CS488/688 - Introduction to Computer Graphics

Winter 2015

Course Outline

School of Computer Science, University of Waterloo

Instructor: Gladimir V. G. Baranoski, DC3520

Regular Office Hours: Friday (4-5PM)

Lecture Times: Monday and Thursday, from 4:00 to 5:20PM, MC4041.

Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Assignments/Project/Exams</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>January 15, Thursday</td>
<td>Assignment 0</td>
</tr>
<tr>
<td>3</td>
<td>January 22, Thursday</td>
<td>Assignment 1</td>
</tr>
<tr>
<td>5</td>
<td>February 5, Thursday</td>
<td>Assignment 2</td>
</tr>
<tr>
<td>6</td>
<td>February 12, Thursday</td>
<td>Midterm Exam (4:00PM, Room: MC4045)</td>
</tr>
<tr>
<td>8</td>
<td>February 26, Thursday</td>
<td>Assignment 3</td>
</tr>
<tr>
<td>9</td>
<td>March 5, Thursday</td>
<td>Assignment 4</td>
</tr>
<tr>
<td>10</td>
<td>March 12, Thursday</td>
<td>Project Proposal</td>
</tr>
<tr>
<td>11</td>
<td>March 19, Thursday</td>
<td>Project Revised Proposal</td>
</tr>
<tr>
<td>13</td>
<td>April 1, Wednesday</td>
<td>Project code</td>
</tr>
<tr>
<td>13</td>
<td>April 2, Thursday</td>
<td>Project demos</td>
</tr>
<tr>
<td>13</td>
<td>April 3, Thursday</td>
<td>Project demos</td>
</tr>
<tr>
<td>14</td>
<td>April 6, Monday</td>
<td>Project report</td>
</tr>
</tbody>
</table>

Important Notes: The deadline for the submission of assignment code is 3:30PM on the days specified as the assignment due dates. The deadline for the project code is 8:00PM on the day specified above. Assignments and project materials submitted after these deadlines will receive ZERO marks. Assignments and project written documents (reports and proposals) should be handed in at the beginning (first five minutes) of the lectures given at the above specified due dates. Assignments will be returned in class after they have been marked.

Course TAs:

- Reza Adhitya Saputra (radhitya@uwaterloo.ca). Office hours: Tuesday, 1-2PM, DC2303.
- Egor Larionov (elariono@uwaterloo.ca). Office hours: Wednesday, 1-2PM, DC2303.
Course Description
Software and hardware for interactive computer graphics. Implementation of device drivers, 3-D transformations, clipping, perspective, and input routines. Data structures, hidden surface removal, colour shading techniques, and some additional topics will be covered.

Course Objectives
At the end of the course you should be able to:

- write interactive 3D computer graphics programs;
- understand how linear and perspective transformations are used in modeling and rendering in 3D computer graphics;
- understand the process of rendering, lighting, hidden surface removal, and other computer graphics techniques;
- write a simple ray tracer.

Required Text
- CS488/688 Course Notes.

Recommended Texts
- OpenGL Programming Guide.

General Overview of Topics
- The Graphics Environment
- Mathematical Underpinnings
- Transformations
- Picking, Selecting, and Control Tasks
- Hidden Surfaces and Shading
- Ray Tracing
- Physically Based Rendering
- Splines
- Animation
Marking Scheme

- Assignments: 24%
- Project: 26%
- Midterm: 20%
- Final: 30%

Students must average at least a 50% in both the programming and examination components of the course to pass. If a student fails to obtain a passing grade on either component, his/her final mark is going to be the mark obtained in this component. The instructor reserves the right, where appropriate, to adjust raw marks downward in the case of cheating and upward in other situations.

Course Delivery and Expected Behaviour

For this offering, class attendance will be particularly critical. Course delivery will consist mostly of traditional lectures with occasional use of slides and technical demonstrations. During the lectures, the use of personal computers (or other devices) for activities outside the scope of the course is not allowed. All assigned work will be individual.

Course Work Policies

- Marked work will be first returned in lectures and then available during the instructor’s office hours.
- Any assignment submission that remains unclaimed by May 31, 2015, will be destroyed.
- Students should contact the teaching assistants about concerns with respect to the marking of submitted work within two weeks of the date it was first returned to the students. If the issues cannot be solved between the teaching assistant and the student, the teaching assistant will meet with the instructor, who will make the final decision.
- Use the piazza for general questions about assignments that may be of interest to other students in the course. Do not discuss implementation details (such as code particulars) via piazza. Use the following link to sign up to piazza:

  https://piazza.com/uwaterloo.ca/winter2015/cs488

- Use the course e-mail for simple technical issues pertaining only to you.
- Issues requiring detailed answers should be addressed during course staff’s office hours.

University Mandatory Information

Academic Integrity: In order to maintain a culture of academic integrity, members of the University of Waterloo community are expected to promote honesty, trust, fairness, respect and responsibility. [Check www.uwaterloo.ca/academicintegrity/ for more information.]
Grievance: A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read Policy 70, Student Petitions and Grievances, Section 4, \texttt{www.adm.uwaterloo.ca/infosec/Policies/policy70.htm}. When in doubt please be certain to contact the department’s administrative assistant who will provide further assistance.

Discipline: A student is expected to know what constitutes academic integrity [check \texttt{www.uwaterloo.ca/academicintegrity/}] to avoid committing an academic offence, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about ‘rules’ for group work/collaboration should seek guidance from the course instructor, academic advisor, or the undergraduate Associate Dean. For information on categories of offences and types of penalties, students should refer to Policy 71, Student Discipline, \texttt{www.adm.uwaterloo.ca/infosec/Policies/policy71.htm}. For typical penalties check Guidelines for the Assessment of Penalties, at the following web site \texttt{www.adm.uwaterloo.ca/infosec/guidelines/penaltyguidelines.htm}.

Appeals: A decision made or penalty imposed under Policy 70 (Student Petitions and Grievances) (other than a petition) or Policy 71 (Student Discipline) may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to Policy 72 (Student Appeals) \texttt{www.adm.uwaterloo.ca/infosec/Policies/policy72.htm}.

Note for Students with Disabilities: The Office for persons with Disabilities (OPD), located in Needles Hall, Room 1132, collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the OPD at the beginning of each academic term.