Syllabus - COMP402 - Senior Project - Implementation

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1 Logistics

- **Where:** Center for Science & Business, Room 303
- **When:** Th 12-12:50pm
- **Instructors:**

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- **Website:** `http://jlmayfield.github.io/MC-COMP401-402/`
- **Credits:** $\frac{1}{2}$ course credit

2 Course Content and Goals

The senior project is the culminating experience of a student's major in Computer Science. It calls upon students to draw on everything they have learned over the course of their studies. The project itself is a means to an end and not the ultimate goal of the capstone experience. Sufficiently interesting and complex projects rely on an abundance of existing research and fundamental principals of computing. Through out the course of the capstone experience, students will identify and understand this context, learn to work in this context by way of completing your project, and communicate these ideas to technical and non-technical people by using the specifics of the project as the concrete instantiation of this context.

COMP 402 is focused on the implementation of the plans proposed by the student in COMP401 and the identification of fundamental principles at play within the various facets of the project. The class will give checkpoint presentations on a semi-regular basis in order to receive feedback from peers and faculty regarding the current state of student projects and their underlying fundamentals. At the end of the semester, students will use their project as the basis for a Scholar's Day poster and accompanying presentation.

Students are ultimately working towards pinpointing general, abstract, or theoretical concepts that support their project and clearly articulating how their work is a specific instance of these concepts. An important part of this process is the identification of seminal scholarly work that addresses the concept and its applications. Student's too often attempt to reinvent the wheel in the course of their capstone work. Occasionally they're unaware that the wheel already exists. The emphasis on fundamentals is about identifying the wheels, the documents that lay out the general principles of those wheels, and focusing your energies on

applying those principles to the specific needs of your project. In doing so you will better understand where your work sits in the broad spectrum of computing and can present it as such.

3 Attendance and Expectations

Students in this course are expected to be respectful of their peers and the instructor. As this course is comprised entirely of student presentations, it is crucial that all students are always present and always on time. Failure to arrive on time and be a productive member of the course will have a detrimental effect on the final grade and leaves a bad impression with faculty that are likely targets for job and graduate school recommendations.

4 Course Deliverables

The following elements of COMP402 contribute to the overall capstone grade:

- Checkpoint presentations
- A Scholar's Day Poster
- A Final Presentation
- A publicly available, completed project
- A bibliography of foundational work

4.1 Checkpoints

The class will meet for regular project checkpoints. At these checkpoints each student will give a **five to seven minute presentation** that covers:

1. The state of the project (1-2 minutes):
   (a) The expected state for this checkpoint based off the current time line
   (b) The actual state with a demonstration of progress
   (c) The expected state for the next checkpoint
2. Computing Fundamentals (4-5 minutes)
   (a) Concepts, theories, and abstract principles
   (b) Seminal research and literature
   (c) Project specific instantiations

It is important to note that the bulk of each presentation is dedicated to the presentation of computing fundamentals as they appear in the project. The goal is to get accustomed to presenting the project in the context of a larger issue in computing.

4.2 Scholar's Day Posters & Final Presentations

By the midpoint of the semester students will have identified at least one fundamental principle that acts as a corner stone of their project. One of these principles will become the subject of your poster and final presentation. It is important that students understand that *the project is not the subject of the poster and presentation, it is the vehicle by which the subject is presented.*

The poster will be done in the standard scientific research style. The CSB is ripe with examples of this kind of poster. Students be required to work several drafts of their poster beginning shortly after midterm. Posters will be presented as a part of the Scholar's Day poster session.

The final presentation is a 25-30 minute, general audience presentation. It is the expanded, oral accompaniment to the poster. Presentations will take place the same week as Scholar's Day.

4.3 Completed Project

By the end of the semester each student must have a completed project. It may not be what the exact project proposed in COMP401 but it should be complete by some measurable sense of the word. For example, it may be a rough prototype of the proposed project or lack some of the originally proposed features. What's important is that it stands on its own and that the student presents it as such. Too often students lament the features they didn't get to and overemphasis what the project might have been as opposed to what it finally ended up being.

The final version of the project must be submitted to the instructors by Scholar's Day. In addition to submitting their work to the instructors, students must also find a means of making their work publicly available. Standard paths to this include, but are not limited to:

- Making the project Open-Source and hosting the code on a site like Github.
- Making a completed application available on an app-store or some similar means of distribution.
- Uploading a paper to a pre-print archive.
- Submitting a paper for publication.
- Hosing a website on a public server.

The exact means by which projects are made publicly accessible must be approved by the instructors ahead of time. Projects must be publicly accessible by Scholar's Day.

4.4 Project Bibliography

Over the course of COMP 401 and COMP 402 students should have accumulated several key texts related to the foundational computer science that underlies their project. The project bibliography should list and cite all of these sources. Some of these will be cited on the poster and presentation, some will not. The poster and presentation is an in depth demonstration of the students ability to connect their work to the larger issues in computing. This bibliography is a demonstration of the student's ability to continue this practice across the broad scope of their project. Multifaceted projects should rely on many different ideas and should thereby have a lengthier bibliography. More constrained projects might have shorter bibliographies as a reflection of their narrower focus. Either way, the bibliography should accurately reflect the breadth and scope of the project.

5 Grading

At the completion of this course, the grade for both COMP401 and COMP402 is determined. Students will typically receive the same grade in both courses to reflect the work throughout the capstone project and not in one individual phase of the project. Grades will be determined based on the following items:

- Appropriateness of project difficulty (evaluated during COMP401)
- COMP401 checkpoints
- COMP401 Technical Presentation
- COMP401 Proposal Poster
- CMP401 Written Proposal
- COMP401 Proposal Presentation
- COMP402 Checkpoint Presentations
- COMP 402 Scholar's Day Research Poster
- COMP 402 Final Presentation

- A Completed Project
- A Project Bibliography

More abstractly, what all of the above elements should reflect is a student's:

- effective use of technical and problem solving skills befitting a major in Computer Science
- professionalism
- ability to make informed, mature decisions as they relate to a larger-scale project
- understanding and appreciation of the computing disciplines

6 Schedule

Week	Dates	Assignments
1	1/11 - 1/15	First Meeting
2	1/18 - 1/22	Checkpoint 1
3	1/25 - 1/29	
4	2/1 - 2/5	Checkpoint 2
5	2/8 - 2/12	
6	2/15 - 2/19	Checkpoint 3
7	2/22 - 2/26	
8	2/29 - 3/4	Checkpoint 4
SPRING BREAK	3/7 - 3/11	
9	3/14 - 3/18	
10 EASTER BREAK (Fr)	3/21 - 3/24	Checkpoint 5. Poster Draft Due.
11 EASTER BREAK (Mo)	3/29 - 4/1	
12	4/4 - 4/8	Checkpoint 6. Poster Draft Due.
13	4/11 - 4/15	
14	4/18 - 4/22	Checkpoint 7. Poster Due.
15 FOUNDER'S DAY (Tu)	4/25 - 4/29	Poster Session & Final Presentations. Project Due.
16	5/2 - 5/4	
Final's Week	5/6 (3:00pm)	Exit Interviews

6.1 Course Engagement Expectations

The weekly workload for this course will vary by student but on average should be about 5-7 hours per week. While regular class meetings are scheduled for two hours a week, it is unlikely that we'll use all of that time each week. We therefore expect students to dedicate at least 4-6 hours a week towards the development of their projects. Being a capstone project, it is likely that your weekly work will exceed the expected amount.