Course Syllabus

Course Information

Course Number/Section	ATEC 4374.001 ATC 3.910
Course Title	Topics in Digital Design *DIGITAL FABRICATION*
Term	Spring 2015
Days & Times	Mon : 10:00am-12:45pm

Professor Contact Information

Professor	Andrew F. Scott
Office Phone	7501
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Office Location	ATC 1.913
Office Hours	By appointment only

Course Pre-requisites, Co-requisites, and/or Other Restrictions

ATEC 3317: Modeling and Texturing I
ATEC 2382: Computer Imaging
Department consent required

Course Description

Fundamental digital design methods that lay a foundation for more specific design-oriented areas of interest. Topics may include research and planning, drawing and composition, color/graphics and presentation, prototyping and testing. May be repeated for credit as topics vary (9 semester credit hours maximum). Department consent required. (0-3) Y.

This course explores the relationship between digital fabrication tools and contemporary artistic practice. Lectures and hands-on activities are supplemented by 2-D vector based programs, digital photography software and 3-D modeling programs. Students learn how to use the computer as both a design tool and as a tool for fabrication.

Student Learning Objectives/Outcomes

The following course goals articulate the general objectives and purpose of this course:

- Students will gain a historic, theoretic and practical understanding of digital technologies and their implications for contemporary artistic practice.
- Students will gain an understanding of the relationship between digital fabrication tools and computer software programs designed for developing three-dimensional forms, spaces and objects.
- Students will learn to use digital technologies to prepare schematic drawings, flat patterns for fabrication and to pre-visualize forms.

Required Textbooks and Materials

Required Texts

1. Blackboard Course Website
2. SCPT 250/450 Course Blogsite: http://digitalsculpture250.blogspot.com/

3. ATEC Digital Fabrication Course Blogsite: To be announced
4. Maya Online Manual
5. Rhino Online Manual
6. NextEngine/Rapidworks Online Manual
7. Keyshot Online Manual

Required Materials
3D Printing Project
Plastic & Support Materials $150.00

Laser Cutting
Wood, Acrylic,Plexi-Glass, Paper, Cardboard $50.00

Sculptural Finishing Materials
Moldmaking Casting Materials $100.00

Suggested Course Materials
Suggested Readings/Texts
1. Lisa Iwamoto. Digital Fabrication. Architectural and Material Techniques.Princeton Architectural Press, New York. ISBN: 978-1-56898-790-3
2. Greg Lynn: Form. Rizzoli. Nov 2008. ISBN: 9780847831029

Suggested Materials
There are always options and alternatives for materials that can be used for projects in this course. Almost all of the materials for this course can be sourced either at Home Depot or Smooth-On.com.

Assignments & Academic Calendar
Topics, Reading Assignments, Due Dates, Exam Dates

Week 1	Introduction Course Overview 3d Printing Project Assigned. Begin creating models
Week 2	3d Printing Overview Modeling for 3d Printing Final Check on Models Before they are sent off for Printing
Week 3	Keyshot 101 3d Printed models due. Sent off for printing 3d Printed Model Blog Posting 1 Due
Week 4	Data Capture Overview Working in pairs Scan Model using NextEngine and Rapidworks
Week 5	Bootcamp Rhino Scanned and cleaned model completed when you arrive to class Serial Studies overview
Week 6	Rhino 101 Serial Study file setup for laser cutting

Week 7	Studio Day Construct Serial Studies Work on 3d Print Presentation Work on Scanned Model Presentations
Week 8	Midterm Critique: Scanned 3d Model Serial Sculptural Form 3d-Printed Model in Context All Blog Postings Complete
Week 9	Laser Cutting Study I: Focus on Line Slots Prepare files for laser cutting
Week 10	Laser Cutting Study II: Waffle Structures: Architectonic lamp Lamp Cutting Assignment Assigned Work on Massing Forms
Week 11	Lamp Project Workflow: Sections and Contours Cut My Ribs and Pipe Workflow Final Model layout for laser cutting
Week 12	Geometric Unfolding Overview:Digital Origami Laser Cutting StudyII: Patterns of Polyhedra Focus on Illustrator, Laser Cutting Setup
Week 13	Bring completed Polyhedra to class Chess Project Assigned: Pepakura Workflow Overview Part 1 Focus on Pepakura
Week 14	Pepakura Workflow Overview Part II Focus on Illustrator: Preparing Models for Laser Cutting
Week 15	Work on Final Projects
Week 16	Final Presentation Pepakura Chess Piece Architectonic lamp

Grading Policy

Students must demonstrate satisfactory achievement of course objectives through fulfillment of course assignments and by contributing to class discussions and critiques. Course assignments will require students to use software and equipment available at the ATEC computer labs and actual objects that have been created by applying digital fabrication processes. Course evaluation will be based upon the following.

Assignment	Weight
3d Print Model **10 Points** are awarded for a clean **STL** file that is completed on the due date for the assignment. A clean file for the 3d print project is a model composed of closed polygonal surfaces without any naked edges or self-intersecting polygons. You should run **CheckMesh** on your file to identify any problems with your model. You will lose 2 points for each day after the deadline until your files are prepared properly.	20 points

