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**MEMORANDUM**

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TO: Curriculum Committee

FROM: Jack Kirby 

DATE: March 28, 2013

SUBJECT: Curriculum Proposal #12-13-54, REVISION #1  
Engineering Technology Courses  
Final Faculty Senate Approval 4/9/2013

I recommend approval of the attached REVISION #1 of Curriculum Proposal #12-13-54 from the College of Science and Technology, Department of Technology. This proposal is now ready for faculty senate.






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**MEMORANDUM**

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TO: Curriculum Committee  
FROM: Jack Kirby   
DATE: March 1, 2013  
SUBJECT: Curriculum Proposal #12-13-54  
Engineering Technology Courses

I recommend approval of the attached Curriculum Proposal #12-13-54 from the College of Science and Technology, Department of Technology.

This proposal adds TECH 1108 and TECH 2208 to the Engineering Technology programs for ABET accreditation. In addition, TECH 1108 will be used in the Technology Education BS degree.

c: Dr. Christina Lavorata  
Dr. Anthony Gilberti  
Ms. Evie Brantmayer  
Ms. Leslie Lovett



**CURRICULUM PROPOSAL** (Submit one hard copy and an electronic copy to the Associate Provost by the second Tuesday of the month.)

Proposal Number: 12-13-54

School/Department/Program: College of Science and Technology/Technology

Preparer/Contact Person: Anthony F. Gilberti

Telephone Extension: 4887

Date Originally Submitted: February 25, 2013

Revision (Indicate date and label it  
Revision #1, #2, etc.): \_\_\_\_\_

Implementation Date Requested: Fall 2013

I. **PROPOSAL.** Write a brief abstract, not exceeding 100 words, which describes the overall content of the proposal.

This proposal adds two new courses to the Engineering Technology programs of study. These courses are TECH 1108, Engineering Graphics I, 3 credits, and TECH 2208, Engineering Graphics II, 3 credits. The addition of these two courses will allow the Engineering Technology programs to meet ABET outcomes and collect assessment data necessary to maintain ABET accreditation. In addition, TECH 1108 will be used in the Technology Education B.S. degree.

II. **DESCRIPTION OF THE PROPOSAL.** Provide a response for each letter, A-H, and for each Roman Numeral II-V. If any section does not apply to your proposal, reply N/A.

- A. Deletion of course(s) or credit(s) from program(s)  
The following courses will be deleted from the Civil Engineering Technology Programs:  
DRFT 2200 Fundamentals of CAD, 3 Cr. – from the A.S. and BSET programs

Total hours deleted. 3 credit hours

The following courses will be deleted from the Electronics Engineering Technology Programs:  
DRFT 1100 Engineering Graphics, 3 Cr. – from the A.S. and BSET programs

Total hours deleted. 3 credit hours

The following courses will be deleted from the Mechanical Engineering Technology Programs:  
DRFT 1100 Engineering Graphics, 3 Cr. – from the A.S. and BSET programs  
DRFT 2200 Fundamentals of CAD, 3 Cr. – from the A.S. and BSET programs  
DRFT 2235 Technical Drafting, 3 Cr. – from the A.S. and BSET programs

Total hours deleted. 9 credit hours

B. Addition of course(s) or credit(s) from program(s)

The following course(s) is added to the Civil Engineering Technology Programs:  
TECH 1108 Engineering Graphics I, 3 Cr. – added to the A.S. and BSET programs of study

Total hours added. 3 credit hours

The following course(s) is added to the Electronics Engineering Technology Programs:  
TECH 1108 Engineering Graphics I, 3 Cr. – added to the A.S. and BSET programs of study

Total hours added. 3 credit hours

The following course(s) is added to the Mechanical Engineering Technology Programs:  
TECH 1108 Engineering Graphics I, 3 Cr. – added to the A.S. and BSET programs of study  
TECH 2208 Engineering Graphics II, 3 Cr. – added to the A.S. and BSET programs of study

Total hours added. 6 credit hours

C. Provision for interchangeable use of course(s) with program(s)

NA

D. Revision of course content. Include, as an appendix, a revised course description, written in complete sentences, suitable for use in the university catalog.

