 6; INASC: 5
  Course Objective 12: FAMU CF: 5.5; FEAPS: 7; FSAC: 12.6, 12.7; ITEEA 3; INASC: 5
  Course Objective 13: FAMU CF: 5.3; FEAPS: 3, 7; FSAC: 12.7; ITEEA 3; INTASC: 9
  Course Objective 14: FAMU CF: 5.3; FEAPS: 3, 7; FSAC: 11; ITEEA 12, 13; INASC: 9
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<th>Week</th>
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<td><strong>Course Calendar - Tentative</strong></td>
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<td><strong>Week 1</strong></td>
<td><strong>Introduction and Orientation</strong>&lt;br&gt;<strong>Course Syllabus</strong>&lt;br&gt;<strong>Lecture: What is a Design?: A Closer Look at the Design Process</strong></td>
<td><strong>Review the PowerPoints:</strong> Communicating Technical Designs &amp; Gathering Information; Characteristics of a Good Design. Read Chapters 1 &amp; 2 of the Text. Be prepared to discuss these topics in class. &lt;br&gt;FAMU Parking Problem Technology Learning Activity*</td>
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<td><strong>Week 2</strong></td>
<td><strong>Lecture: Communicating Technical Designs</strong>&lt;br&gt;<strong>Lecture: Gathering Information; Characteristics of a Good Design</strong>&lt;br&gt;<strong>Video:</strong> Design Methods used in Industry</td>
<td><strong>Review the PowerPoint:</strong> Types of Lines in Technical Drawings. Read Chapters 3 &amp; 5 of the Text. Be prepared to discuss these topics in class. &lt;br&gt;Lab: Freehand Sketching – Getting Started: Tools needed to creating freehand drawings &lt;br&gt;Discussion Board 1</td>
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<td><strong>Week 3</strong></td>
<td><strong>Lecture: Types of Lines in Technical Drawings</strong></td>
<td><strong>Review the PowerPoint:</strong> Types of Drawings and Dimensioning. Read Chapters 6 &amp; 7 of the Text. Be prepared to discuss these topics in class. &lt;br&gt;Lab: Freehand Sketching Practice &lt;br&gt;Lines Technology Learning Activity</td>
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<td><strong>Week 4</strong></td>
<td><strong>Lecture: Types of Drawings and Dimensioning</strong>&lt;br&gt;<strong>Lecture: Getting Started with Inventor</strong></td>
<td><strong>Review the PowerPoint:</strong> Technical Drawing Views. Read Chapter 8, of the Text. Be prepared to discuss these topics in class. &lt;br&gt;Lab: The Autodesk Inventor Environment – Setting up your account &lt;br&gt;Dimensioning Technology Learning Activity</td>
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<td><strong>Week 5</strong></td>
<td><strong>Lecture: Technical Drawing Views</strong>&lt;br&gt;<strong>Lecture: Getting Started with Inventor</strong></td>
<td><strong>Review the PowerPoint:</strong> Traditional and CAD Drawings; Read Chapter 9 of the Text. Be prepared to discuss these topics in class &lt;br&gt;Lab: Autodesk Inventor Tutorial – Getting Started with Inventor &lt;br&gt;Introduction to Research Paper &lt;br&gt;Orthographic Technology Learning Activity</td>
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<td><strong>Week 6</strong></td>
<td><strong>Lecture: Traditional and CAD Drawings</strong></td>
<td><strong>Review the PowerPoint:</strong> STEM and Technical Drawing; Read Chapter 10 of the Text. Be prepared to discuss these topics in class &lt;br&gt;Lab: Autodesk Inventor Tutorial – Basic View Creation &lt;br&gt;Isometric Technology Learning Activity</td>
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<td><strong>Week 7</strong></td>
<td><strong>Lecture: STEM and Technical Drawing</strong>&lt;br&gt;<strong>Review For Midterm</strong></td>
<td>Lab: Autodesk Inventor Tutorial – Basic Sketching Techniques</td>
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<td><strong>Week 8</strong></td>
<td><strong>Midterm</strong></td>
<td><strong>Review the PowerPoint:</strong> Teaching Technical Drawing and Design in the Technology Education Classroom; Read Chapters 11 &amp; 12 of the Text. Be prepared to discuss these topics in class. &lt;br&gt;Lab: Autodesk Inventor Tutorial - Basic Shape Design</td>
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<td><strong>Week 9</strong></td>
<td><strong>Lecture: Teaching Technical Drawing and Design in the Technology Education Classroom</strong></td>
<td><strong>Review the PowerPoint:</strong> Why is Educating Students About Design Important?; Read Chapter 15 of the Text. Be prepared to discuss these topics in class &lt;br&gt;Lab: Autodesk Inventor Tutorial - Placing, Creating, and Constraining Components &lt;br&gt;Discussion Board 2</td>
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<td><strong>Week 10</strong></td>
<td><strong>Lecture: Why is Educating Students About Design Important?</strong></td>
<td><strong>Review the PowerPoint:</strong> Project Based Learning; Read Chapter 15 of the Text. Be prepared to discuss these topics in class. &lt;br&gt;Lab: Autodesk Inventor Tutorial - Dimensions, Annotations, and Tables</td>
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<td><strong>Week 11</strong></td>
<td><strong>Lecture: Project Based Learning</strong></td>
<td><strong>Review the PowerPoint:</strong> Modeling Techniques; Read Chapter 15 of the Text. Be prepared to discuss these topics in class. &lt;br&gt;Lab: Autodesk Inventor Tutorial - Drawing Standards and Resources*</td>
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<td><strong>Week 12</strong></td>
<td><strong>Lecture: Modeling Techniques</strong></td>
<td><strong>Review the PowerPoint:</strong> An Introduction to Transportation Systems; Read Chapter 15 of the Text. Be prepared to discuss these topics in class &lt;br&gt;Lab: Introduction to Final Project – Inventor Drawing and Product*</td>
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<td>Lab: Final Project</td>
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<td><strong>Week 16</strong></td>
<td><strong>Review for Final Examination</strong></td>
<td>Lab: Final Project Critique (Class Presentation)* &lt;br&gt;ALL WORK DUE</td>
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<td><strong>Week 17</strong></td>
<td><strong>Final Exam</strong></td>
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* All Lab and Assignment Criteria Available via Blackboard
* Denotes TaskStream Artifact Submission
**References and Supplementary Materials**