10 Points will be awarded during the midterm presentation for placing your model in an architectural context	
3D Scanning Student will scan, clean and output a three dimensional object and output it in Polygonal form (OBJ) and as a NURBS patch surface (IGS). This model may be used as the subject for future projects during the course.	15
Laser Studies There are six exercises **each worth 5 points.** Each of these projects are designed to teach techniques for format files for laser cutting and form exploration. 1. Serial Slicing 2. Modular SlotsWaffle 3. Polyhera Studies Each must be completed by the assigned due date.	15
Blog Posting This is one of the **most significant** aspects of the course and should be given great consideration. Your blog postings represent the documentation of the projects and research that you undertake during the course. it should contain: • Research • Techniques • Artistic Influences • Process Photos • Screen Shots • Renderings • Renderings in Context You should create a Blog stream for each projects that you add to as we move through the course. Note that the blog stream is used to confirm the completion of all projects. **If it is not documented on the blog, it did not happen.** **Model In Context: Rendering** Each project should have a rendering that presents the digital model in a sculptural context. These may be completed at any time during the quarter and posted to the Blogsite. The files will be graded on how well they are intergrated into their defined sculptural contex. things to consider: • Lighting • Material Applications • Shadows • Scale A good practice is to include them as a part of your blog postings. Blog Posting will be evaluated at (Midterm Week 8) and at finals (Week 16)	20
Architectonic Lamp Student Will create an Architectonic Lamp using half lap intersection joints. This exercise will introduce students to advanced modeling and construction techniques in digital fabrication. This project will be a part of the student's final presentation.	15
Pepakura Chess Sculpture Students will work in groups to create large scale chess pieces based on low-poly polygonal models that are formatted for laser cutting using the Pepakura	15

Workflow. These models will be a part of the student's final presentation. Grading for this project will be based on the success of the team.	

Project Evaluation Standards
The following is a list of the basic criteria used to evaluate the design aspects of all your projects. You should seek to attend to all of the following in your work.

Project objectives
1) Timely Completion of Project Objectives. Work that is not complete at the time of critique will be considered late. Work must be presented by the student at the critique to be considered "on time". Work sent to class in your absence is unacceptable unless prior arrangements have been made with the professor. Verbal presentation at the critique is a part of the grade for each project.

2) Objective
Does the work fulfill the objectives and skills to be learned as outlined in the project?

3) Originality:
Does the work go beyond the parameters of the individual assignment?

Formal Standards

1) Composition:
Is the composition structured in such a way that it holds the viewer's interest? What sort of natural and mechanical devices have been employed to create a sense of a complete image? Is the format (horizontal, vertical, diagonal) appropriate? Does the composition work with the surrounding space to create a holistic feeling? Does the work feel complete?

2) Scale:
Is the scale of the work and its relationship to the viewer appropriate? How is activated and negative space used to enhance the work? Is the work easy to read or is it lost because it's too small? How does scale affect the way the viewer engages the work?

3) Proportion:
Is the interplay of components in the work appropriate to one another. Does the work have a feeling of being in proportion to the space it is displayed in and its relationship to the viewer?

4) Value/Color:
Are value and/or color being used to enhance the work's sense of volume, form, and mass? How does the work's visual impact change in different types of light and dark? Does value or color help us to see specific visual or emotional content in the work?

5) Texture:
Does mark making enhance the quality of the work by unifying the entire work? Is the mark making appropriate to the subject matter? Does the overall patterning of the mark feel finished, developed?

4) Presentation:
Is the work professional in its appearance? Is the presentation of the work thoughtfully designed? No work will be accepted that is not properly finished.

5) Craftsmanship:
Is the work professionally executed? Is it built with integrity and permanence? Do model files employ proper layer management?

Points Required for Grade:

A	B	C	D	F
90-100	80-89	70-79	60-69	Below 59 is failing

Course Policies

Make-up exams

Makeup exams are available only to students who have a legitimate excuse for missing an exam, such as illness, scheduled job interview out of town, athletic team event out of town, death in the immediate family, etc. If you know in advance that you must miss an exam, give a written notice to the instructor in advance, and bring documentation to support your anticipated absence.

Late Work

Adherence to deadlines is expected. It is the individual student's responsibility to keep track of the goals and deadlines and to present the work to the class and instructor on the specified dates. For most assignments, late submissions will have one letter grade deducted *for each day late*. No late assignments will be accepted for the Final Project.

Class Attendance

All students are required to be on time and in attendance for each and every class. Two (2) absences are allowed as personal or sick leave for this semester. Students will receive one letter grade reduction for three (3) absences and an additional letter grade reduction for four (4) absences. Students who accumulate five (5) absences or more should withdrawal from the course due to five (5) absences resulting in a failing grade ("F ") for the course.

Punctuality

It is important to attend class on time. Persistent and reoccurring tardiness is disrespectful to the instructor and to your peers. Arriving to class more than 15 minutes late twice will be counted as one (1) absence. Every additional late arrival will result in one (1) absence.

Classroom Citizenship

Cell phones and pagers must be powered off during formal class hours. Do not talk when others (the instructor, guests, and fellow students) are talking. Students will not use the computers for personal reasons (e.g, check personal email, surf web) during class time. Participate in class discussions.

Student Conduct and Discipline:

The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations, which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, A to Z Guide, which is provided to all registered students each academic year.

The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3, and in Title V, Rules on Student

Services and Activities of the university's Handbook of Operating Procedures. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations (SU 1.602, 972/883-6391).

A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.

The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrates a high standard of individual honor in his or her scholastic work.

Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings. Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism and is over 90% effective.

Copyright Violations:
It is a federal crime to reproduce copyrighted software. Anyone caught reproducing software from the UTD labs will be subject to disciplinary action. In addition, anyone caught reproducing outside software in the lab will automatically lose all lab privileges and will be subject to other disciplinary action as deemed necessary.

Email Use:
The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.

UT Dallas Syllabus Policies and Procedures

The information contained in the following link constitutes the University's policies and procedures segment of the course syllabus.

Please go to http://go.utdallas.edu/syllabus-policies for these policies.

The descriptions and timelines contained in this syllabus are subject to change at the discretion of the Professor.