KENNESAW STATE UNIVERSITY

SYLLABUS
SOUTHERN POLYTECHNIC COLLEGE OF ENGINEERING AND ENGINEERING TECHNOLOGY
DEPARTMENT OF ENGINEERING TECHNOLOGY
MET 4490: 3D SCANNING AND REVERSE ENGINEERING
SUMMER 2021

Course Information

Class meeting time: Demonstrations Monday 8:00am-10:45am Q219
                    Open Lab M-F 1pm-4pm
Modality and Location: Lecture Online Asynchronous
                        Hybrid Q219
Syllabus is posted in D2L

Instructor Information

Name: Randy Emert
Email: remert@kennesaw.edu
Office Location: Q226
Office phone: 470-578-7406
Office Hours: T/Th 1pm-3pm
Preferred method of communication: email

Course Description

This course covers 3D scanning methods, criteria, and applications. Reverse engineering will be applied with 3D scanning techniques in mind. Projects will take students from a scanned mesh file through a conversion process to create a complete CAD surface or solid model. A variety of 3D scanners will be used including white light, blue light, and laser scanners to create a 3D scanned image. Industry software will be used to convert files from a 3D scanned image to a CAD file.

Course Materials

Required Texts: Specific reading assignments have been pulled from industry resources.
Technology requirements: Access to internet; Solidworks; Geomagic for Solidworks (located in KSU engineering graphics labs)

Learning Outcomes

Students will be able to:
1.   Scan objects with different 3D scanners: white light, blue light, and laser scanner.
2.   Convert 3D scanned images into CAD surface or solid models.
3.   Identify which type of 3D scanner to use for different applications.
4.   Perform reverse engineering when using 3D scanning applications.

Course Requirements and Assignments

There are eight tutorials from Geomagic for Solidworks to be completed. The software is available in the KSU Engineering Graphics Labs. The software cannot be downloaded but may be accessed through the VMware. (Note accessing off campus through VMware is not very stable). The **Tutorials** are 30% of your grade.

Demonstrations will be provided for at least three different styles of scanners. The demonstrations will need to be completed as shown in class. These **Demonstrations** account for 20% of your grade.

There will be five **Project** grades accounting for 50% of your grade. Projects will require you to use what you've learned from lecture, reading, and the demonstrations.

Evaluation and Grading Policies

Tutorials   30%
Demonstrations   20%
Projects   50%

The tutorial grades will be posted in D2L no later than one week after their due date. The demonstration grades will likewise be posted in D2L no later than one week after their due date. Any discrepancies on tutorials, demonstrations, or projects must be identified through email, remert@kennesaw.edu, within one week of being posted in D2L.

GRADING SCALE:
90% - 100% A
80% - 89% B
70% - 79% C
60% - 69% D
0% - 59% F

Grades will be rounded up if they are > or = .5 or above, for example, an 89.6 is an A, but 79.2 is a C.

Course Policies

Students are expected to attend each lab. If you are unable to attend, send an email to remert@kennesaw.edu to document that you will not be in attendance. Communication is key. If you are aware conflicts email early to notify that you will be missing class. After a demonstration there may not be enough time for everyone to complete the demonstration and the project. Therefore, you will need to come into the lab during the week to complete 3D scanning and tutorial assignments.

All due dates are listed in D2L and the Course Schedule is shown below. If you are unable to meet the due dates due to extenuating circumstances, prior arrangements are required and must be documented through email at remert@kennesaw.edu.

Institutional Policies

Federal, BOR, & KSU Course Syllabus Policies

KSU Student Resources

This link contains information on help and resources available to students: KSU Student Resources for Course Syllabus

Course Schedule

Week	Lecture	Due Date
1	3D Scanning Methods	6/9
2	3D Scanning Criteria	6/16
3	3D Scanning Applications	6/21
4	3D Scanning File Formats	6/28
	Demonstrations	
1	Scan-To-3D	6/7
2	Next Engine	6/14
3	Creaform GoScan!	6/21
4	EinScan	6/28
5	Oculus	7/12
5	Reverse Engineering	7/12
	Projects	
1	Scan-To-3D	6/7-6/21
2	Next Engine	6/14-6/28
3	Creaform GoScan!	6/21-7/6
4	Ein Scan	6/28-7/12
5	Oculus	7/12-7/26
5	Reverse Engineering	7/12-7/26
	Tutorials	
1	Fundamentals: Point Cloud and Polygon Editing (Part 1)	6/9
	Fundamentals: Point Cloud and Polygon Editing (Part 2)	
2	Fundamentals: Scan to Origin Alignment	6/16
	Fundamentals: Autosurfacing	
3	Fundamentals: Cross-Section Tool	6/23
	Fundamentals: Modeling Wizard	
4	Hybrid Modeling	6/30
	Gas Valve Modeling	

This syllabus including scheduling and grading may be modified based on mutual agreement of instructor and student.