

**DFT 8 - Engineering Graphics II****Catalog Description****Transfer Status:** CSU**Prerequisite:** DFT 2**Unit(s):** 3.00**Lecture:** 34.00 Contact hours/68.00 Out of class hours/102.00 Total hours/2.00 Unit(s)**Lab:** 51.00 Contact hours/0.00 Out of class hours/51.00 Total hours/1.00 Unit(s)**Total:** 85.00 Contact hours/68.00 Out of class hours/153.00 Total hours/3.00 Unit(s)

Course Description: In this computer-based graphics course, students who have already completed the learning objectives of DFT-2: Engineering Graphics I, will be introduced to more advanced uses of the solid modeling application, SolidWorks. These uses include Simulation of parts using Finite Element Analysis (FEA) methodology, Sheet Metal, Weldments, and the concepts of Additive Manufacturing (3D Printing). Students will model parts and will test them using simulation and engineering analysis. Topics within simulation include static, frequency, thermal, vibration and drop test analysis methods. The use of simulation to generate engineering reports will be introduced and reports will be generated. Sheet Metal and Weldments with demonstrations and assignments will incorporate the use within industries such as: Manufacturing, Engineering, Drafting, and Production Assembly.

Objectives

Upon successful completion of this course, the student should be able to:

1. Describe the role of engineering analysis in the engineering design process.
2. Explain and demonstrate the use of finite element analysis (FEA) to perform engineering analyses.
3. Set up the solid modeling application to perform engineering analysis using simulation modules.
4. Analyze parts with static, frequency, thermal, vibration and drop test methods using the solid modeling application
5. Analyze assemblies with static, frequency, thermal, vibration and drop test methods using the solid modeling application.
6. Produce engineering reports formatted in standard forms and generally accepted engineering methods using the solid modeling application.
7. Apply relevant areas of engineering analysis to document attributes of parts, assemblies and associated drawings used in design engineering processes.
8. Utilize sheet metal and weldments for design as used in various industries.

Course Content**Topic Titles / Suggested Time Topic****Lecture**

<u>Topics</u>	<u>Lec Hrs</u>
Course Introduction and Assessments	2.00
Introduction to Engineering Analysis and Finite Element Analysis (FEA)	3.00
Static Analysis Methods and Applications	3.00
Static and Frequency Analysis Methods and Applications	2.00
Frequency Analysis Methods and Applications	3.00
Contact, Static and Thermal Stress Analysis Methods and Applications	5.00
Product Data Management (PDM) Methods and Applications	5.00
Geometric Dimensioning and Tolerancing (GD&T) and Graphic Standards Application and Methods	2.00
Manufacturability and Sustainability	3.00
Model Development and Simulated Engineering Analysis	3.00
Animation Methods and Applications	3.00
Total Hours:	34.00

Lab

<u>Topics</u>	<u>Lab Hrs</u>
Introduction to Engineering Analysis and Finite Element Analysis (FEA)	4.00
Animation Methods and Applications	7.00
Static Analysis Methods and Applications	5.00
Static and Frequency Analysis Methods and Applications	7.00
Frequency Analysis Methods and Applications	6.00

Topics	Lab Hrs
Product Data Management (PDM) Methods and Applications	6.00
Geometric Dimensioning and Tolerancing (GD&T) Application and Methods	4.00
Manufacturability and Sustainability	4.00
Model Development and Simulated Engineering Analysis	8.00
Total Hours:	51.00

Methods of Instruction

- A. Class Activities
- B. Collaborative Group Work
- C. Demonstrations
- D. Homework: Students are required to complete two hours of outside-of-class homework for each hour of lecture
- E. Lecture
- F. Multimedia Presentations

Methods of Evaluation

- A. Exams/Tests
- B. Quizzes
- C. Projects
- D. Homework
- E. Class participation

Examples of Assignments

Reading Assignments

1. Read the Introduction to Engineering Analysis. Be prepared to discuss in our next scheduled class session.
2. Read the article from Machine Design magazine (September 2011) titled "Engineering Analysis with Solids Modeling Application". Be ready to discuss in our next scheduled class session.

Writing Assignments

1. After reading the attached document called "Product Data Management (PDM) Applications", summarize in your own words (minimum 500 words) the scope of application of PDM to engineering graphics and engineering.
2. After reading about the applications of thermal simulation, complete the questions in the study guide and submit to the instructor.

Out-of-Class Assignments

1. Search for the exact phrase "Solidworks Simulation with fixed points" online. Find and watch the video entitled: "Analyzing a Frame in Solidworks Simulation". Answer the following question: "How does Solidworks manage the beam elements to create a fixed point?" Submit written answers (500 word minimum) to instructor.
2. List the frequency analysis setup tasks introduced in today's lecture and be prepared to review your results in groups in the next class session.

Recommended Materials of Instruction

Kurowski, P. (2025). Engineering Analysis with Solid Works Simulation. *SDC Publications, 2025*. 9781630577025.
SolidWorks. *Dassault Systems, Current Academic Year*.

Minimum Qualifications

Drafting
Engineering (Masters Required)

Created/Revised by: Manning, Phillip

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