Engineering Technology (ETEC) 12
Introduction to Engineering Design (IED)
Course Syllabus

Instructor:	Rick Hughes	Office Hours	Room:
Phone:	(310 660-3593 Ext 3624	Mon-Wed-Thur 5:00-6:00 p.m.	TA 201
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DESCRIPTION:
This course is an introduction to engineering: the people, what they do, what engineering is all about. It is designed to show students the wide variety of fields of engineering, help the student determine which field of engineering is of most interest, and offer the opportunity to become excited about engineering.

GOALS:

1. Learn about the wide variety of fields of engineering and what engineers actually do on the job.
2. Help the student determine what field of engineering is of most interest.
3. Learn about the wide range of non-engineering careers open to those with an engineering education.
4. Learn how engineers communicate.
5. Gain an understanding of ethical professional behavior.

STUDENT LEARNING OUTCOMES:

Orthographic Drawing

Given an incomplete set of orthographic views of a simple machined part, the student shall be able to complete the given views and to construct the missing views.

Design Package

Given a simple set of design constraints, the student shall be able utilize AutoCad Inventor software to produce a design document package including two-dimensional drawings and three-dimensional models.

Design Project

Upon completion of the course, the student shall be able to take a design project from problem statement to final production drawings.

REQUIREMENTS:

Students will be required to keep a portfolio of all exercises, activities and projects. Portfolios will be assessed on a regular basis for completeness. Everyone will be expected to actively participate in classroom activities. Teamwork is an integral part of this course. Students will become involved in discussions of engineering issues in groups and individual meetings.

DISCIPLINE:

Students are responsible for their behavior and are subject to the school rules as stated in the College Catalog's Discipline and the Academic Honesty Policies.

EVALUATION:

Students will be evaluated based on the following:

- Group Participation/Cooperation/Overall Behavior
- Presentations – Oral & Written
- Portfolio
- Sketching Techniques
- Mastery of Software - AutoDesk Inventor
- Tests & Quizzes
- Conceptual and Physical Modeling

Grades will be determined from the following scale:

- 90% – 100% = A
- 80% – 89% = B
- 70% – 79% = C
- 60% – 69% = D
- < 60% = F

DISABILITY STATEMENT:

Students with disabilities who believe they may need accommodations in this class are encouraged to contact the Special Resources Center on campus as soon as possible to ensure such accommodations are implemented in a timely fashion. Please contact me privately to discuss your specific needs.

The following are topics to be covered during the course.

Please note that these topics are not necessarily addressed in the order listed below.

Unit 1: Introduction to Engineering Design

- History of Design/Evolution of Innovation
- Professional Organizations
- Career Opportunities

Unit 2: What is Design?

- Design Process
- Brainstorming
- Cooperative Designs
- Principles and Elements of Design

Unit 3: Student Portfolio Development

- Types of Portfolios
- IED Portfolio Requirements

Unit 4: Sketching and Visualization

- Sketching Techniques
- Pictorial Sketching
- Annotated Sketches

Unit 5: Geometric Relationship

- Forms & Shapes
- Geometric Constraints
- Coordinate Systems

Unit 6: Modeling

- Conceptual Modeling
- Graphical Modeling
- Physical Modeling
- Mathematical Modeling
- Computer Modeling

Unit 7: Assembly Modeling

- Adding Components
- Assembly Constraints
- Part Library
- Sub-Assemblies
- Driven Constraints
- Adaptive Design

Unit 8: Model Analysis and Verification

- Mass Properties
- Tolerancing

Unit 9: Model Documentation

- Working Drawings
- Dimensioning
- Annotation

Unit 10: Presentation

- Communication Techniques
- Presentation Methodology

Unit 11: Production

- Manufacturing Design Analysis
- Process Planning
- Design for Automated Manufacturing
- Materials, Procurement Handling and Cost Analysis
- Quality Control
- Manpower and Facility Requirements
- Packaging

Unit 12: Marketing

- Product Analysis
- Packaging Requirements

Semester Tasks/Values

WEEK	ASSIGNMENT	POINTS
1	3 Job Possibilities 3 Design Briefs	25 25
2	Sketches From Handouts 7 Orthographic 5 Isometric	25 25
3	Solid Models From Handouts (11)	50
4	Working Drawings From Solid Models(6)	50
5	Puzzle Cube Design Project	75
6	Mold Design Project	75
7-8	Toy Train Project	75
9	Midterm Examination	100
10-11	Desk Organizer Design Project	100
12	'Choose One' Design Project	100
13-14	Final Design Project	125
15	Marketing Presentation	50
16	Final Examination	100