

CASPER COLLEGE COURSE SYLLABUS

Course Number and Title: ENTK 1650-01 Mechanical Drafting/Design I

Semester/Year: Fall 2015

Lecture Hours: 2

Lab Hours: 4

Credit Hours: 4

Class Time: 9:00 – 12:00

Days: Tuesday and Thursday

Room: GW 107

Instructor's Name: Paul Brutsman

**Instructor's Contact
Information:**

Office Phone:
(307) 268-2529 w/voice mail

Email:
pbrutsman@caspercollege.edu

Office Hours: Monday and Wednesday 12:00 p.m. - 1:00 p.m. and 5:30 p.m. – 6:00 p.m.
Tuesday 12:00 p.m. 12:30 p.m. and 3:15 p.m. -3:30 p.m.
Thursday 12:00 p.m. – 12:30 p.m. and 3:15 p.m. -4:00 p.m.

Course Description: A continuation of the instruction received in ENTK 2510, this is an intermediate mechanical design course focusing on assembly modeling using both top-down and bottom-up techniques. Application of design intent on part and assembly models instructs the student to predict how design changes will impact the model. In addition, students realize the importance of file management tools in assemblies.

Statement of Prerequisites: ENTK 2510

Institutional Outcomes:

- Demonstrate effective oral and written communication
- Use the scientific method
- Solve problems using critical thinking and creativity
- Demonstrate knowledge of diverse cultures and historical perspectives
- Appreciate aesthetic and creative activities
- Use appropriate technology and information to conduct research
- Describe the value of personal, civic, and social responsibilities
- Use quantitative analytical skills to evaluate and process numerical data

Program Goals: The goal of the Drafting & Design department is for students to obtain an education and practical skill development that promotes lifelong learning and insures student success in a career in Drafting & Design or an allied field within Engineering Technology.

Course Goal: To educate the student in basic solid modeling of assemblies using SolidWorks. The student will create assemblies using both bottom-up and top-down design techniques. Fasteners, modeled parts and web based design tools will be integrated into the assemblies.

Course Objectives: Use of 3D solid modeling software in the design process

Methodology: Practical application of theoretical concepts is emphasized in the classroom and lab. Concepts discussed in lecture will be demonstrated and then applied by the students.

Evaluation Criteria:

Homework and Quizzes	60%	A= 90-100%
Tests	10%	B= 89-80%
Final Project	10%	C= 70-79%
Portfolio	20%	D= 60-69%
		F= <59%

Casper College may collect samples of student work demonstrating achievement of the above outcomes. Any personally identifying information will be removed from student work.

Required Text, Readings, and Materials: Machinery's Handbook 29th Edition,
Engineering Drawing, and Design, David A. Madsen

References: SolidWorks.com, YouTube and other web sites.

Class Policies: Last Date to Change to Audit Status or to Withdraw with a W Grade:

- Refer to Casper College Catalog.
- During lecture please do not work on class assignments. It is important that you pay attention and take notes of the lecture. The assignments will require material covered in the lecture.
- Late assignments will not receive full credit. A letter grade will be deducted for each day the assignment is late. After two class periods the assignment will not be accepted.
- Cell phone use in the classroom is reserved for emergency purposes only. Please set all phones to vibrate and excuse yourself from the classroom if use is necessary.
- No ipod or other electronic devices will used during lecture.
- Computers are to be used for classroom work only. No games, Facebook, myspace etc.
- Attendance is very important. Students missing 5 classes will be given the choice of taking an "F" for the class, withdrawing from class or changing to an audit **and** continue to participate.
- Required Supplies: Pen/pencil, USB storage drive, notebook.
- Students will be required to complete a final project by the last week of class. The project will be presented to the class at the end of the semester.
- Portfolio: PowerPoint to include images of assignments completed during the semester with brief explanation of problem solving, design intent, strategies of graphic communication and techniques used to complete the assignment. The student will receive a grade on this portfolio as described in evaluation criteria.
- Please wipe down the desk and keyboard before or after class.

Final Project

- This is a project that is chosen by the student and approved by the instructor. This project should be something of interest to the student. You should be working on the project the entire semester. Tools in the design studio are available for manufacturing of the final project if applicable. Students are encouraged to use the 3D printer, laser engraver, CNC plasma cutter, tubing bender to manufacture their final project. Some projects are beyond our abilities to manufacture and that is okay. You will present this project at the end of the semester to the class. PowerPoint is the preferred software for this presentation.

