Instructor: Prof. Tommy Dang
Email: tommy.dang@ttu.edu
Office hours: 3:00 pm - 4:00 am MWF and available to talk right after the class
Office: Eng Center 306C

Class: MCOM 281, 4:00 pm - 4:50 pm MWF Aug 24, 2020 - Dec 09, 2020
Undergraduate level: Special Topics in Computer Science: Virtual Reality - 37564 - CS 4331 - 003
Graduate level: Special Problems in Computer Science: Virtual Reality - 37882 - CS 5331 - 003

Tutorial Assistant (TA): Ngan Nguyen
Email: ngan.v.t.nguyen@ttu.edu
Office hours: 3:00 pm - 4:00 am MWF, Eng Center 305

COVID-19 statements:

- If Texas Tech University campus operations are required to change because of health concerns related to the COVID-19 pandemic, it is possible that this course will move to a fully online delivery format. Should that be necessary, students will be advised of technical and/or equipment requirements, including remote proctoring software.
- If at any time during this semester you feel ill, in the interest of your own health and safety as well as the health and safety of your instructors and classmates, you are encouraged not to attend face-to-face class meetings or events.

Course Description:

- During the course, students will get hands-on experiences on building AR/VR for various real-world datasets. Students will be accessed their learning through two AR/VR projects and a final exam.
- Extensive computer use is required.

Prerequisites:

- Students are expected to have basic programming skills. Completed material in computer programming topics (e.g. CS 2365: Object-Oriented Programming, CS 3364: Design and Analysis of Algorithms or equivalent) is helpful and required.
- Students majoring in areas other than Computer Science are also encouraged to enroll.
- Please contact the instructor if you are unsure if you satisfy the prerequisites.

Attendance:

Attendance is required. Part of your grade is from your in-class participation/contribution. So, you should consider to go the all classes, make comments, and ask good questions (including contributions on Piazza).

Absence due to religious observance:

The Texas Tech University Catalog states that a student may be excused from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused for this purpose may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused. (see p.51)

Absence due to officially approved trips:

The Texas Tech University Catalog states that the person responsible for a student missing class due to a trip should notify the instructor of the departure and return schedule in advance of the trip. The student may not be penalized and is responsible for the material missed. (see p.50)

Late Work:

Assignments are due when specified, but will be accepted late (with a 20% penalty for each day) until graded work is returned. If you know you will be absent ahead of time, turn your assignment in early.

Ethical Conduct:

- Students are expected to comply with the Texas Tech Code of Student Conduct in all aspects of this class. The Code of Student Conduct may be found from the Student Handbook and/or Office of Student Conduct.
- In order to assure that all students have the opportunity to gain from time spent in class, unless otherwise approved by the instructor, students are prohibited from engaging in any other form of distraction, such as reading newspapers, working on other classes, taking cell phone calls, text messaging, and working on laptop computers. Inappropriate behavior in the classroom shall result, minimally, in a request to leave class.
- Violations of conduct including academic dishonesty, foul language, and classroom citizenship are eligible to be reported to Student Judicial Services.

Evaluation:

All submissions are graded according to the assignment guidelines, course policies, verbal instructions/explanations and materials given in class lectures. The numeric breakdown of your final grade is computed as follows:

	Percentage	What to do	Notes
Project 1:	25%	Human scale scene experienced from the 'inside out'	Individual/group project
Project 2:	25%	Virtual world from data and looking at it from the 'outside in'	Group project (teammates are selected by students/instructor)
Final:	20%	Questions on the lectures and student presentations	After Thanksgiving
Student's Choice Presentations:	10%	of interest to you in the area of VR / AR	Individual
Class Participation:	20%	Comments/Ask questions	Don't ask trivial questions. Can contribute via piazza One contribution is 0.5%. Max 1% per day.
Peer evaluation:	2%	Feeback from teammates	for Project 2

A = 85 - 100%
B = 70 - 84%
C = 55 - 69%
D = 40 - 54%
F = 0 - 39%

Tentative Schedule:

	Topics	Face to face
Week 1: 08/24-28	- Course overview - Covid policies and requrirements Link - Student's Choice is due at 11:59pm, Sunday 08/30	Wed 08/26
Week 2: 08/31 - 09/04	- Project 1 is out - Introduction to Javascript (you can skip the basic tutorials) - Introduction to Aframe and Three.js - Student's Choice presentations	Wed 09/02
Week 3: 09/07 - 09/11	- Labor day - The history of VR, Introduction to VR, VR vs. AR - Aframe tutorial by TA - Student's Choice presentations	Wed 09/09
Week 4: 09/14 - 09/18	- Fundamental units in visual design - More Aframe tutorial - Student's Choice presentations	Wed 09/16
Week 5: 09/21 - 09/25	- Position Tracking - Interaction and Navigation - Student's Choice presentations	Wed 09/23
Week 6: 09/28 - 10/02	- Project 1 link and code is due at 11:59 pm, Sunday 09/28 - Project 1 presentations	Wed 09/30
Week 7: 10/05 - 10/09	- Project 1 presentations - Project 2 is out => Team assignment	Wed 10/07
Week 8: 10/12 - 10/16	- Project 1 review, lessons learned - Introduction to Unity3D - VR hardware and software	Wed 10/14
Week 9: 10/19 - 10/23	- Unity tutorial by TA - Visual rendering - Student's Choice presentations	Wed 10/21
Week 10: 10/26 - 10/30	- Collaboration in VR - Student's Choice presentations	Wed 10/28
Week 11: 11/02 - 11/06	- VR game designs - Student's Choice presentations - Project 2 link and code is due	Wed 11/04
Week 12: 11/09 - 11/13	- Project 2 presentations - Project 2 team report is due	Wed 11/11
Week 13: 11/16 - 11/20	- More added VR lectures (Student may suggest the topic) - Student's Choice presentations	Wed 11/18
Week 14: 11/23	- Student's Choice presentations - Thanksgiving 2020 (no class on Wed and Fri)	No face to face class
Week 15: 11/30 - 12/04	- Final exam review	No face to face class
Week 16: 12/07 - 12/11	- Final exam	No face to face class

Topics and/or dates may be changed during the semester at the instructor's discretion because of scheduling issues, developments in the discipline, or other contingencies.

Textbooks:

No official textbook but there will be some assigned readings. Here are some references:
- Jos Dirksen, Learning Three.js : The JavaScript 3D Library for WebGL, 2015
- Jos Dirksen, Three.js cookbook, 2015
- Andreas Anyuru, Professional WebGL Programming: Developing 3D Graphics for the Web, 2012
- Isaac Sukin, Game development with Three.js, 2013

References:

- https://courses.engr.illinois.edu/cs498sl3/sp2017/
- http://creativecoding.evl.uic.edu/courses/cs491/

Related Pages:
- Aframe
- three.js/
- unity3d/
