

Michael Brown

Capstone Project Guide

SWEN 670
Software Engineering Specialization
Information Technology Master's
The Graduate School
University of Maryland Global Campus

Last Updated 3/24/2020

<u>WELCOME</u>	<u>3</u>
<u>INTRODUCTION</u>	<u>3</u>
COURSE DESCRIPTION	3
<u>ORGANIZATION</u>	<u>3</u>
<u>DELIVERABLES</u>	<u>3</u>
<u>ROLES</u>	<u>4</u>
STUDENT	4
FACULTY MEMBER	4
CUSTOMER	4
<u>GRADING</u>	<u>4</u>
GROUP GRADE	4
PEER GRADE	5
INDIVIDUAL GRADE	5
GRADING RUBRIC	5
<u>QUESTIONS AND ANSWERS</u>	<u>6</u>

Welcome

Welcome to SWEN 670 the Software Engineering Project or often called the CapStone Project. For most of you this is the end of your Master's degree. It has been a long journey and you probably learned a lot. This final project of your degree will demonstrate that you can put together all that you have learned to produce professional level work.

The Capstone Project is like no other course that you have taken at UMGC. There is no textbook, no group discussion and no materials. The Capstone Project is designed to measure what you have learned throughout the Master's degree. You should already have the skills, knowledge and experience to complete the project, however, many students find that they learn a lot during the project.

Introduction

Course Description

A comprehensive examination of the tools, skills, and techniques of software engineering and their application. Completion of a major team project is designed to integrate knowledge and skills gained through previous study and provide experience of the constraints commonly experienced in industry (scheduling, vagueness of clients). Project requires forming teams (organization) and scheduling work to meet the deadlines imposed by the contract (syllabus).

Organization

Due to the size and complexity of the projects students are broken into teams. Each team is provided with a high-level project description and point of contact information for the customer.

It is completely up to you how you will self-organize your group. Not every group organizes themselves in the same way. The subject matter, personal strengths (and weaknesses) and timeframe normally play a part into group organization.

Deliverables

All projects have milestones. They help measure the progress of a project. In the Capstone Project there are four milestones. The first one is very well defined. The other three are not. In the first milestone your team will develop a Project Plan (sometimes called a Project Management Plan). That plan will explain how the team will accomplish its goal and will describe what the other three milestones are. Projects are not restricted to any single software development method, design conventions or documentation style (or format). Those are all up to the group.

Each milestone will have deliverables. The only required deliverable is a Project Plan for Milestone 1. This Project Plan should identify all other deliverables. The Project plan should be specific about exactly what artifacts or documents will be delivered for each milestone.

Each milestone has a deadline. A team may turn in their deliverables in early. Points will be deducted for turning them in late.

If you believe that a customer should “sign off” on a document, you don’t need to manually have them sign it. You may just get an email from them stating that the document ABC has been reviewed and they accept it as correct. You can copy this email into the signature part of the document or submit it as a separate file. If you do not do this, it will be assumed that the customer has not signed off on it. That is not to say that customers should or need to sign off on all documents.

Roles

Student

Students need to complete the project. In doing so you should address all areas of software engineering. For example, perfect code that has never been tested as little value.

On some occasions groups cannot function correctly. There could be personality issues or very strong disagreements. In cases like this, were the team cannot function, get the faculty member involved.

Faculty Member

The faculty member is not here to manage the project or tell you how to complete it. The faculty can and will give advice. This is done through feedback on project milestones and upon request. Don’t be afraid to ask the faculty member for advice. Likewise, don’t spend too much time trying to guess what the faculty member is looking for. You should have the skills and knowledge to complete this project.

Customer

The customer ultimately receives all of the artifacts from the project. But customer satisfaction does not necessarily result in a high grade. Likewise, customer dissatisfaction does not necessarily result in a low grade. Many customers do not fully understand technology and cannot make an honest determination of the quality of the work.

Customers are there to provide you with the information that you need to complete the project. Students need to make sure that they ask the right questions and keep the lines of communication open.

Grading

Group Grade

For each of the four Milestones the faculty member will assign a grade based upon the quality of the work that has been presented in that Milestone. This part of the grade will be the same for each member of the group. Each grade will represent 15% of your total grade for each Milestone for a total of 60% of your final grade.

Peer Grade

Each member of the team will grade each other based upon their contribution and level of effort. This will happen once for each Milestone. Each student will be given an individual grade for each Milestone that will represent 5% of his or her total. This makes 20% of a student's final grade coming from individual grades.

