

Senior Design Curriculum Map

Semester 1

TOPIC	Duration
<p>Unit 1 – Project/problem Definition: Clarify Objectives Start to plan and define your project and learn to use your engineering notebook to keep track of the ideas you collect. Concurrent Skills Launch (CSL): Sketching in Fusion-360, CAD (Computer Aided Design) review</p>	2 wks
<p>Unit 2 – Project/problem Definition: Research Solidify your idea through research, define metrics for objectives, and identify constraints. Revise your original project definition. CSL: Modeling with Fusion-360, CAD review</p>	2 wks
<p>Unit 3 – Conceptual design: Initial Design. Establish functions and requirements (specifications) for your project/problem. Establish design alternatives by finding (different) means for functions. Refine and apply metrics. CSL: 3D printing, CAD, the engineering cycle. Mini project: Design keychain with at least three linkages for in situ 3D printing. 3D print design on Lulzbot printers</p>	4 wks
<p>Unit 4 – Presentation: Conceptual Design Present your problem/project with at least two design alternatives CSL: Computer Aided Machining (CAM), the engineering cycle. Mini project: Design a wooden holder for our lathe and mill tools.</p>	1 wks
<p>Unit 5 – The design cycle (1): Design Using the feedback from the presentation, choose, revise, and improve your conceptual design. Set specifications</p>	2 wks
<p>Unit 6 – The design cycle (1), CAD Model your design in Fusion 360 and analyze your design. Create drawings and a Bill Of Materials (BOM). Write a short engineering proposal with a CAD model, BOM, budget, work distribution (for teams), specifications and timeline.</p>	3 wks
<p>Unit 7 – Presentation Give a 5-minute PowerPoint presentation of the engineering proposal. Submit a printed form of the engineering proposal. Submit a materials list in electronic form to start the procurement of materials (preferably from Amazon or Lowe's)</p>	1 wks
<p>Semester 1 Finals week</p>	1 wks

Senior Design Curriculum Map

Semester 2

TOPIC	Duration
Unit 8 – The design cycle (1) – Build Prototype Build your prototype.	7 wks
Unit 9 – The design cycle (1) – Test Test your design (test all requirements), record the data and compare the results to the specifications.	2 wks
Unit 10 – The design cycle (1) – Design Review Demonstrate your design and present the test results in a five-minute presentation to the class. <i>At this point a decision has to be made about redesign based on the test results, does the design meet specifications? With the design triangle in mind (a triangle with the labels money, time and specifications in the corners), decide what changes to make to the design. Keep in mind you cannot have it all, time and money are definitely limited so lowering the specifications might be your only (but not preferable) option.</i>	1 wks
Spring Break	
Unit 11– The design cycle (2) – Redesign. Using the test results and feedback from the presentation, redesign your product.	2 wks
Unit 12– The design cycle (2) – ReBuild Test the new design (test all requirements), record the data and compare the results to the (original or new) specifications.	3 wks
Unit 13 – The design cycle (2), – ReTest Write a test plan, get sign-off and collect data for your engineering report.	1 wks
Unit 14– Presentation and Report Write an engineering report and do a five-minute show/tell of your final product to the class. Upload all relevant files to the classes drive, turn in your engineering notebook and clean up any messes made.	2 wks
Semester 2 Finals week	