Fairfax Collegiate

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Inventing and 3D Printing 7-9 Syllabus

Course Goals

1 Learn Design Process
Students learn how visualize their ideas and make them a reality using Tinkercad, 123D Design, and 3D printing software.

2 Replicate Designs
Students replicate predetermined designs to familiarize themselves with software. Then, they use their creativity to modify and improve upon these designs.

3 Invent New Things
Students create prototypes of their own and bring them into the world through 3D printing.

4 Modify Inventions
Students test and modify their designs to optimize them for a given problem. Students decide how best to optimize their designs.

Course Topics

1 Why 3D Printing?
Students learn what makes 3D printing special and when to use 3D printing vs alternative options.

2 Printing Process
Students familiarize themselves with the 3D printing process and how it works.

3 Design Process
Students learn how to visualize and plan projects before getting started since jumping straight into a project can lead to lots of wasted time and effort.

4 Learn the Software
Students spend the first week familiarizing themselves with different types of 3D printing and design software and combining them to accomplish tasks.

5 Design Challenges
Students solve design challenges using their newly acquired knowledge in 3D design and 3D printing software.

6 Iteration
Students revisit and redesign new solutions to previously discussed problems.

7 Invention
Students design and print their own invention to take home.

8 3D Scanning
Students use Makerbot Digitizer to scan an object into a 3D design software. Students clean up the scanned file with Autodesk Meshmixer.

Course Schedule

Day 1

Introductory Topics
Students learn class rules and objectives, and discuss why this course is relevant.

Pros and Cons of 3D Printing
Students discuss the pros and cons of 3D printing and when it should be used.

3D Printing Background and Applications
Students learn about how 3D printing works and general background about the technology. Students are also introduced to the design challenges they will work on throughout the course.

Exercises with MakerBot Print
Students use exercises with MakerBot Print to familiarize themselves with the program and its ability to export files to the 3D printer.

Thingiverse Diorama
Students import files from Thingiverse and make a diorama-esque scene, with an emphasis on creativity in design.

Day 2

Tinkercad Lessons
Students use lessons on Tinkercad to familiarize themselves with 3D design.

Day 3

Tinkercad Lessons
Students use lessons on Tinkercad to familiarize themselves with 3D design.

Rocket Ship Design
Students design and print their own Rocket Ship.

Day 4

Tinkercad Projects
Students work on Tinkercad Projects. These are more advanced than the Tinkercad Lessons.

Chess Piece/Board
Students design and print a chess set.

Day 5

Tinkercad Projects
Students work on Tinkercad Projects. These are more advanced than the Tinkercad Lessons.

Creating Inventions
Students gain free reign to create whatever invention they please. No constraints, no suggestions, it's up to them what to make.

Day 6

Scan and Modify Objects
Students scan an object using the Digitizer, putting it into digital form to make some adjustments.

Day 7

Bridge Building Competition

Students design, print, and test their own bridges.

Day 8

Design Challenge
Students work in groups to design, print, test, and iterate a solution to their design challenged picked out on the 1st day.

Day 9

Problem Solving with 3D Printing
Students brainstorm and design solutions to household problems using 3D Design and 3D Printing.

Creating Inventions
Students gain free reign to create whatever invention they please. No constraints, no suggestions, it's up to them what to make.

Day 10

Creating Inventions
Students gain free reign to create whatever invention they please. No constraints, no suggestions, it's up to them what to make.

Film
Students watch a documentary about 3D printing while final projects print.

Updated on 3/20/2019