RESEARCH OPPORTUNITY PROGRAM
299Y/399Y PROJECT DESCRIPTIONS 2019-2020
SUMMER

Name and Title: Steve Engels, Associate Professor, Teaching Stream
Department: Computer Science

TITLE OF RESEARCH PROJECT: Educational Video Game Design

Number of 299Y Spots: 8                           Number of 399Y Spots: 8

OBJECTIVES AND METHODOLOGY:
This research project is seeking to understand what makes educational games effective at engaging and educating
the player. It is clear that design features such as challenge, feedback, immersion and aesthetics play a part in these
educational activities, but research needs to be done to explore the way these design features impact the enjoyment
and learning goals achieved by these games.
This research project uses design research to test how specific design features impact educational games, specifically
for STEM subjects (Science, Technology, Engineering & Math) at the secondary school level. Games are tested for
engagement and learning goals without these features, and then again with these features added. The results of this
study will reveal the design features that contribute to effective games, and how these features can be used by
educational game designers in the future.

DESCRIPTION OF STUDENT PARTICIPATION:
Students who take part in this study will make an educational game for a unit on a particularly challenging STEM
topic. They will then test these games on the target audience, update them with a set of design changes, and then
test the resulting games to observe changes in the motivation and learning of the player. These changes will be
analyzed and compared to the results of the other games in the group, to create a larger picture of how design
features influence these games.

Students are expected to have high grades in their basic programming courses (i.e. CSC108 and CSC148). Other
helpful (but not required) skills are previous experience with education, previous experience with game design, good
performance in other computer science courses, or demonstrated previous interest in this topic.

MARKING SCHEME (assignments with weight and due date):
- Week 1:
  - Level 1 research – 2%
  - Level 1 game design -- 2%
- Week 2:
  - Level 2 research – 2%
- Level 2 game design – 2%
- Game Pitch -- 2%

- Week 3:
  - Tech demo – 5%
  - Game design document -- 5%

- Week 4:
  - Playable prototype -- 5%

- Week 5:
  - Updated prototype -- 5%

- Week 6:
  - Alpha release -- 10%

- Week 7:
  - Testing results -- 5%

- Week 8:
  - Level 3 research – 5%
  - Alpha update outline -- 5%

- Week 9:
  - Alpha update -- 5%

- Week 10:
  - Mini-demo – Not graded.

- Week 11:
  - Beta release – 5%

- Week 12:
  - Final testing session – 5%
  - Analysis & report – 10%

- All weeks:
  - Participation – 10%
  - Design journals – 10%