NA

E. Other changes to existing courses such as changes to title, course number, and elective or required status.

NA

F. Creation of new course(s). For each new course

1. Designate the course number, title, units of credit, prerequisites (if any), ownership (FSU or shared) and specify its status as an elective or required course. If you are creating a shared course, attach a memo from the Deans of the affected Schools explaining the rationale for the course being shared.

TECH 1108, Engineering Graphics I, 3 Cr., Prerequisites: None, ownership: FSU. This is a required course in all Civil, Electronics, and Mechanical Engineering programs of study, and for the Technology Education B.S. degree.

TECH 2208, Engineering Graphics II, 3 Cr. Prerequisites: None, ownership: FSU. This is a required course in all Mechanical Engineering programs.

2. Include, as an appendix, a course description, written in complete sentences, suitable for use in the college catalog.
3. Include, as an appendix, a detailed course outline consisting of at least two levels.
4. In order to meet the requirements as outlined in Goal One of the Strategic Plan, please include Outcome Competencies and Methods of Assessment as an appendix. Examples are available upon request from the Chair of the Curriculum Committee.

Refer to the course outlines as presented in Appendix A and Appendix B

- G. Attach an itemized summary of the present program(s) affected, if any, and of the proposed change(s).

Describe how this proposal affects the hours needed to complete this program. Specifically, what is the net gain or loss in hours? Use the format for Current and Proposed Programs in Appendix A.

The addition of TECH 1108 has no net gain or loss for the Civil, Electronics Engineering Technology programs of study. The same is also true for the Technology Education degree. TECH 1108 simply replaces a course currently being taught by Pierpont Community and Technical College.

The Mechanical Engineering Technology program has been able to reduce the total number of credit hours required in the A.S. and BSET programs by 3 credit hours. This is because we no longer require a board drafting course.

III. **RATIONALE FOR THE PROPOSAL.**

A. **Quantitative Assessment:** Indicate the types of assessment data, i.e., surveys, interviews, capstone courses, projects, licensure exams, nationally-normed tests, locally developed measurements, accreditation reports, etc., that were collected and analyzed to determine that curricular changes were warranted. Quantitative data is preferred.

The Engineering Technology programs are accredited by ETAC of ABET. Pierpont Community and Technical College eliminated their ABET accreditation in December of 2010. As an institution we cannot obtain accreditation information from another institution for courses that we do not administer. Further, the adoption of these two new courses allows the engineering technology faculty to facilitate course material that is directly related to ABET accreditation needs.

B. **Qualitative Assessment:** Based upon the assessment data above, indicate why a curricular change is justified. Indicate the expected results of the change. Be sure to include an estimate of the increased cost, or reduction in cost of implementation. **FOR EXAMPLE:** Will new faculty, facilities, equipment, or library materials be required?

The rationale for adding TECH 1108 and 2208 into our current curriculum offerings is to better prepare our engineering technology students for course work, continuing education, and the requirements for becoming professional engineers. The engineering technology faculty must collect outcome measures for ABET accreditation and the FSU owned course will ensure the needs of the ABET programs are being met.

No new faculty, facilities, equipment or materials will be needed. The added course load will be met using existing resources and faculty already employed by the College of Science and Technology.

IV. Should this proposal affect any course or program in another school, a memo must be sent to the Dean of each school impacted and a copy of the memo(s) must be included with this proposal. In addition, the Deans of the affected schools must sign below to indicate their notification of this proposal.

By signing here, you are indicating your college's/school's notification of this proposal.

College/School	Dean	Signature
Science & Technology	D. Gilberti	Anthony J. Diltal

V. Should this proposal affect any course to be added or deleted from the general studies requirements, a memo from the chair of the General Studies Committee indicating approval of the change must be included with this proposal.

NA

VI. **ADDITIONAL COMMENTS.**

Since curriculum proposals have already been prepared to indicate the inclusion of TECH 1108 and 2208 in the Engineering Technology and Technology Education programs of study, these have not been included in this proposal. Provided are course syllabi with course outcomes for both TECH 1108 and TECH 2208. Specific course outcomes for TECH 1108 can be found on page 3, and course outcomes for TECH 2208 can be found on page 3 of that course syllabi.

