Western Michigan University
College of Engineering and Applied Sciences
Engineering Design, Manufacturing, and Management Systems (EDMMS)

EDMM 4460: Advanced Computer Aided Design

- Catalog Description: Parametric development and applications customization on selected commercial Computer-Aided Design (CAD) systems. Investigation of existing graphics packages and advanced software design with special emphasis on surface and solid modeling for design creation, display, and analysis. Lecture/Lab (2 & 3 hrs.); Credit: 3 hrs.

- Prerequisites by Courses:
  EDMM 2460: Computer-Aided Design

- Prerequisites by Topic:
  1. Understanding of Solid Modeling Techniques (EDMM 2460)
  2. Ability to utilize feature-based CAD software (EDMM 2460)
  3. Capability to apply parametric solid modeling with CAD software (EDMM 2460)
  4. Knowledge of standard specifications and components for CAD systems (EDMM 2460)
  5. Awareness of trends and developments in the CAD/CAE field (EDMM 2460)

- Textbooks:
  1. Creo Parametric 3.0 Tutorial and Multimedia CD, by R. Toogood and J. Zecher, Schroff Development Corporation, Mission, 2015.

  2. Creo Parametric 3.0 Advanced Tutorial, by R. Toogood, Schroff Development Corporation, Mission, KS, 2015.

- Reference:
  On-line Help for Pro/E (and other software).

  Creo Parametric 3.0, by L. G. Lamit, Cengage Learning, Stamford, CT, 2015.

- Course Instructor/Lab Instructor:
  - Course: Jorge Rodriguez, PhD, MBA, Parkview Campus E-224, (269) 276-3374, jorge.rodriguez @wmich.edu.

- Objectives/Performance Criteria:

Based on the above stated course description, at the conclusion of the semester the student should be able to:

Course Objectives	Performance Criteria[1]
1. Perform basic and advanced solid modeling with feature-based CAD software packages	(A1) Efficiently model a variety of components/systems utilizing advanced options in CAD software used in classroom
2. Utilize principles behind constraint-based CAD software packages	(D2) Properly specify constraints that reflect functionality of modeled components/systems in CAD
3. Apply concepts underlining parametric solid modeling for proper capture of Design Intent	Perform design changes to parametric CAD models, conserving their functionality
4. Understand basic customization options	Perform standard customization of Cad package depending of its application
5. Recognize and use important sources of information for trends, evaluations and opinions of CAD hardware and software	Research and report on latest developments and their impact on CAD usage

The course has two components: lectures and lab. All meeting times are in the lab, with appropriate explanations and demos given as needed. In these lab times we will focus on learning, applying and customizing commercial CAD software(s) popular in industry nowadays. We will spend the entire semester on Creo (previously known as Pro/E). There might be some demos of other software, depending on their availability for classroom use. The "learning" part is based on tutorial and reading/questions (i.e., textbooks); the "applying" part will be carried out with exercises, homework exercises, and projects (from textbook); the "customization" part will consist of your own project. This course is lab-intensive. I want you to really get involved in learning about solid modeling with Creo, and showcase it in your final project.

- Topics (tentative):
    - Demo on material covered in each chapter.

    Labs: Creo
    - Intro/System/Environment (1 week)   *
    - Basic Modeling and Sketcher (2 weeks)   *
    - Sweeps and Blends (2 weeks)   *
    - Assembly (1 week)   *

- ◆ Customize Environment (1 week)   *
- ◆ Advanced Sweeps/Rounds (1 week)   *
- ◆ Pro/Tables, UDF (1 week)   *
- ◆ Pro/Program (1 week)   *
- ◆ Advanced Drawing/Assembly (2 weeks)   *

- **Evaluation:**
    - 1. Lecture (15%):
        - a) Partial Exams   50 pts
        - b) Quizzes   50 pts
        - c) Homework   50 pts
        - d) Report/Paper/Evaluations   100 pts
    - 2. Lab (85%):
        - a) Tutorials   150 pts
        - b) Exercises   250 pts
        - c) Final Assemblies   150 pts
        - d) Project   75 pts
        - e) Exams   50 pts

- **Computer Usage:**
    Extensive use of computer hardware and software is required in this course.

- **Laboratory Project:**
    An individual Final Project, consisting of a system assembly where the majority of the topics covered are being utilized, is required at the end of the semester sessions. Proper documentation is required in the form of a final report.

- **Oral and Written Communications:**
    The Evaluation Reports are a two-page-minimum submission providing your own evaluation of each one of the CAD software textbooks used during the semester. The format for the report is specified in the schedule of assignments.
    No handwritten submissions are accepted.

- **Calculus Usage:**
    No use of calculus is expected in this course.

- **Library Usage:**
    Use of the library is expected to obtain proper references for all written reports.

- **Comments:**
    - ➢ All assignments are due either at the start or at the end of the session, according to schedule given for each set of tutorials. A schedule of lab assignments will be distributed/posted.
        - ➢ Reading assignments and quizzes will be given during the semester.

- ➢ Pre- and post-chapter quizzes will be given during the semester. Lecture/lab quizzes are written ones. Lecture/lab quizzes could be previously announced or not.
- ➢ Lab quizzes/exams are written and/or hands-on.
- ➢ Written evaluations are due after each textbook is covered. The software-textbook evaluations are your opinion (provide likes and dislikes) on the topics covered, and the way they were presented.
- ➢ Electronic submission (eLearning) of all lecture and lab work will be required.
- ➢ You must create proper directories and name your files in a sequential fashion according to the instruction that will be given during class/lab. The set of folder that need to be created in your account is as follows: edmm4460> chapter1 to chapter11, chapterA1 to chapterA8; project1, project2, final project, quizzes; papers; and readings.
- ➢ E-mail and eLearning will be used for communication during the semester.
- ➢ All work should be done individually.
- ➢ You are required to attend all the sessions.
- ➢ Strict control of the due dates will be kept. Penalty applies to any late submission of work. The penalties are: 20% for submission during the same session, additional 20% for submission the same day, then 20% each subsequent day.
- ➢ Some grading will take place during the sessions. No work will be accepted after the assignment has been graded.
- ➢ Make up exams and lab quizzes will be allowed only for verified extreme circumstances.
- ➢ Use of personal computer/laptops/device is permitted during lectures/lab only for class-related activities. No use of any other personal electronic devices is allowed during lecture/lab.
- ➢ Student must comply with the Academic Honesty Policy in WMU's Student Code.

Grades: Based on average and standard deviation for the group. A good estimate of your grade at any time during the semester is that an average score represents a high CB grade or breaking point CB-B, with each standard deviation representing one full letter grade.

Note: These are basic guidelines. If you have any questions or doubts about something related to how the course will be conducted, please ask about it. I will be more than willing to explain or clarify your doubts. Do not assume or expect anything.

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