

ME 421 Advanced Computer Aided Design

Catalog Description:

Use of solid modeling software (CATIA) for advanced component design, creation of complex multi-component assemblies, animation studies, and rendering. Course concludes with a month-long final project.

Course Prerequisites: ME 301 or instructor permission

Class Meeting Times:

Group A (A-L) Class Periods – Tuesday 2:00-3:15 GJ 115
Group B (M-Z) Class Periods – Thursday 2:00-3:15 GJ 115

Hybrid In-Class vs. Zoom Groups

Group A: last name starting A-L
Group B: last name starting M-Z

Instructional Team:

Joel Perry (Faculty Supervisor) jperry@uidaho.edu EP 324D
Nick Brubaker (TA Instructor) brub8655@vandals.uidaho.edu GJ 109

Office hours:

Nick Brubaker ZOOM (link on bbLearn) Monday-Friday from 10am to 11pm

Course Website: <http://www.webpages.uidaho.edu/mindworks/CATIA.htm>

Course File Management:

Onedrive---Shared Libraries---Storage-Engineering---SeniorDesign---Catia Course---31 Spring 2021

This is where you will keep your CATIA models and coursework.

Course Learning Outcomes:

- 1) Gain familiarity with the following CATIA workbenches: part design, assembly design, generative surface design, sheet metal design, generative drafting, digital mock-up (DMU), and photo studio
- 2) Navigate CATIA's on-line help system to learn about new workbenches, cultivating transferable software learning skills.
- 3) Use 'save management' to successfully copy, update, and organize solid modeling documents.
- 4) Employ relational features, such as functions and parameters, in part design and assembly modeling for easier product development, maintenance, and reuse.
- 5) Create 2D drawing documents and 3D model based definitions as guides for manufacturing.
- 6) Create a catalog of parts based on a design table, facilitating part family design.
- 7) Implement environments, materials, light sources, and camera techniques for impactful visualization of design products.
- 8) Based on introductory experience with generative surface design, use simple surfaces as the starting point for solid model construction.

- 9) Create accurate Finite Element models and test the analysis software's capabilities.
- 10) Advance organization knowledge about design realization, design analysis, design visualization, or design for manufacturing by creating/updating electronic learning objects (videos, quick references, tutorials, and exemplar designs) for future use by yourself and other students.

Course Activities:

This course introduces you to concepts and tools for producing solid models and engineering drawing packages using CATIA. The knowledge, skills, and perspectives you develop will greatly enhance your senior design experience and will be highly marketable in the engineering workplace, including summer internships. The first sessions of the course will help you transition from Solidworks to CATIA. The following sessions examine special features of CATIA that are useful in the modern manufacturing workplace. There are no hourly exams in this class, and hence problem sets and projects will constitute the majority of your grade. Class preparation is important for getting the most out of your lab time. As such, a portion of your grade is based on quizzes that review contents of a set of student-authored instructional videos that have been specially created for this course. Nearly all assignments are individual, but there will be a team-based, major synthesis project at the end of the course. Outcomes of synthesis projects along with ongoing senior design projects will be shown publicly at the December Design Snapshot. By organizing your course work throughout the term in the 'Catia Course' folder on OneDrive, you will develop an electronic resource that can be a valuable reference in future design activities as well as in job interviews.

Hybrid Course Approach:

This course will be both in person and online. The class will be split into 2 groups half of the class will be on Tuesday and the other half will be on Thursday, with the whole class moving to an all online format for the final project. Determination of Tuesday or Thursday attendance is made alphabetically based on last name.

Group A: students with last names A-E

Group B: students with last names F-Z

Hybrid Meetings

	Tuesday	Thursday
Group A	In-person	via Zoom
Group B	via Zoom	In-person

October 19-November 2: Online/Hybrid team/instructor meetings will take place during 10-15 minute intervals with each team. Final project assignments and meeting timeslots TBD by October 16.

November 30-December 11: The University of Idaho will switch to all online course delivery after the Fall Recess and for the remainder of the semester. We will continue holding team/instructor meetings via Zoom.

Course Grading:

40% Assignments

- *Homework Exercises*

15% Quizzes

- *There will typically be a quiz before and in each class period*

45% Final Project

- *Snapshot Day Powerpoint Display*
- *Project-Specific Deliverables (stored electronically)*
- *Lessons Learned/Course Assessment*

Rubric for Scoring Quizzes/Assignments/Project Elements:

Score	Attributes
4	Exemplary, insightful, worthy of sharing with entire class
3	Complete, correct, long-term reference value to self
2	Complete, minor errors, limited reference value to self
1	Incomplete, major errors, no supporting documentation
0	Submitted late, must complete

Grade of ‘A’ corresponds to average on semester work above 3.20

Grade of ‘B’ corresponds to average on semester work between 2.6 and 3.19

Grade of ‘C’ corresponds to average on semester work between 2.0 and 2.59

Grade of ‘F’ corresponds to average on semester work less than 2.0

Healthy Vandals Policies:

It is a longstanding tradition that Vandals take care of Vandals, and we all do our best to look out for the Vandal Family. These simple precautions go a long way in reducing the impact of coronavirus on our campuses and in our communities. With everyone engaging in these small actions, we can continue to participate in our vibrant campus culture where we are able to learn, live, and grow. Please bookmark the [University of Idaho Covid-19 webpage](#) and visit it often for the most up-to-date information about the U of I’s response to Covid-19.

1. **Daily Symptom Monitoring and In-Person Class Attendance.** Evaluate your own health status before attending in-person classes and **refrain from attending class in-person if you are ill, if you are experiencing any of the [known symptoms of coronavirus](#), or if you have tested positive for COVID-19 or have been potentially exposed to someone with COVID-19.**
 - If you display symptoms and/or test positive, you should quarantine following the [CDC’s recommendations](#). Do not return to class until you meet the [CDC’s requirements](#).
 - If you have been exposed but are asymptomatic, you should stay home for 14 days from last exposure if you remain asymptomatic, adhering to the [CDC’s requirements](#).

If you miss an in-person class session, you may be able to attend via Zoom and access course materials on BbLearn. Documentation (a doctor’s note) for medical excuses is not required; instead, email me to make arrangements to submit any missed work and make plans to use Zoom and/or online course materials to stay current with the course schedule.

2. **Face Coverings.** All faculty, staff, students and visitors across all U of I locations must use face coverings whenever in any U of I buildings. **You are required to wear a face covering over your nose and mouth in this classroom at all times.**

- a. If you have a medical condition that you believe affects your ability to comply with the face covering policy, please contact [the Center for Disability Access and Resources \(CDAR\)](#) to request a reasonable accommodation.
- b. If you have other reasons you believe make you exempt from wearing face coverings, please contact the Covid-19 Coordinator at covid19questions@uidaho.edu.
- c. Failure to wear a face covering means you will be required to leave the classroom. If a disruption to the learning experience occurs due to repeated offence and/or egregious behavior, it will be referred to the Dean of Students Office for potential code violation.