## APPENDIX A

**DEPARTMENT:** TECHNOLOGY  
**PROGRAM:** Technology  
**COURSE TITLE:** Engineering Graphics I  
**COURSE NUMBER:** TECH 1108

### **Course Information**

**Course description:** Essentials of engineering graphics for engineering technology students. Content and emphasis of the course is to provide competency in technical sketching, blueprint reading, CAD applications, applied geometry, orthographic projection, section, dimensioning, tolerances, threads and fasteners, weldments, detail and assembly drawing, charting and basic elements of descriptive geometry.

**Course Pre-requisite(s):** None  
**Course Co-requisite(s):** None

**Delivery Method:** The course will be delivered using traditional face-to-face lecture and will be enhanced/managed online utilizing Blackboard. Students will be required to access the course enhancement tools to obtain the course syllabus, assignments, and grades for the course.

**Lecture Information:** 3 credit hours  
**Location:** 113 Engineering Technology Building  
**Meeting day(s):** MW  
**Meeting time(s):** 7:30 – 8:20 am

**Laboratory Information:** None required for this course  
**Location:** N/A  
**Meeting day(s):** N/A  
**Meeting time(s):** N/A

### **Instructor Information**

**Instructor Name:**  
**Email:**  
**Office location:**  
**Office hours:**  
**Phone:**  
**Fax:**

### **Required Course Materials**

**Required Textbook(s):** To be determined

**Optional References:**

**Other Tools/Supplies:** N/A  
**Software:** AutoCad, Word, Excel, Power Point, and internet capability



## **ETAC of ABET Program Objectives**

The ETAC of ABET Accredited Programs at FSU concur with ABET in defining program educational objectives as ***“broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve during the first few years following graduation.”***

- 1. Apply the skills and methodologies to solve problems as an engineering technology professional*
- 2. Use learned technical and non-technical methodologies to communicate to audiences of varying demographics*
- 3. Perform work responsibilities independently or as part of a team, ethically and respectfully*
- 4. Assess the societal and global impact of professional decisions and practices*
- 5. Pursue lifelong learning through professional development*

## **ETAC of ABET Program Outcomes**

The ETAC of ABET accredited Programs concur with ABET in defining Program Outcomes as ***“units of knowledge or skill students are expected to acquire from the program to prepare them to achieve the program educational objectives. These are typically demonstrated by the student and measured by the program at the time of graduation”.***

The Program Outcomes for the ETAC programs are comprised of six (6) established outcomes which encompass ABET’s required a-k and the program specific outcomes.

- 1. Master and apply current knowledge, techniques, skills and modern tools of their disciplines including mathematics and science*
- 2. Identify, analyze and improve technical processes including experimental verification*
- 3. Apply creativity in the design of systems, components or processes appropriate to program objectives including working on teams and communicating effectively*
- 4. Prepare for the ability to engage in lifelong learning, a commitment to quality, timeliness, and continuous improvement*
- 5. Demonstrate an awareness of professional, ethical and social responsibilities, including a respect for diversity and a knowledge of contemporary professional, societal and global issues*
- 6. Solve complex problems utilizing discipline specific expertise.*

## Course Outcomes and Assessment Key

At the conclusion of this course, students will be able to meet the following outcomes:

1. Create orthographic and isometric 2D drawings using an AutoCad workstation
2. Perform dimensioning techniques using AutoCad
3. Use computer-aided drafting or design tools to prepare graphical representations for civil, electrical, or mechanical engineering
4. Navigate the AutoCad user interface to create engineering drawings
5. Store, retrieve, and reproduce engineering drawings to the proper scale
6. Explain the process of setting up time saving drawing fields and template files
7. Utilize AutoCad to create irregular lines and precise patterns of lines
8. Modify existing geometry using AutoCad commands

## Assessment Tools Key

Assessment Number	Assessment Tool	Benchmark*		
		Substandard	Target	Professional
1	Homework/Exams	<70%	70%-90%	≥ 90%
2	Homework/Exams	<70%	70%-90%	≥ 90%
3	Homework/Exams	<70%	70%-90%	≥ 90%
4	Homework	<70%	70%-90%	≥ 90%
5	Presentation	<70%	70%-90%	≥ 90%
6	Homework/Exams	<70%	70%-90%	≥ 90%

\* Note that the benchmark range does not indicate passing or failing. It is an indicator for continuous improvement of the course.

