CSC 192 and CSC 192H – STEM Incubator Course, Section D
3D Printing with Programmable Parts
Syllabus
Fall 2016
Professor Burg

Office: Manchester 237
Phone: 758-4465
Email: burg@wfu.edu
Burg’s Office Hours: Monday and Friday, 11-12 PM
Tuesday, 1 – 2 PM

Course website: The course has a website on Sakai where handouts and other documents will be stored. The site is on Sakai under the course name and section.

Course Description from Wake Forest Bulletin, 2016-2017:
192. Stem Incubator. (1h) An engaging and relevant introduction to STEM (science, technology, engineering, and mathematics) through creative exploration, collaboration, and computational problem-solving. Pass/Fail. May be repeated once.

General STEM Incubator Course Learning Objectives:
Please see http://college.wfu.edu/cs/humanitech-program/program-overview for an overview of the STEM Incubator program (also called "Humanitech") and it's learning objectives.

This section of the STEM Incubator:
CSC192-D and CSC192H-D 3D Printing with Programmable Parts
In this course, students will learn how to design and print 3D objects using 3D modeling software and an in-house 3D printer. They will also design dynamic and movable parts for the objects and program them with microprocessors such as Raspberry Pis or Arduinos. No programming experience is necessary for students in CSC192. Students with programming experience will register as CSC192H and will serve as mentors to the beginning-level students.

Basis for Grade:
The grade for the course is either P (pass) or F (fail).

To receive a passing grade, students must do the following
• Each week, attend one hour regular class meeting and two hours of out-of-class meetings.
• Each team of students should make a weekly blog entry. Your weekly blog entry should state who attended your weekly out-of-class meetings and what was accomplished. Include design plans and implementations for your projects. Pictures, sound, and short videos are a nice addition to the blog entries. Partners should take turns doing the blog entries each week. (The mentors will be a blog as a team as well, giving an overview of what was accomplished during the week.)
• Attend class regularly (DON’T CUT CLASS)
• Create sound and music and make submissions on Sakai as outlined in the schedule below.
• Participate in the creation of a midterm and final presentation in which the sounds and music you created are shared and explained.
Honor System
Wake Forest is an academic community that subscribes to an honor system. By accepting membership in this community, each student assumes the obligation to be trustworthy in all pursuits. Violations may be referred to the Judicial Council for investigation and determination of appropriate sanctions.

Special Needs
If you have a disability that may require an accommodation for taking this course, then please contact the Learning Assistance Center at (758-5929) within the first two weeks of the semester.
Plan in Event of Extended Campus Closing

Please note the following plan to be followed in the event that the Wake Forest campus is closed for an extended period of time and we are unable to have our regularly-scheduled class meetings.

In normal circumstances, please contact me through my campus email address or campus telephone number.

campus email: burg@wfu.edu
campus telephone: 758-4465

In emergency situations or situations where the campus is closed, you may also use the following contacts:

e-mail: burgji@gmail.com
cell phone number: (336) 407-3743

Your course information, including a schedule of assignments, will be posted on Sakai.

If we are able to meet before the campus is closed, I'll give you an updated schedule and instructions at that time.

After leaving campus, you should consult the schedule website regularly for updates to the schedule.

Be sure to take your book, computer, and course notes home with you in the event that the campus is closed. We’ll continue with projects, communicating through the internet, email, and/or hard mail.

Assignments will be posted on Sakai as usual, and you can submit your assignments on Sakai.

If the internet is down, I will mail your assignments to you in hard copy, and, by return address, you should mail back a flash memory drive containing the source code for the implemented program. I’ll return the flash drive to you later.
## Schedule

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<thead>
<tr>
<th>Week Of</th>
<th>Assignment</th>
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| Wed., Aug. 31 | **Wednesday class activities:**  
• Look at last semester's projects.  
• Discuss how the printer is used.  
• Divide into pairs for projects.  
**Assignment:**  
• Begin planning your midterm projects with your partner.  
• Think about what supplies you need.  
• Set up a blog site for your team on WordPress and make first blog entry. |
| Wed., Sept. 7 | **Wednesday class activities:**  
• Go to course website on Sakai and review assignments.  
• Install Sketchup and Makerbot Desktop (Get Sketchup for educational use, which is free.)  
• Get an overview of how Sketchup and Makerbot are used.  
• Bookmark video demos to look at them later.  
• Bookmark Thingiverse and other useful websites.  
• Get an overview of the kinds of things that can be done with Arduinos and Raspberry Pis.  
**Assignment:**  
• Each pair of students should model and print a simple object by next week and submit the stl and x3g files on Sakai.  
• Continue planning your midterm project with your partner.  
• Go over your plan with your mentor.  
• Begin working on the project.  
• Blog. |
| Wed., Sept. 14| **Wednesday class activities:**  
• Troubleshoot printing problems.  
• Go over file settings for rafts and supports  
• Practice changing filament.  
**Assignment:**  
• Write a description of the midterm project you've decided to do with your partner (between one paragraph and one page) – what you will make, how you will do it, and the supplies you will need. Submit this on Sakai before the next class.  
• Work with your partner on your midterm project  
• Blog. |
| Wed., Sept. 21| **Wednesday class activities:**  
• Install Arduino.  
• Go over simple Arduino programming. |
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<thead>
<tr>
<th>Date</th>
<th>Class Activities</th>
<th>Assignment</th>
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<tbody>
<tr>
<td>Wed., Sept. 28</td>
<td>Look at examples in Arduino books in lab and at online examples.</td>
<td>Assignment: Make something happen with your Arduino – a light blink, as sensor react, a sound, etc. Work on your project with your partner. Blog.</td>
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<td>Tues., Oct. 4</td>
<td>Last day to drop</td>
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<td>Wed., Oct. 12</td>
<td>Midterm Project Demos – All STEM Sections</td>
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<td>Fri., Oct. 21</td>
<td>Fall Break</td>
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<td>Wed., Oct. 26</td>
<td>Wednesday class activities:</td>
<td>Assignment: Write a description of the final project you've decided to do with your partner (between one paragraph and one page) – what you will make, how you will do it, and the supplies you will need. Submit this on Sakai before the next class. Continue working on final project. Blog.</td>
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<tr>
<td>Wed., Nov. 2</td>
<td>Wednesday class activities:</td>
<td>Assignment: Continue working on final project. Blog.</td>
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<tr>
<td>Date</td>
<td>Activities</td>
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| Wed., Nov. 9 | **Wednesday class activities:**  
  • Continue working on final project.  
  **Assignment:**  
  • Continue working on final project.  
  • Blog. |
| Wed., Nov. 16 | **Wednesday class activities:**  
  • Continue working on final project.  
  **Assignment:**  
  • Continue working on final project.  
  • Blog. |
| Nov. 23 – Nov. 27 | Thanksgiving Break                                                                 |
| Wed., Nov. 30 | **Wednesday class activities:**  
  • Continue working on final project.  
  **Assignment:**  
  • Submit your Arduino code and your *stl* and *x3g* files on Sakai before the next class.  
  • Create PowerPoint presentation explaining what you've created for your final project and how you did it (about 4 – 6 slides). Upload the slides to Sakai before class.  
  • Continue working on final project.  
  • Blog. |
| Wed., Dec. 7 | **Final Project Demos – All STEM Sections** |