Instructor: Dr. Frederick C Harris, Jr.  
- E-mail: Fred.Harris@cse.unr.edu  
- Phone: (775) 784-6571  
- Office: SEM 240A  
- Office hours: M, W, F: 10:00am-10:50am

Class webpage: http://www.cse.unr.edu/~fredh/class/791Y/791Y-S2016.php

Teaching Assistants:  
- 
  - E-mail:

Lectures:  
- Monday, Wednesday, Friday: 9:00am-9:50am, LMR 355 (will probably meet in AB 632)

Labs:  
- none

Important Notes and Dates:  
- Final Exam: Friday May 6, 2016 2:45pm-4:45pm  
  - This will probably move to Tues May 10  
- Holidays:  
  - M, W, F March 21, 23, and 25 (Spring Break)

Required Textbooks:  
- Understanding Virtual Reality: Interface, Application, and Design  
  by William R. Sherman and Alan B. Craig -- Morgan Kaufmann Amazon Link

Supplemental Books:  
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Course Description:  
Catalog:  
- (y) scientific visualization. May be repeated for different topics.

Prerequisites:  
- Courses:
  - CS 302 (Data Structures).
  - CS 480/680 (Computer Graphics)
Topics:
- a good working knowledge of programming in C
- Open GL Programming
- OpenGL Shader Programming
- The ability to program on a Unix System

Course Objective:
Students will demonstrate an understanding of the fundamental principles underlying virtual reality (VR) and VR programming

Graduate Student Outcomes and Course Outcomes:
The course outcomes are skills and abilities students should have acquired by the end of the course. These outcomes determine how the general CSE Graduate Student Outcomes apply specifically to this course. All CSE Graduate Student Outcomes are listed in the next subsection and those relevant to this course are identified in the following Table.

<table>
<thead>
<tr>
<th>CSE Graduate Student Outcomes</th>
<th>Course Outcomes</th>
<th>Assessment Methods/Metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Students are capable to understand and apply state of the art methods in Virtual Reality (3D tracking, interaction, etc).</td>
<td>Project.</td>
</tr>
<tr>
<td>b</td>
<td>Students must be able to design and build a Virtual Reality Application and assess it.</td>
<td>Project, Paper presentations.</td>
</tr>
<tr>
<td>c</td>
<td>Students are better prepared to analyze a problem and assess the strengths and weaknesses of different methods and techniques for solving it.</td>
<td>Paper presentations.</td>
</tr>
</tbody>
</table>

CSE Graduate Student Outcomes:
- a. an ability to apply engineering and computer science research and theory to advance the art, science, and practice of the discipline.
- b. an ability to design and conduct experiments as well as to analyze, interpret, apply, and disseminate the data.
- c. an understanding of research methodology.
Course Topics:
- Introduction to Virtual Reality
- VR Hardware
- VR Software

Course Policies:
- Students are expected to attend, and be on time, for every class. This demonstrates professionalism and consideration for your fellow students and your Instructor. While the course does not have an attendance policy, students who miss class and/or are late for class may experience an impact on their grade by missing classroom activities and/or quizzes.
- Students are expected to turn in all assigned materials in a timely manner.
- Students are expected to demonstrate professionalism and courtesy by either silencing or turning off all cell phones and/or other alarm or audible indicator devices.
- The Instructors reserve the right to add to, and/or modify any of the above policies as needed to maintain an appropriate and effective educational atmosphere in the classroom and the laboratory. In the case that this occurs, all students will be notified in advance of implementation of the new and/or modified policy.

UNR Athletics:
- If you are involved with any university-sponsored athletic activities that will have an impact on your attendance, please provide your Instructor with a letter from your coach and/or the UNR Athletic Department as soon as possible, but no later than the end of the second week of classes. This should include the official schedule of your activities which will impact your attendance throughout the semester.