## Learning Objectives Key

### Institutional Assessment of Course:

The institutional assessment will be administered using the IDEA educational assessment format. It is the intent of the instructor to emphasize the following IDEA objectives during the course:

(Scale: M = Minor or no importance, I = Important, E = Essential)

No.	Assessment Category	Scale		
		M	I	E
1.	Gaining factual knowledge (terminology, classifications, methods, trends)		X	
2.	Learning fundamental principles, generalizations, or theories			X
3.	Learning to apply course material (to improve thinking, problem solving, and decisions)			X
4.	Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course		X	
5.	Acquiring skills in working with others as a member of a team	X		
6.	Developing creative capacities (writing, inventing, designing, performing in art, music, drama, etc.)	X		
7.	Gaining a broader understanding and appreciation of intellectual/cultural activity (music, science, literature, etc.)	X		
8.	Developing skill in expressing oneself orally and in writing		X	
9.	Learning how to find and use resources for answering questions or solving problems	X		
10	Developing a clearer understanding, and commitment to, personal values	X		
11.	Learning to analyze and critically evaluate ideas, arguments, and points of view	X		
12.	Acquiring an interest in learning more by asking questions and seeking answers		X	

## Course Outline and Tentative Schedule of Topics

### A. Syllabus review

1. **Engineering design process and documentation**
  - a. **Communicating effectively**
    1. Title block
    2. Lettering
    3. Line types
    4. Geometric construction
    5. Basics of AutoCad program
2. **Sketching**
  - a. **Orthographic sketching**
    1. Orthographic projections

2. Drawing with basic objects
  3. Geometric constructions
  4. Title block
3. **Multiview drawing**
    - a. **Relationships between orthographic views**
      1. Missing lines and views
      2. Isometric sketches
      3. 2-D drawing in AutoCad
  4. **Drawing with precision for engineering drawings**
    - a. **Placing text on a drawing**
      1. Object properties
      2. Layers
      3. Orthographic and isometric drawings, multiview drawings in AutoCad
  5. **Constructing objects**
    - a. **Construction and editing objects**
      1. Isometric drawings in AutoCad
      2. AutoCAD 2D drawing
      3. AutoCad ISO drawing
  6. **Dimensioning**
    - a. **The need for proper dimensioning in engineering graphics**
      1. Auxiliary views
  7. **Blueprint reading**
    - a. **Examples in Civil, Electronics, and Mechanical Engineering**
      1. Introduction to sections and conventions
      2. Auxiliary views
      3. Blueprint reading
      4. AutoCad 2D drawing
  8. **Sections in Autocad**
    - a. **Hatching and Viewports**
      1. Creating Sections
      2. Use of Viewports
  9. **Dimensioning drawings**
    - a. **Dimension styles and dimensioning variables**
      1. Creating an AutoCad 2D drawing with dimensions

10. **Symbols in engineering drawings**
  - a. **Welding, hydraulic, civil, electrical, and mechanical drawings**
    1. AutoCad Design Center
    2. Blocks
    3. Introduction to threads and fasteners
  
11. **Printing Documents**
  - a. **Types of printers and plotters**
    1. Threads and fasteners
    2. Setting parameters and printing correctly
  
12. **2D project in civil, electrical, or mechanical engineering**
  - a. **Creating a project specific to student's program areas**
    1. Creating a final project

## ***Policies/Procedures***

Students enrolled in the Department of Technology programs at Fairmont State University will primarily be concerned with applying established scientific and engineering knowledge and methods combined with technical skills in support of engineering activities.