**Syllabus Reference Materials:**

- California University of Pennsylvania ([http://www.cup.edu](http://www.cup.edu))
- Florida Department of Education Website ([http://www.fldoe.org](http://www.fldoe.org))
- Florida Technology Education Association Website ([http://www.ftea.com](http://www.ftea.com))
- International Technology Education Association ([http://www.ITEEAconnect.org](http://www.ITEEAconnect.org))

**On-line Student Reference:**

BBC Design and Technology: Drawing 1
http://www.bbc.co.uk/schools/gcsebitesize/design/graphics/drawingsketchingrev1.shtml
British Council CUBED http://www.britishcouncil.org/science-cubed.htm

**References:**


## College of Education
### Student Professional Dispositions
#### Fall 2010

**Candidate’s Name:** _____________________  **Student ID:** __________  **Program Area:** ______________

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<td>The candidate <strong>sometimes</strong> and <strong>adequately</strong> demonstrates indicators of performance. (79-70%)</td>
<td>The candidate <strong>rarely or never</strong> and <strong>inappropriately or superficially</strong> demonstrates indicators of performance.</td>
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**Professionalism: The Teacher Candidate demonstrates professionalism**

(Please use a √ to indicate level of performance.)

**Outcome**

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- **Punctuality**
  - Does not exceed three unexcused absences, per university catalog 2009-2010
  - In class at or before specified time, per Registrar
  - Attends class, field experiences, meetings
  - Appropriate dress and grooming
  - Completes assignments on or before due date
  - Emotional Management
    - Handles feeling appropriately
    - Reacts reasonably to situations
    - Finds a healthy balance between emotions
  - Demonstrates the appropriate use of personal technology during class
  - Follows established protocol and procedures
  - Follows established procedures and policies

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**Effective Communication: The Teacher Candidate demonstrates effective communication skills**

(Please use a √ to indicate level of performance.)

- Uses standard English language in various settings
- Uses appropriate tone of voice for the setting
- Clearly articulates concepts (avoids words such as you know, um, uh-uh, and okay)
- Models appropriate respectful communication that is not demeaning or harmful (avoids loud outbursts and profanity)
- Avoids confrontational behavior

**Outcome**

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Respectful Behavior: The Teacher Candidate demonstrates respectful behavior  
(Please use a ✓ to indicate level of performance.)

- Considers opinions of others with an open mind (respects diversity)
- Listens to others in a variety of settings
- Provides equitable learning opportunities for all
- Considers background interests and attitudes
- Reacts reasonably to situations (avoids verbal confrontational behavior)

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Ethical Behavior: The Teacher Candidate demonstrates ethical behavior  
(Please use a ✓ to indicate level of performance.)

- Demonstrates academic honesty
  - Avoids plagiarizing
- Demonstrates honesty inside and outside of the classroom
- Demonstrates trustworthiness
- Understands the importance of professional code of ethics
- Advocates fairness

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Reflective Behavior: The Teacher Candidate demonstrates reflective behavior  
(Please use a ✓ to indicate level of performance.)

- Accepts feedback and suggestions, and incorporates in subsequent practice in various settings
- Demonstrates accurate self-analysis regarding ones strengths and weaknesses

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