CAP 4720: Computer Graphics (Fall 2016)

INSTRUCTOR
Neslisah Torosdagli
email: neslisah@knights.ucf.edu
Office: HEC#213

MEETING TIMES AND PLACE
Tuesdays and Thursdays 6:00PM to 7:15PM in HEC#0117

OFFICE HOURS
Monday and Wednesday: 2:00 PM to 3:30 PM at HEC# 213
Right after class
By appointment

PRE-REQUISITES
COP 3530 (Data structures and algorithms)
MAC 2147 (knowledge of elementary algebra, geometry, trigonometry and elementary calculus).

REQUIRED PROGRAMMING BACKGROUND
The course is heavily development oriented. You will learn theory of concepts and then, we will apply those theories in assignments. In this class, you will be programming in HTML, JavaScript, WebGL and Three.JS.

RECOMMENDED TEXT BOOKS
• WEBGL PROGRAMMING GUIDE by Matsuda
• INTERACTIVE COMPUTER GRAPHICS by Angel

REQUIRED COMPUTATIONAL RESOURCE
A WebGL enabled browser (preferably Chrome and Mozilla) running on any computing hardware (no restriction on the hardware). The following two sites will help you verify whether your browser supports WebGL or not.
• www.doesmybrowsersupportwebgl.com
• get.webgl.org

The student must make arrangement for this required computations resource.

COURSE GOAL
This course will provide an introduction to computer graphics for students who wish to learn the basic principles and techniques of the field and want to write applications themselves. The students will learn graphics programming to create synthetic images/visuals.

TOPICS
Given below is a tentative list of topics to be covered during the course. These topics are to be viewed as general guidelines. The list is not final and will be adjusted as
necessary.

- Mathematical tools for Computer Graphics
- Geometric and Viewing Transformations
- Graphics API (OpenGL), GPU Programming
- Rasterization and Visible Surface Algorithms
- Reflection models and Surface Shading
- Texture Mapping, Anti-aliasing
- Data Structure for rendering and scene modeling
- Curves and Surfaces
- Advanced rendering techniques

**RESOURCES FOR THE CLASS**

**THREE.JS**
- Online Books at UCF Library:
  - Learning Three.js: The JavaScript 3D Library for WebGL by by Dirksen, Jos
  - Game Development with Three.js by Sukin, Isaac.
  - Beginning WebGL for HTML5 by Danchilla, Brian.

**JAVASCRIPT**
- Javascript Tutorial: W3 Schools
- Javascript Documentation: Mozilla Developer Network

**HTML**
- HTML Tutorial: W3 Schools
- HTML Documentation: Mozilla Developer Network

**MATH**
- http://paulbourke.net/

**GENERAL POLICIES**

**UCF's Golden Rule:** As reflected in the UCF creed, integrity and scholarship are core values that should guide our conduct and decisions as members of the UCF community. Plagiarism and cheating contradict these values, and so are very serious academic offenses. Penalties can include a failing grade in an assignment or in the course, or suspension or expulsion from the university. Students are expected to familiarize themselves with and follow the University Rules of Conduct (see http://www.goldenrule.sdes.ucf.edu/).

**Student's Academic Activity Verification Policy:** As of Fall 2016, all faculty members are required to document students' academic activity at the beginning of each course. In order to document that you began this course, make sure to complete the first assignment by the by the deadline (Aug 26). Failure to do so will result in a
delay in the disbursement of your financial aid.

**EVALUATION**

The progress of the student will be evaluated through regular assignments, and exams.  
Total Points : 100  
- Programming assignments: 60 Points.  
  - Practice Assignments (Tentatively 6 assignments): 36 Points.  
  - Final Project: 24 Points.  
- Written Assignments: 5 Points.  
- Exams: 35 Points  
  - Short Practice Exams (Frequent 15-30min duration held during class hours): 10 Points.  
  - Final Exam (date: check UCF Calendar): 25 Points.  

A Rough Guideline for Points to grade conversion:  
- A: 90 and above  
- B: 80 - 84 points (B+: 85-87, A-:88-89)  
- C: 70 - 74 Points (C+: 75-77, B-:78-79)  

**SHORT EXAM POLICIES**  
- Short exams will be held frequently, during class hours.  
- The exams will be of closed book nature.  
- The questions will be on the theoretical and programming concepts covered in the class and in the assignments.  
- There will be no make up for the exam. Students missing an exam will receive a zero grade for that exam.  

**PROGRAMMING ASSIGNMENT POLICIES**  
- The practice assignments may be discussed with others, and with the instructor, but must be completed and submitted individually.  
- Practice assignment difficulty level will increase as the semester progresses.  
- The practice assignments must be turned in by deadline date and time, mostly set to 11:59pm of the date.  
- Assignment and project submission is through WebCourses.  
- No late submission allowed.  
- All programming assignments must be done in HTML and Javascript using Three.JS or WebGL as specified.  

**PROJECT POLICIES**  
- The major project must be completed and demoed on or before our last class day (Dec 1).  
- Each group can be composed of maximum 2 students.  
- Project subject should be e-mailed to me latest on 4th of October.
• A 2-page report describing the algorithm should be submitted with the source code through WebCourses.
• Project report written in Latex (any article format is acceptable) will receive +3 bonus points.
• Project will be presented at the end of the semester at a randomly set order by me for 10-20 minutes arranged according to number of registered students.

**IMPORTANT DATES**

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