### **Professionalism and Classroom Etiquette:**

Students will gain the most from this course if they treat it as a work or professional experience. Being prepared in the classroom means reading *and* comprehending all assignments prior to class meetings. Maintaining and organizing class documents will prepare you for future courses and future goals after you leave this program.

- a. *No Tobacco or food is permitted in the Classroom/Laboratories.*
- b. *Closed drinking containers are permitted in the classroom.*
- c. *Observe proper Cell Phone etiquette during class*
- d. *Professionalism*
- e. *Honor code*
- f. *Attendance/tardy*
- g. *Examination policy*
- h. *Dress code (Hats will be removed during Class)*
- i. *Student work submitted for grade*
- j. *Presentations*

**Disability Services:** Services are available to any student, full or part-time, who has a need because of a [documented] disability. It is the student's responsibility to register for services with the coordinator of students with disabilities and to provide any necessary documentation to verify a disability or the need for accommodations. The Coordinator of Disability Services, Andrea Pammer, is located in Colebank Hall 307. The office phone is (304) 367-4686. TTY 304-367-4906. Her e-mail is [apammer@fairmontstate.edu](mailto:apammer@fairmontstate.edu)

### **Additional Policy Statements from the Office of Academic Affairs:**

In keeping with the Department of Technology program's goal of professional development and conduct, the attached link further expresses the information regarding integrity, student disability services and expectations of students:

<http://www.fairmontstate.edu/AcademicAffairs/SyllabusStatements.asp>

## **Student Responsibilities**

### **Student Workload:**

This is a professional setting and a high level of work ethic is expected. It is the **STUDENT'S** responsibility to participate in classroom discussions and to be prepared (this is accomplished by reading, comprehending, and working problems out of the text). It is the **INSTRUCTOR'S** responsibility to identify key topics from the text and to present real world projects and experiences into the classroom. Students are responsible for attending class; completing examinations, quizzes, assignments, and projects.

### **Student Evaluation:**

Each student is solely responsible for his/her grade average. This evaluation is objective and based on multiple exams, quizzes, homework assignments and projects. There shall be no curving or bonuses in this class. All grades are based entirely on the student's performance.

## **Student Grade Scale**

A: 90%-100%	Benchmark: Professional
B: 80%-89.9%	Benchmark: Target
C: 70%-79.9%	Benchmark: Target
D: 60%-69.9%	Benchmark: Substandard
F : <60%	Benchmark: Substandard

## **Student Grade Distribution**

### **Homework/Review Questions:**

1. Assignments are due on the date scheduled and are to be submitted **at the beginning of class**. The instructor reserves the right to accept assignments that are turned in late with prior approval or with a legitimate excuse. However, the instructor may deduct one full letter grade for each day the assignment is late.
2. No work will be accepted after the due date. Missed assignments will be recorded as zeroes.
3. Each assignment will be presented in a neat and orderly fashion. Questions and answers will be **very neat/legible**. All calculations shall be worked on engineering/graph paper.
4. Quizzes/Exams will be based on the reading assignment, homework and chapter review questions. No make-up quizzes will be administered. Quizzes may be announced or unannounced.

### **Exams [20% (10% each)]**

There will be two exams. Exams will be based on the reading assignments and chapter review questions, quizzes, etc. Make-up exams will be administered only at the discretion of the instructor.

### **Homework (30%):**

Syllabus (Fall 2013)  
Instructor:

Homework will be assigned throughout the semester. The majority of the assignments will be based on AutoCad drawings. Each assignment has been developed to increase the understanding and skill in creating engineering drawings.

**Projects (30%):**

Each student will prepare a major project that encompasses a 2D illustration of a part or device. This engineering drawing must demonstrate student proficiency in using AutoCad. Each student project must contain the following items: Properly laid out illustration with title block, a 2D illustration with layers and the use of auxiliary views, and a section with dimensioning. The final project must be presented in both electronic and printed forms. All projects must be approved by the instructor.

