CPSC 498: Capstone Project in Computer Science

Course Information

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Course Description

Directed projects or research under the direction of a faculty advisor. Student will engage in planning, analysis, design, and implementation, and documentation of a significant software project, culminating together various techniques and skills learned throughout the curriculum, in an unconstrained, ambiguous problem environment. It is up to the student to cut through this ambiguity to deliver a software solution, under the guidance of a faculty instructor. Choice of problem, choice of tool, and choice of plan are all at the student's disposal.

Pre-requisite: CPSC 270 and senior standing, or consent of instructor.

Course Motivation

The course requirement and deliverable is a significant software development project. You'll have an opportunity to work with a team, and will include my guidance—as a managing/technical consultant if you will—and will provide an opportunity for you to demonstrate and hone your skills outside of the context of a textbook-based "course". This is the inherent difficulty (by design) of a capstone course. That is, you'll have every professional tool at your disposal, but defining and writing the problem, narrowing the scope, choosing the right software tools and hardware, identifying resources, identifying a feasible WBS (work breakdown structure) and schedule, balancing the workload with others, and working with ambiguity are all relatively new (and pragmatic) skills that you will sharpen during the capstone experience.

You will be guided along the way with weekly status meetings in Luter 322, the time which may be allocated between your group meetings, or consulting hours as discussed below.

Consulting Hours

As part of your planning, you will identify stakeholders and other users of the proposed system. However, throughout the course, I will be there to guide you along the way. At times, you may find that you need technical assistance—for this each group will be allotted a small number of consulting hours (depending on the number of groups), as "hired help", to help navigate you through difficult technical areas, identification of new technologies that you may wish to pursue, staffing, project management advice, and the like. How you use these hours is up to you, but be cognizant of and log their use, as they may run out quickly.

Course Deliverables

Project Proposal

Within the first two weeks of classes, the student either identifies a desired project on his/her own or selects one from a list of projects specified by the instructor. Note, the instructor might choose not to propose any projects, in which case it is solely the student's responsibility to find one. On the other hand, the instructor might limit the selection of projects to only one or a few. In that case, no other projects will be accepted. Therefore, it is imperative that students talk to the instructor before preparing a written project proposal.

After identifying a topic, the student will submit a project proposal in writing. The project proposal is due no later than the Friday after the second class meeting. If the student is working with a mentor outside CNU, he/she must have a PCSE faculty advisor.

The project proposal has to be approved by the CNU faculty mentor before its submission. Within one week of submission, project proposals will be reviewed by the instructor and approved or denied. If a project proposal is denied the student must restart the project proposal development and submission process.

A proposal document shall include the following:

- A project title: no more than forty (40) words long, that conveys the nature of the proposed work;
- Student's name, major and project course number;
- Student's mentor's (or advisor's) name(s) and organizational affiliation(s);
- Proposed start and finish dates; and
- 1-3 pages, which contain the following headings (in **bold**):
  - **Abstract** : Executive summary of system to be delivered (1 paragraph)
  - **Business Profile** : Description of the customer/stakeholder and/or the context of the project
  - **Descriptive scenario** : Description of the current state/environment (and any problems that result)
  - **Normative scenario** : What should be the overall outcome?
  - **Motivation** : the motivation for the project (why is it relevant?), and
  - **Plan of Attack**: a list of high level objectives ordered by priority (which specific objectives need to be achieved to consider the project a great/good/decent success?).

Logbook Updates

A **consistent** effort is required to successfully complete a capstone project. Therefore, to encourage ongoing progress throughout the semester, students are required to attend and contribute to **a professional status update** meeting each week. A sample agenda may be:

- Time spent on project (outside class and not counting writing reports and logbook updates)
- Detailed description of work completed (e.g., research of a specific problem, design of a system or module, specific implementation)
- Challenges encountered (problems that student came across and which have or have not been resolved yet)
- One-week outlook (brief statement summarizing work to be done)

You will record the result of this status meeting in a logbook.

The logbook will be checked and graded (Satisfactory, Unsatisfactory) by the course instructor. Any status meeting rated "unsatisfactory" will result in the project being on the chopping block by management—on probation. A second continuous unsatisfactory meeting will result in the project being chopped and a failing grade for the course. However, a satisfactory meeting the following week will remove the project from the chopping block, and the student will no longer be on probation.

(As a guideline, a minimum of three work hours per week per registered credit hour is required to receive a satisfactory rating for a Logbook Update. However, it should be noted that the three hours are only a technical minimum. They do not guarantee a successful project or a good grade in this course. *Students should expect to spend a lot more time on their capstone project.*

Final Presentation

The final report will be due the last day of class, and will also contain documentation for your project, a conclusion (lessons learned, and description of the work completed), bibliography, and acknowledgements of any contributions of others.

The PCSE Senior Theses presentations are scheduled twice a year on the last Friday before final exams. If you have completed your work and wish to be scheduled for a presentation, you must contact the instructor at least two weeks in advance of the presentation date. It is suggested that you rehearse your presentation prior to the formal presentation day. Presentation attire for the presenter is business attire.

Software Fair

In the Spring Semester, computer science students instead participate in a group software fair, held on grounds at Christopher Newport University. Faculty, students, and alumni will be present (as many as 100+) to rate your projects and help determine your grade. Each student group will be allotted a demo area (booth space) and will be required to staff their booth for the fair, answering questions (some very tough!) that the audience might have. Buffet lunch and music is usually provided by the department.

Other Deliverables

In addition to the aforementioned submissions, following items have to be delivered at the end of the project:

- A CD containing electronic copies of all documentation produced during the project, in Microsoft Word or PDF format.
- Any software / hardware artifacts resulting from the work.

Grading

Standard university scale will be used for +/- grading. In addition to the PASS/FAIL component of the log book, your grade will be based on the documentation and other deliverables. Individual grades may be adjusted up or down from the group grade at the discretion of the professor, based on the student's contribution or lack thereof.

65%   Software Project

20%   Documentation (10% proposal docs, 10% system docs)

10%   Final Presentation

5%   Logbook updates

Late Work

Except for cases of demonstrable extenuating circumstances, an assigned work grade will be linearly depreciated to zero over a period of seven (7) days from its due date.

Academic Success

The Center for Academic Success offers free tutoring assistance for CNU students in math, science, and languages, as well as other subjects. The center also offers individual assistance and/or workshops on various study strategies that can assist you at performing your best in your courses. The center also houses the Alice F. Randall Writing Center. Writing consultants can help you at any stage of the writing process, from invention, to development of ideas, to polishing a final draft. The Center is not a proofreading service, but consultants can help you to recognize and find grammar and punctuation errors in your work as well as provide assistance with global tasks. Go as early in the writing process as you can, and go often!

You may drop by the Center for Academic Success to request a tutor, meet with a writing consultant, pick up a schedule of workshops, or make an appointment to talk one-on-one with a University Fellow for Student Success. The Center is located in the Trible Library, second floor, room 240.

Disabilities

In order for a student to receive an accommodation for a disability, that disability must be on record in the Dean of Students' Office, 3rd Floor, David Student Union (DSU). If you believe that you have a disability, please contact Dr. Kevin Hughes, Dean of Students (594-7160) to discuss your needs. Dean Hughes will provide you with the necessary documentation to give to your professors.

Students with documented disabilities are required to notify the instructor no later than the first day on which they require an accommodation (the first day of class is recommended), in private, if accommodation is needed. The instructor will provide students with disabilities with all reasonable accommodations, but students are not exempted from fulfilling the normal requirements of the course. Work completed before the student notifies the instructor of his/her disability may be counted toward the final grade at the sole discretion of the instructor.