Introduction to Modeling for 3D Printing

CAD 171

Instructor: Alex Sanchez (ph 925-8716)

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Office Hours:

TUES 12:30-1:00

COURSE DESCRIPTION: The purpose of the course is to introduce students to 3D-printing software. You will learn how to make 3D models using Sketchup, AutoCad, Fusion 360 and Sculptris. The 3D models will be converted to build files using slicing software 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 *2014 Marcus Ritland ISBN 1783284579*

3D Printing 3rd Edition 2016 *Christopher Barnatt ISBN 1539655466*

Functional Design for 3D Printing 3rd edition 2017 *Clifford Smyth ISBN 0692883215*

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). You will also need a UNM ID card, which you can get from the library.

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.

UNM Net ID

Beginning Fall 2015 semester, all UNM-Valencia students will be required to have a UNM Net ID which can be created by going to: ***http://it.unm.edu/accounts/****. UNM Net ID will give you access to the computer labs on campus, blackboard learn and UNM Email. Make sure to update this information as your method of contact under personal information on Lobo Web.*

Academic Integrity

Having academic integrity is paramount to your success in any class. Plagiarism or cheating is not tolerated. Any instance of this will result in a grade of zero for that assignment. Here is the link to the UNM Academic Dishonesty Policy:

https://policy.unm.edu/regents-policies/section-4/4-8.html. The policy states:

Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of academic dishonesty or who otherwise fails to meet the expected standards. Any student judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course.

Academic Dishonesty is defined as:

"Academic dishonesty" includes, but is not limited to, dishonesty in quizzes, tests, or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records.

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

If you have a documented disability, the Equal Access Services office will provide me with a letter outlining your accommodations. I will then discuss the accommodations with you to

determine the best learning environment. If you feel that you need accommodations, but have not documented your disability, please contact Jeanne Lujan, the coordinator for Equal Access Services at 925-8910 or jmlujan@unm.edu.

Introduction to Modeling for 3D Printing

Course schedule

Week 1

3D printing overview, history and leading applications

Introduction to Sketchup modeling

Week 2

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

Using existing models

Basic navigation and modeling using Sketchup

Week 3

FFF/FDM printers and printer software

Printing process using the FFF/FDM printers

Sketchup modeling and exporting STL files

Week 4

Sketchup assembly modeling

Architectural models

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 Simplify3D 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 with Fusion 360

Modeling functional parts

Week 14

Modeling gears and other moving parts

Week 15

Modeling with Sculptris

Final Review

Week 16

3D printing tips and traps, Final exam