**Comprehensive Final Exam (20%):**

The Final exam will be administered on XXX

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## APPENDIX B



**DEPARTMENT:** TECHNOLOGY  
**PROGRAM:** Technology  
**COURSE TITLE:** Engineering Graphics II  
**COURSE NUMBER:** TECH 2208

### **Course Information**

**Course description:** This course is a continuation of Engineering Graphics I. It covers advanced concepts in 3D geometry; parametric solid modeling; geometric dimensioning and tolerancing using ANSI and ISO standards; working drawings and fasteners. Emphasis is placed on a thorough understanding of 3D solid modeling to create engineering graphics in civil, electrical, and mechanical engineering technology.

**Course Pre-requisite(s):** TECH 1108, Engineering Graphics I  
**Course Co-requisite(s):** None

**Delivery Method:** The course will be delivered using traditional face-to-face lecture and will be enhanced/managed online utilizing Blackboard. Students will be required to access the course enhancement tools to obtain the course syllabus, assignments, and grades for the course.

**Lecture Information:** 3 credit hours  
**Location:** 113 Engineering Technology Building  
**Meeting day(s):** MW  
**Meeting time(s):** 7:30 – 8:20 am

**Laboratory Information:** None required for this course  
**Location:** N/A  
**Meeting day(s):** N/A  
**Meeting time(s):** N/A

### **Instructor Information**

**Instructor Name:**  
**Email:**  
**Office location:**  
**Office hours:**  
**Phone:**  
**Fax:**

### **Required Course Materials**

**Required Textbook(s):** To be determined

**Optional References:**

**Other Tools/Supplies:** N/A  
**Software:** AutoCad, SolidWorks, Inventor, or other similar solid modeling software, Word, Excel, Power Point, and internet capability

## **ETAC of ABET Program Objectives**

The ETAC of ABET Accredited Programs at FSU concur with ABET in defining program educational objectives as *“broad statements that describe the career and professional accomplishments that the program is preparing graduates to achieve during the first few years following graduation.”*

- 1. Apply the skills and methodologies to solve problems as an engineering technology professional*
- 2. Use learned technical and non-technical methodologies to communicate to audiences of varying demographics*
- 3. Perform work responsibilities independently or as part of a team, ethically and respectfully*
- 4. Assess the societal and global impact of professional decisions and practices*
- 5. Pursue lifelong learning through professional development*

## **ETAC of ABET Program Outcomes**

The ETAC of ABET accredited Programs concur with ABET in defining Program Outcomes as *“units of knowledge or skill students are expected to acquire from the program to prepare them to achieve the program educational objectives. These are typically demonstrated by the student and measured by the program at the time of graduation”.*

The Program Outcomes for the ETAC programs are comprised of six (6) established outcomes which encompass ABET’s required a-k and the program specific outcomes.

- 1. Master and apply current knowledge, techniques, skills and modern tools of their disciplines including mathematics and science*
- 2. Identify, analyze and improve technical processes including experimental verification*
- 3. Apply creativity in the design of systems, components or processes appropriate to program objectives including working on teams and communicating effectively*
- 4. Prepare for the ability to engage in lifelong learning, a commitment to quality, timeliness, and continuous improvement*
- 5. Demonstrate an awareness of professional, ethical and social responsibilities, including a respect for diversity and a knowledge of contemporary professional, societal and global issues*
- 6. Solve complex problems utilizing discipline specific expertise.*

## Course Outcomes and Assessment Key

At the conclusion of this course, students will be able to meet the following outcomes:

1. Explain the similarities and differences between 2D and 3D models
2. Manage the 3D workspace via the use of command shortcuts and customized menus
3. Use computer-aided drafting or design tools to prepare graphical representations for civil, electrical, or mechanical engineering
4. Create, modify, and use 3D wire frame, surface, and solid models
5. Demonstrate the ability to design based on an analysis of a model's properties
6. Store, retrieve, and reproduce 3D engineering models
7. Create assemblies of solid parts
8. Plan and prepare documents appropriate for mechanical design and civil construction
9. Create production models using 3D models in civil, electrical, or mechanical engineering technology

## Assessment Tools Key

Assessment Number	Assessment Tool	Benchmark*		
		Substandard	Target	Professional
1	Homework/Exams	<70%	70%-90%	≥ 90%
2	Homework/Exams	<70%	70%-90%	≥ 90%
3	Homework/Exams	<70%	70%-90%	≥ 90%
4	Homework	<70%	70%-90%	≥ 90%
5	Presentation	<70%	70%-90%	≥ 90%
6	Homework/Exams	<70%	70%-90%	≥ 90%

\* Note that the benchmark range does not indicate passing or failing. It is an indicator for continuous improvement of the course.

