Techniques for Evaluating Game Design

CSC 591/495
Fall 2012
Tu/Th 5:20-6:35pm EBIII Room 2201

Instructor: Dr. David L. Roberts (robertsd@csc.ncsu.edu), 2254 EBII, 919-513-7182
Office Hours: Monday 3:30-5:00, Tuesday 12:00-1:30, and by appointment.
Course Webpage: [http://www.csc.ncsu.edu/faculty/robertsd/csc591495f12/](http://www.csc.ncsu.edu/faculty/robertsd/csc591495f12/)

Teaching Assistant: Jerry Yang (pyang3@ncsu.edu), 2246 EBII
Office Hours: Wednesday 2:00-4:00pm, EB2 Rm2246 or by appointment.

Course Purpose: In this course we will examine some of the factors that contribute to the success (or failure) of computer games. We will also cover techniques that allow designers to gain insight into those factors. Topics include the cognitive and emotional responses players have to computer games such as presence, engagement, fun, enjoyment, agency, flow, and challenge.

Although there are games in which computers play head-to-head, in this course we will focus on games as a playable artifact for humans. In doing so, we will study scientific evaluation methodologies and discuss how they can be applied to games. Topics in this area will include experimental design, evaluation metrics, and basic statistics for data analysis. In contrast to a more engineering-focused experimental methods course, we will also cover qualitative methods including observational research, grounded theory, think-alouds, and ideographic analysis. Each of these methods, whether quantitative or qualitative, will be discussed specifically in the context of computer games.

Course assessment will consist of exams and a series of homework and reading assignments. Students enrolled in CSC591 will additionally conduct a semester-long project.

Course Objectives: By the end of the course, you should be able to accomplish the following:

- Define factors that characterize players’ experiences with games (e.g., fun, enjoyment, engagement, flow, etc).
- Design and carry out a game evaluation study with human subjects.
- Critically analyze research study design, especially in the context of evaluating computer games.
- Perform statistical analyses using SPSS, R, SAS, or a similar statistical analysis software package.

Course Text: There is no official text for this course, although we will cover many of the topics from the following books:


Course prerequisites:

• For CSC495: CSC316. While not required, familiarity with topics in human computer interaction (e.g., CSC 454) will likely prove beneficial.

• For CSC591: Graduate standing in Computer Science, or senior undergraduate standing as a CSC concentrator. While not required, familiarity with topics in human computer interaction (e.g., CSC 554) will likely prove beneficial.

Policies and Procedures

Academic Integrity: Students are required to follow NCSU policy. “Academic dishonesty is the giving, taking, or presenting of information or material by a student that unethically or fraudulently aids oneself or another on any work which is to be considered in the determination of a grade or the completion of academic requirements or the enhancement of that student’s record or academic career” (NCSU Code of Student Conduct). It is the instructor’s understanding and expectation that the student’s submission of any assignment means that the student contributed to the assignment in question (if a group assignment) and that they neither gave nor received unauthorized aid (if an individual assignment). Authorized aid on an individual assignment includes discussing the interpretation of the problem statement, sharing ideas or approaches for solving the problem, and explaining concepts involved in the problem. Any other aid would be unauthorized and a violation of the academic integrity policy. This includes referring to homework from previous semesters. Any computer work submitted must be completed on your own personal computer or from your own NCSU account to avoid confusion about the origin of the files, and no sharing of files in any way is allowed on individual assignments and no inter-group sharing is allowed on group assignments. All cases of academic misconduct will be submitted to the Office of Student Conduct. If you are found guilty of academic misconduct in the course, you will be on academic integrity probation for the remainder of your years at NCSU and may be required to report your violation on future professional or school applications. More information can be found online at www.ncsu.edu/provost/academic_regulations/integrity/reg.htm.

Homework: Students will submit homework individually. The assignments will either be posted on the course webpage, moodle, or distributed in class. If you are unable to attend class, it is your responsibility to determine if an assignment was given. Unless otherwise noted, all homework
assignments will be due by the start of class on the day they are due. Late assignments will be considered according to the late submission policy described below.

**Homework Grading**: Homework assignments will be given full earned credit for timely completion. Missing components or lateness will be penalized accordingly.

**Late Homework**: Completed assignments should be turned in by the beginning of the class period on the date they are due. For assignments for which email or other electronic submission is requested, the submission should be completed before the start of the class period on the date they are due. Every student has four days which they may allocate to late assignments throughout the semester at a cost of five points per day. Once the allotment of four days has been used, there will be no more late submissions accepted. For every day an assignment is late, the grade will be reduced by five (5) points. For example, a student who submits the first assignment three days late (and receives 15 points off of their grade) only has one day remaining for all subsequent assignments.

Valid excuses such as illnesses with a note from a doctor or a death in the family (with documentation) will be granted extensions to deadlines, provided the documentation is presented to the instructor in a timely manner. Other extensions may be granted for other scholarly activities provided arrangements are made with the instructor well in advance of the deadline.

**Exams**: This course will have two exams: a midterm and a final. The midterm will be given in class on 10/11. The final exam is scheduled from 6:00 – 9:00 on 12/6.

**Course Project (CSC 591 only)**: Students will conduct a semester-long group project on a topic of their choosing (approved by the instructor). Details about the project, grading desiderata, and deadlines can be found on the course webpage and will be distributed in class. Students are highly encouraged to work closely with the instructor on their project or to seek a separate faculty mentor. Periodically throughout the semester, students will be asked to present updates on their project progress. These updates will be graded and contribute to the overall project grade.