Portfolio

- This is an electronic summary of the class assignments. This is something you could show to a potential employer who is interested in knowing what types of projects you did in class. PowerPoint is the preferred software for this portfolio. Simply convert this to a .pdf file for future use

Robotics Fabrication Lab Safety Rules

- You are required to get instructors permission before any use of the shop and equipment
- Safety glasses must be worn in the Robotics Fabrication Lab shop at all times. There are dispensers located at the entrance door. Be sure to return glasses after use.
- Safety shield must be worn when grinding. No exceptions.
- If you are welding, safety curtains must be positioned properly
- All general shop safety rules must be followed. If you are unsure, please ask the instructor for guidance

Design Studio Safety Rules

- You are required to get instructors permission before any use of the shop and equipment
- Safety glasses must be worn in the Design Studio if any equipment is running. Be sure to return glasses after use
- All general shop safety rules must be followed. If you are unsure, please ask the instructor for guidance

Student Rights and Responsibilities: Please refer to the Casper College Student Conduct and Judicial Code for information concerning your rights and responsibilities as a Casper College Student.

Chain of Command: If you have any problems with this class, you should first contact the instructor to attempt to solve the problem. If you are not satisfied with the solution offered by the instructor, you should then take the matter through the appropriate chain of command starting with the Department Head/Program Director, the Dean, and lastly the Vice President for Academic Affairs.

Academic Dishonesty: (Cheating & Plagiarism) Casper College demands intellectual honesty. Proven plagiarism or any form of dishonesty associated with the academic process can result in the offender failing the course in which the offense was committed or expulsion from school. See the Casper College Student Code of Conduct for more information on this topic.

Official Means of Communication: Casper College faculty and staff will employ the student's assigned Casper College email account as a primary method of communication. Students are responsible to check their account regularly. This is also, where you will find course evaluation links during course evaluation periods.

ADA Accommodations Policy: If you need academic accommodations because of a disability, please inform me as soon as possible. See me privately after class, or during my office hours. To request academic accommodations, students must first consult with the college's Disability Services Counselor located in the Gateway Building, Room 344, (307) 268-2557, bheuer@caspercollege.edu. The Disability Services Counselor is responsible for reviewing documentation provided by students requesting accommodations, determining eligibility for accommodations, and helping students request and use appropriate accommodations.

Course Outline

Week 1

- SolidWorks user interface (UI)
 - Menu Bar
 - Drop Down Menus
 - Right Click Menus
 - Flyout toolbar buttons
 - System feedback icons
 - Confirmation corner
 - Heads-up view toolbar
 - CommandManager
 - FeatureManager design tree
 - Flyout FeatureManager
 - Task Pane
 - Design Library
 - File Explorer
 - Search
 - View Palette
 - RealView
 - Document Recovery
 - Motion Study
- SolidWorks Tutorials
- Bolt, Nut and washer assembly exercise

Week 2

- Fasteners and Hole Types
 - Type
 - Length
 - Pitch
 - Standards
 - Machinery's Handbook
- SW Toolbox
- Measuring Tools
 - Calipers
 - Screw pitch gage
- Machinery's Handbook
 - Clearance and tap sizes
 - Socket Head Cap screw counterbore size
- Hole Wizard
 - Hole types
 - Clearance and tap sizes

FASTENER AND HOLE ASSIGNMENT

Week 3

- BOM
- Toolbox Configuration – Part number and material

Week 4

Designing in the context of an assembly
Top down
Bottom up
BOM – Auto filling cells in BOM
BLOCK ASSIGNMENT

Week 5 and 6

SW Explorer
Keyways
Snap Rings
Dimensioning Shafts and Keyways
Keyways and Snap Rings Toolbox

SHAFT WITH KEYWAY ASSIGNMENT

Week 7

Dimensioning
Design Tables
Surface Finish
Heat Treating
Hardness Testing
Hole Wizard – custom hole option for specific dimensions

PRECISION PARALLEL ASSIGNMENT

Week 8 and 9

Bearings and Bushings
Fit Classifications
SW Toolbox

BEARING ASSIGNMENT

Week 10

Photoview 360

Week 11 – Midterm test

Week 12 and 13

Machine shop screw jack- model and manufacturing prints

SCREW JACK ASSIGNMENT

Week 14

Reverse engineer casting
Metric Threads
Radius gages

CASTING ASSIGNMENT

EDRAWINGS – 3D .pdf

Week 15

Independent Project

Week 16

Independent Project

SCHEDULE SUBJECT TO CHANGE