Introduction to Modeling for 3D Printing

CAD 190

Instructor: Alex Sanchez (ph 925-8716)

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Office Hours:

Mon/Wed 1:00 - 1:30 and 3:45-4:30

Tues/Thur 12:00-1:30

COURSE DESCRIPTION: The purpose of the course is to introduce students to 3D-printing software. Students will learn how to make 3D models using Sketchup and AutoCad. The 3D models will be converted to build files and printed using the lab 3D printers. You should schedule at least two hours per week (outside of class time) in the lab to complete assignments.

TEXT: the following references are recommended but not required:

3D Printing with Sketchup *Marcus Ritland*

3D Printing 2nd Edition *Christopher Barnatt*

Functional Design for 3D Printing 2nd edition *Clifford Smyth*

ATTENDANCE: Students are responsible for any missed classes. Unexcused absences will lower your grade 1% per unexcused absence (to a maximum of 10%).

GRADING: Students are graded on the basis of tests and 3D modeling assignments.

Modeling/printing assignments 60%

Mid-term and Final 40%

Students cannot use electronic equipment during quizzes and tests.

Letter grades		
	100% or higher	= A+
	91%-99%	= A
	81%-90%	= B
	71%-80%	= C
	61%-70%	= D
	Below 60%	= F

LIBRARY USE: A list of books and periodicals will be provided during the first week of class.

MAIN COURSE OBJECTIVES:

1. Introduce students to 3D modeling and 3D printing software

2. Learn how to create, edit and print 3D models

3. Learn efficient, organized approaches to 3D modeling and editing.

REQUIRED MATERIALS: You will need a ring binder and storage media for your files (flash memory devices).

Students with disabilities should notify me of special needs at the beginning of the semester.

Computer Lab Responsibility:

Please be advised that use of computer labs on UNM properties is governed by

"Policy 2500: Acceptable Computer Use" which can be found at

http://policy.unm.edu/university-policies/2000/2500.html.

Food and drink are also prohibited in any computer lab on campus. Anyone violating

these policies is subject to possible suspension and loss of computer lab privileges.

Introduction to Modeling for 3D Printing

Course schedule

Week 1

3D printing overview, history and leading applications

Introduction to Sketchup for 3D printing

Week 2

3D printing technology categories and online sources for 3D models

Using existing models

Basic navigation and modeling using Sketchup

Week 3

FDM printers and printer software

Printing process using the FFF/FDM printers

Sketchup modeling and exporting STL files

Week 4

Using 3D scanners and scanned data

Sketchup plugins for 3D printing

Week 5

Online 3D printing services

Introduction to 3D modeling using Autocad

Basic solid modeling commands and procedures

Week 6

Editing Autocad models and exporting STL files

Week 7

Validating and repairing STL files using Netfabb, Meshlab and Meshmixer

Mid-term review

Week 8

Introduction to Simplify 3D slicer software

Slicer key settings

Mid-term

Week 9

Designing functional 3D printed parts

Printing calibration models

Week 10

Introduction to 3D modeling in AutoCAD

Solid modeling using AutoCAD

Week 11

Solid modeling in AutoCAD

Surface modeling using AutoCAD

Week 12

3D printing and sustainable design

Solid model editing

Week 13

Modeling interlocking parts using AutoCAD

Week 14

Modeling gears and other moving parts

Week 15

Modeling functional parts

Final Review

Week 16

3D printing tips and traps, Final exam