When grading your fellow group members please be objective. Determine a grade from 0 to 100 that represents his or her contribution. The normal grading scale applies: 100-90 A; 89-80 B; etc. Try not to give everyone in your group 100.

Individual Grade

You will receive a grade from the faculty member based upon your contribution to the team. You will be asked to create a short document outlining your contribution to the team. You should begin by taking a Word document and put your name and the Milestone at the top. You cannot write long paragraphs about your work. Each task that you accomplished should be in a single sentence and you should number each sentence. Each sentence should start with "I" followed by a verb and then a direct object. Here are some examples:

1. I wrote section 4 of the requirements document version 1.
2. I reviewed the test suite.
3. I coded the check reconciliation module.

You must submit this document in the assignment area for the appropriate Milestone Individual area. You must also put the document in your team's group locker.

Grading Rubric

Grading for a CapStone Project is much more complex than other grading in school. Ultimately you are graded on how well you complete the project. It is nearly impossible to describe all of the ways that projects of this complexity could have mistakes. Simply having working code at the end is not enough to conclude success.

Here are some of the areas that are looked at:

1. Clarity – This applies to all areas of the project from design, development, testing, etc.
2. Technically Sound – This part of the grading looks out how sound your solutions to various problems are.
3. Meeting Milestones – This measures if you meet your milestones.
4. Communication – This applies to all lines of communication, including to the customer, other students and the faculty.
5. Quality – This applies to all areas of your project, not just the software.
6. Adaptability – Part of the grading looks at how adaptable your solution is and measures how well this software will be used. This measurement can vary depending upon your specific project.
7. Professionalism – This measures how these artifacts would be received in industry.

Here are some areas that are not part of your grade:

1. The software methodology that you use. There might be some exceptions to this statement. For example, if your customer doesn't know exactly what he or she wants and you pick the WaterFall method that is obviously a bad choice.
2. Document formats. Look at what the goal of the document is and meet that goal. I will not deduct points because you used IEEE SRS instead of Use Cases. However, it is recommended that you pick a format for documents that have standards created for them.

We are very selective on who is allowed to teach the CapStone course, more so than other courses. All CapStone faculty have a Ph.D. and at least 15 years of experience in industry.

Questions and Answers

Q: What software development method should we use?

A: This course is completely software development method agnostic. You can use whatever method you would like to. What is important is that you pick a method, document how you are going to use it and follow it.

Q: Does it matter what document formats or styles we use?

A: No. For example, it doesn't matter if you Use Cases or IEEE SRS to document requirements. What does matter is if the requirements are clear and unambiguous.

Q: We did really good work, why didn't we get an A?

A: At this point in the program you should be able to do professional level work. An A is reserved for truly exceptional and insightful work. The grade of B is reserved for solid graduate level work.

Q: Should I assume that the faculty member is an expert in the methodology and document formats that we have selected?

A: We try to pick faculty to teach the CapStone with the most experience in industry. However, it is impossible to anyone to be an expert in all forms of methods and formats. It is suggested that you write your documents with this in mind. Include a part of the document briefly explaining the format.

Q: Should I try to find out what methods and document formats the faculty knows best and just use them?

A: No, use the method and document formats that you think are the best for your project. Many experts in areas know the limitations of those areas. You might have a faculty member that is an expert in the WaterFall method, but if your customer doesn't have a firm grip on the requirements even a WaterFall expert would say that is not a good choice.

Q: What should we do if something goes wrong on the project?

A: Software projects often have issues. A successful Capstone team is judged on how they handle problems, not necessarily if problems occur. Ignoring problems do not help. Falling behind on a project and not notifying clients of this doesn't help either. The best way to handle programs is to show that you know how to identify problems during a project. And show that you can take steps to address problems.

Q: Can my team incorporate other software into our project like open source software?

If you plan to incorporate other software into your project, you should check with your customer. Some customers plan on using the software and don't really care if anyone else uses it or what it is made of. Some customers plan to package and sell the software. In these case if you incorporate other software, the customer might run into licensing issues. So, you should really check with your customer.

Q: If I receive a bad peer review should I tell the professor that I am not a professional developer, so I can't do anything?

No, that is a horrible thing to say. After completing this program you should be able to create a professional project plan, requirements document, design document, code, test plan, test suite and user interface design. If you cannot make a substantial contribution to your team you should not graduate.

Q: Does my customer have access to the online classroom software?

No, for many reasons customers do not have access to the online classroom software. If there is a document that needs to be reviewed by the customer, you'll need to send it to them.