## Learning Objectives Key

### Institutional Assessment of Course:

The institutional assessment will be administered using the IDEA educational assessment format. It is the intent of the instructor to emphasize the following IDEA objectives during the course:

(Scale: M = Minor or no importance, I = Important, E = Essential)

No.	Assessment Category	Scale		
		M	I	E
1.	Gaining factual knowledge (terminology, classifications, methods, trends)		X	
2.	Learning fundamental principles, generalizations, or theories			X
3.	Learning to apply course material (to improve thinking, problem solving, and decisions)			X
4.	Developing specific skills, competencies, and points of view needed by professionals in the field most closely related to this course		X	
5.	Acquiring skills in working with others as a member of a team	X		
6.	Developing creative capacities (writing, inventing, designing, performing in art, music, drama, etc.)	X		
7.	Gaining a broader understanding and appreciation of intellectual/cultural activity (music, science, literature, etc.)	X		
8.	Developing skill in expressing oneself orally and in writing		X	
9.	Learning how to find and use resources for answering questions or solving problems	X		
10.	Developing a clearer understanding, and commitment to, personal values	X		
11.	Learning to analyze and critically evaluate ideas, arguments, and points of view	X		
12.	Acquiring an interest in learning more by asking questions and seeking answers		X	

## Course Outline and Tentative Schedule of Topics

### A. Syllabus review

1. **Basic Review of AutoCad**
  - a. **Communicating effectively**
    1. Title block
    2. Lettering
    3. Line types
    4. Geometric construction
    5. Basics of AutoCad program
2. **Advantages of 3D Solid Modeling**
  - a. **Demo of modeling**
    1. Generating a drawing

2. Sketching rectangles, circles, lines, arcs
  3. Assigning materials
  4. Changing graphics area background color
3. **Sketch entities and tools**
    - a. **Extrusions and revolutions**
      1. Dimensions
      2. Fillets and chamfers
4. **Counter bored holes**
    - a. **Advanced sketching techniques**
      1. Offset
      2. Patterns
      3. Mirroring
      4. Linear and circular patterns
      5. Linking dimensions
      6. Colors
5. **Copying features**
    - a. **Copying features within the same part or different part**
      1. Move, copy, rotate, scale, and stretch
      2. Equations
      3. Cut and measure
6. **Mass properties**
    - a. **Use of reference planes**
      1. Shell
      2. Moving a sketch to a different plane
      3. Interpolation
7. **Sweeps and lofts**
    - a. **Using sweeps and lofts**
      1. Composite curves
      2. Disjoint features
8. **Helix**
    - a. **3D sketching**
      1. Oblique lines
9. **Using templates**
    - a. **Templates for part and drawing files**
      1. Parts
      2. Assemblies
      3. Drawings

10. **Working with drawing views**
  - a. **Projected, auxiliary, and section views**
    1. Alignment and rotation
    2. Scaled views
    3. Shaded isometric views
    4. Cropping
    5. Hiding lines
  
11. **Stress/Strain analysis**
  - a. **Using simulations**
    1. Assemblies
    2. Editing parts in an assembly
    3. Mated parts in an assembly
  
12. **Advanced Assemblies**
  - a. **Working with advanced tools**
    1. Patterns in assemblies
    2. Exploded assemblies
    3. Mirrored parts
    4. Interference and clearance
  
13. **3D Solid modeling in civil, electrical, and mechanical engineering**
  - a. **Creating a model specific to student's program areas**
    1. Creating a final project

## ***Policies/Procedures***

Students enrolled in the Department of Technology programs at Fairmont State University will primarily be concerned with applying established scientific and engineering knowledge and methods combined with technical skills in support of engineering activities.