Assignments, Examinations and Grading:
- The major component of this course (as seen in the grading structure) are the programming assignments.
- **Start the programming assignments early!** Completing these projects is a rewarding task, which is made much easier by giving adequate forethought to design. The project components are assigned in roughly increasing order of size and difficulty; proportionately more time is allotted for the later assignments. Later assignments will be weighted more heavily in the final grade. Programs will be evaluated for correctness, organization, and documentation.
- Documentation and structuring should be incorporated into programs from the beginning. Neither the instructor, teaching assistants, nor readers will help with incomprehensible programs.
- Programming assignments are to be done individually unless otherwise specified.
- Programming assignments are due at the beginning of class (9:00am) on the date specified. All programming will be done in ANSI C or C++ using your individual accounts. You may use any computing facilities available to you.
- All Formal Homework Assignments (Including exercises and Projects) and all Exams (Quizzes, Hour Exams, and the Final) are to be treated as individual and not collective efforts, **unless specified otherwise.** A severe penalty will be given to any assignment
which indicates collusion or cheating. The usual penalty for cheating on project or an exam is failure in the course.

**Homework Assignments:**
- There will be a number of Homework Assignments. These consist of practice questions which are intended to assist the student in mastering the course content. Some of these assignments will be collected and graded, but you will be informed in advance when an assignment is to be handed in.

**Quizzes:**
- There will be weekly quizzes (typically on Monday) covering material from the previous week.

**Exams:**
- There will be one or two midterm examinations covering the theoretical material from the first half of the course.
- Permissions to take exams on other dates than scheduled will not be given, except for extreme medical emergencies.
- All exams will take place in the regular classroom.

**Paper Presentations:**
- There will be 2 paper presentations for each student.
- Students are to read a paper which discusses a facet of Virtual Reality.
- Your presentations will be 15 minutes in length followed by 5 minutes of question/answer, and must be prepared as if presented in a formal conference.

**Late Submission Policy:**
- Projects will be collected at the start of the class session in which they are due. A programming assignment turned in after collection is done will be graded as late.
- The penalty for late assignments and projects will be as follows: \( \text{max}(10\%, n^2\%) \), where \( n \) is the number of school days.

**Grading Structure:**
- The final grade will be based on (Tentative, subject to change):

<table>
<thead>
<tr>
<th>Section</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attendance/Participation/Homework</td>
<td>5%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10%</td>
</tr>
<tr>
<td>Projects</td>
<td>40%</td>
</tr>
<tr>
<td>Midterm Exams</td>
<td>20%</td>
</tr>
<tr>
<td>Final Project</td>
<td>20%</td>
</tr>
<tr>
<td>Presentation</td>
<td>5%</td>
</tr>
</tbody>
</table>
Important Notes:
- I will be using a +/- grading system.
- Every project must be completed, working, and turned in. For each project that is not, the final grade in the course may be lowered.

Academic Integrity:
Students are encouraged to study together, however each student must individually prepare his/her solutions. Cheating or plagiarism are not permitted and will be sanctioned according with the UNR policy on Academic Standards. You should carefully read the section on Academic Dishonesty found in the Policies section of the Office of Student Conduct. (copies of this section are on-line at http://www.unr.edu/student-conduct/policies/university-policies-and-guidelines/academic-standards/policy). Your continued enrollment in this course implies that you have read it, and that you subscribe to the principles stated therein.

Academic Success Services:
Your student fees cover usage of the Math Center (784-4433 or www.unr.edu/mathcenter/), Tutoring Center (784-6801 or www.unr.edu/tutoring/), and University Writing Center (784-6030 or www.unr.edu/writing_center). These centers support your classroom learning; it is your responsibility to take advantage of their services. Keep in mind that seeking help outside of class is the sign of a responsible and successful student.

Disability Statement:
If you have a disability for which you will need to request accommodations, please contact me or someone at the Disability Resource Center (Thompson Building, Suite 101), as soon as possible to arrange for appropriate accommodations.

Class Recording:
Surreptitious or covert video-taping of class or unauthorized audio recording of class is prohibited by law and by Board of Regents policy. This class may be videotaped or audio recorded only with the written permission of the instructor. In order to accommodate students with disabilities, some students may have been given permission to record class lectures and discussions. Therefore, students should understand that their comments during class may be recorded.