**Project Reviews (CSC 495 only)**: Students enrolled in CSC495 will be expected to write double-blind reviews of project proposals, papers, and final submissions of students enrolled in CSC591. Students will be assigned 23 projects to review throughout the semester and will be graded on the quality of the feedback they provide to project participants. Details about the project, grading desiderata, and deadlines can be found on the course webpage and will be distributed in class well in advance of any deadlines.

**Class Evaluations**: Online class evaluations will be available for students to complete during the last two weeks of the semester. Students will receive an email message directing them to a website where they can login using their Unity ID and complete evaluations. All evaluations are confidential; instructors will never know how any one student responded to any question, and students will never know the ratings for any particular instructors.

**Course Format**: This will be a lecture course covering topics in computer game design and experimental methods. Students will be given three homework assignments throughout the semester.
There will be a midterm and a final exam. Students enrolled in the 591 section will conduct a semester-long project implementing a game evaluation technique of their choosing for a computer game of their choosing and will summarize their projects in an eight page paper as well as an in-class presentation. Students enrolled in the 495 section of the course will review the project work of 591 students at three points throughout the semester.

**Attendance:** Attendance at class sessions is not required; however, unexcused absences that result in late assignments or missed announcements may negatively affect students’ grades. Documented medical excuses or other excused absences will not adversely affect grades. Conference travel or other scholarly duties discussed well in advance of a missed session may be excused at the discretion of the instructor.

**Calculation of course grade:** Grades will be computed with a weighted average using the following weights.

For CSC591:
- Homeworks (3): 30%
- Project: 40%
- Midterm exam: 10%
- Final exam: 20%

For CSC495:
- Homeworks (3): 40%
- Reviews: 20%
- Midterm exam: 15%
- Final exam: 25%

In addition, there may be opportunities for extra credit throughout the semester. Such opportunities may include attending lectures relevant to course topics, or participating in research studies. Each opportunity will be made available to the entire class and awarded points towards the final grade as determined by the instructor on a case-by-case basis. Students are welcome to suggest extra credit opportunities to the instructor, but no guarantees are made about which will be offered.

Course grades will be determined as follows:

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<thead>
<tr>
<th>Score</th>
<th>x ≤ 60</th>
<th>60 ≤ x &lt; 63</th>
<th>63 ≤ x &lt; 67</th>
<th>67 ≤ x &lt; 70</th>
<th>70 ≤ x &lt; 73</th>
<th>73 ≤ x &lt; 77</th>
<th>77 ≤ x ≤ 80</th>
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<tbody>
<tr>
<td>Grade</td>
<td>F</td>
<td>D-</td>
<td>D</td>
<td>D+</td>
<td>C-</td>
<td>C</td>
<td>C+</td>
</tr>
<tr>
<td>Score</td>
<td>80 ≤ x &lt; 83</td>
<td>83 ≤ x &lt; 87</td>
<td>87 ≤ x &lt; 90</td>
<td>90 ≤ x &lt; 93</td>
<td>93 ≤ x &lt; 97</td>
<td>97 ≤ x</td>
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<tr>
<td>Grade</td>
<td>B-</td>
<td>B</td>
<td>B+</td>
<td>A-</td>
<td>A</td>
<td>A+</td>
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Students enrolled for credit only will receive a grade of “S” if they earn a “C-” or greater, and a grade of “U” otherwise.

**Students with disabilities:** Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with
Disability Services for Students at 1900 Student Health Center, Campus Box 7509, 919-515-7653. See also the web page on disability services for students (http://www.ncsu.edu/dso/).

Schedule

The schedule is subject to change pending student interests and background. The official schedule will be kept on the course webpage here: http://www.csc.ncsu.edu/faculty/robertsd/csc591495f12/schedule.php. The official schedule will be updated periodically to reflect changes as the semester progresses. It is the student’s responsibility to check the schedule regularly for changes. The instructor will communicate any changes in deadlines to students in a timely manner via email and/or announcements in class. Note, it is the student’s responsibility to check their official NCSU email address at least once daily and to come to class. Failure to do so does not excuse missed deadlines.

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<thead>
<tr>
<th>Lectures</th>
<th>Topics</th>
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<tbody>
<tr>
<td>1</td>
<td>Introduction, Course Overview</td>
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<tr>
<td>2–5:</td>
<td>Artificial Stupidity, Intelligent Mistakes, Affect, Fun, Engagement, Flow, Immersion, Presence</td>
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<td>6:</td>
<td>Research Ethics and the IRB</td>
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<td>7–8:</td>
<td>Validity, Research Designs</td>
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<td>9–15:</td>
<td>Questionnaires for Games, Interviews for Games, Field Research for Games</td>
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<td>16–20:</td>
<td>Qualitative Methods, Think Aloud, Grounded Theory</td>
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<td>21:</td>
<td>Collecting Analytics in Games</td>
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<td>22–23:</td>
<td>Descriptive Statistics for Games</td>
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<td>23–24:</td>
<td>Parametric Statistics for Games</td>
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<td>25–27:</td>
<td>Non-parametric Statistics for Games</td>
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<tr>
<td>28–29:</td>
<td>Project Presentations</td>
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