### **Professionalism and Classroom Etiquette:**

Students will gain the most from this course if they treat it as a work or professional experience. Being prepared in the classroom means reading *and* comprehending all assignments prior to class meetings. Maintaining and organizing class documents will prepare you for future courses and future goals after you leave this program.

- a. *No Tobacco or food is permitted in the Classroom/Laboratories.*
- b. *Closed drinking containers are permitted in the classroom.*
- c. *Observe proper Cell Phone etiquette during class*
- d. *Professionalism*
- e. *Honor code*
- f. *Attendance/tardy*
- g. *Examination policy*
- h. *Dress code (Hats will be removed during Class)*
- i. *Student work submitted for grade*
- j. *Presentations*

**Disability Services:** Services are available to any student, full or part-time, who has a need because of a [documented] disability. It is the student's responsibility to register for services with the coordinator of students with disabilities and to provide any necessary documentation to verify

a disability or the need for accommodations. The Coordinator of Disability Services, Andrea Pammer, is located in Colebank Hall 307. The office phone is (304) 367-4686. TTY 304-367-4906. Her e-mail is [apammer@fairmontstate.edu](mailto:apammer@fairmontstate.edu)

### **Additional Policy Statements from the Office of Academic Affairs:**

In keeping with the Department of Technology program's goal of professional development and conduct, the attached link further expresses the information regarding integrity, student disability services and expectations of students:

<http://www.fairmontstate.edu/AcademicAffairs/SyllabusStatements.asp>

## **Student Responsibilities**

### **Student Workload:**

This is a professional setting and a high level of work ethic is expected. It is the **STUDENT'S** responsibility to participate in classroom discussions and to be prepared (this is accomplished by reading, comprehending, and working problems out of the text). It is the **INSTRUCTOR'S** responsibility to identify key topics from the text and to present real world projects and experiences into the classroom. Students are responsible for attending class; completing examinations, quizzes, assignments, and projects.

### **Student Evaluation:**

Each student is solely responsible for his/her grade average. This evaluation is objective and based on multiple exams, quizzes, homework assignments and projects. There shall be no curving or bonuses in this class. All grades are based entirely on the student's performance.

## **Student Grade Scale**

A: 90%-100%	Benchmark: Professional
B: 80%-89.9%	Benchmark: Target
C: 70%-79.9%	Benchmark: Target
D: 60%-69.9%	Benchmark: Substandard
F : <60%	Benchmark: Substandard

## **Student Grade Distribution**

### **Homework/Review Questions:**

1. Assignments are due on the date scheduled and are to be submitted **at the beginning of class**. The instructor reserves the right to accept assignments that are turned in late with prior approval or with a legitimate excuse. However, the instructor may deduct one full letter grade for each day the assignment is late.
2. No work will be accepted after the due date. Missed assignments will be recorded as zeroes.
3. Each assignment will be presented in a neat and orderly fashion. Questions and answers will be **very neat/legible**. All calculations shall be worked on engineering/graph paper.

4. Quizzes/Exams will be based on the reading assignment, homework and chapter review questions. No make-up quizzes will be administered. Quizzes may be announced or unannounced.

### **Exams [20% (10% each)]**

There will be two exams. Exams will be based on the reading assignments and chapter review questions, quizzes, etc. Make-up exams will be administered only at the discretion of the instructor.

### **Homework (30%):**

Homework will be assigned throughout the semester. The majority of the assignments will be based on AutoCad drawings. Each assignment has been developed to increase the understanding and skill in creating engineering drawings. Homework assignments will include creating a drawing template file and library, creating a drawing from multiple components, including a drawing template file and block library, and developing a customized menu interface.

### **Projects (30%):**

Each student will prepare a major project that encompasses a 3D illustration of a part or device. This engineering drawing must demonstrate student proficiency in using AutoCad. Each student project must contain the following items: Properly laid out illustration with title block, a 3D illustration with the use of an assembly illustration using a customized menu interface and command parameters. The final project must be presented in both electronic and printed forms. All projects must be approved by the instructor.

### **Comprehensive Final Exam (20%):**

The Final exam will be administered on XXX