

KSU IT4983 Capstone Project Guide

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General Information

IT 4983 capstone projects give students a chance to apply their knowledge and skills in a real world IT project in teams. It is a required concluding course of the BSIT degree program. Visit <http://itcapstone.blogspot.com> for a list of all projects and project resources.

General project features

- ❖ Involve IT related design, development, implementation, analysis and research.
- ❖ Have real world contexts, requirements, communications, and challenges.
- ❖ Are scoped to be finished in about 3 months, by a team of 3 to 5 people (with at least 120 hours of total project time per person).
- ❖ Include both technical and soft skill components (such as collaboration, communication, planning, research, problem definition, project management, writing, documentation, presentation, virtual collaboration, etc.).
- ❖ Require students to learn and practice new knowledge and skills.

Project preparation

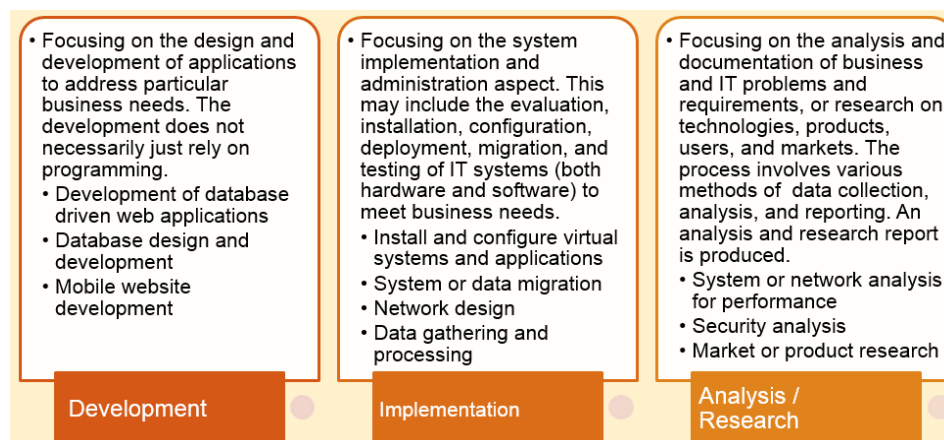
Normally the instructor gets in touch with different clients (private, company, non-profit, government, faculty, etc.) and prepares all projects. Students will be assigned to a group and project based on their preferences. Students may also propose a project but it needs approval before the semester. Students may propose two types of projects (in either case, a team needs to be formed):

1. If you know someone (for example your employer or manager) who wants to do some IT projects but has resource constraints, and he/she is willing to work with our students. In this case, he/she will be your project client/owner and will set expectations.
2. If you have some great ideas of your own and want to investigate or build a solution or product. In this case, you set the expectations yourself (approved by the instructor) and work the project for yourself. The evaluation process will be a bit different - we will use an expert review rather than project owner review.

A project charter of each project will be posted. This document briefly describes the basic project background, major work and expected outcomes, skills/knowledge involved, recommended team size, project owner information, and references. These documents will be available in the first week of the semester.

Basic project types

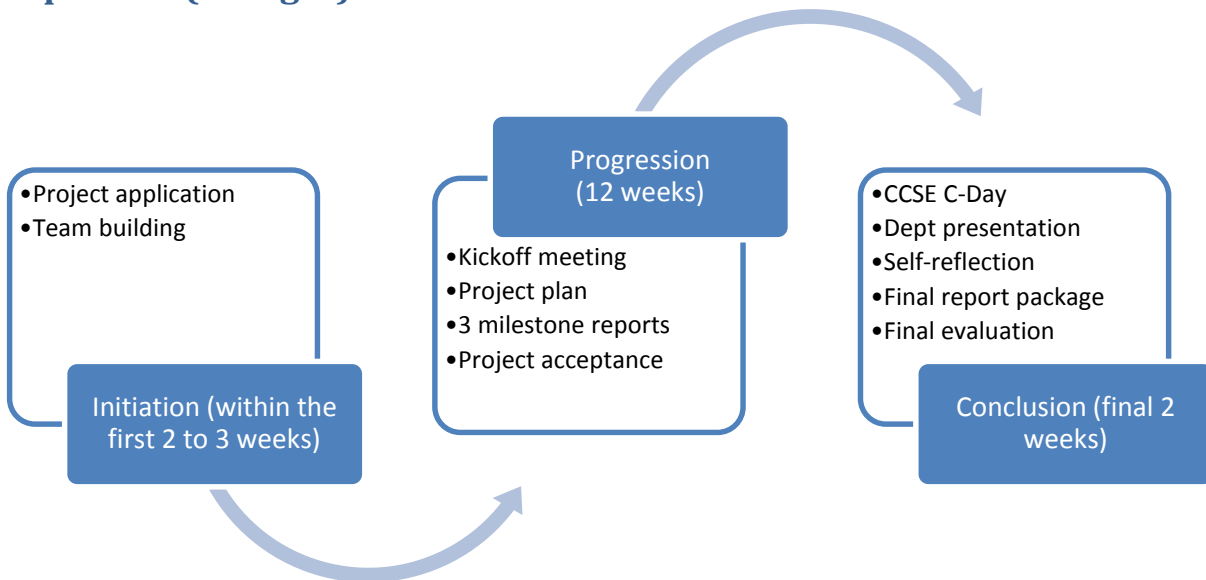
Please visit <http://www.slideshare.net/jgzheng/it4983-capstonereport2012> for examples.



Major project stakeholders and responsibilities

Stakeholder	Roles/Expectations
Instructor	<ul style="list-style-type: none">• Acts as a meta-project or program coordinator. Prepare, coordinate, and manage all projects at the high level.• Help to determine project scope and goals.• Assist teams on project planning and milestone reporting.• Advise teams on project management, team communication, collaboration, presentation and poster preparation.• Evaluate and provide feedback to teams on project progress, team performance, and all kinds of reports including planning, milestones, and final report package.• Coordinate between different stakeholders, including students, clients, faculty, staff, etc.• Provide technical consultancy as requested to a certain level.• Provide other administrative assistance.
Students	<ul style="list-style-type: none">• Work together as a team to complete the assigned project.• Commit to the project and the team.• Embrace challenges and try to work out solutions independently.• Actively participate in the team meetings and other activities.• Be flexible and attend required class and group meetings.• Be proactive and active; communicate with the project owner and the instructor regularly; respond to emails promptly.• Complete milestones and reports on time. Complete assigned task on time.• Check D2L regularly for important announcements, discussions, and assignments. Submit work on time according to the course schedule or other specific requirements.• Learn new IT knowledge and skills.• Be objective and honest when doing peer evaluations.
Client (Project owner/sponsor)	<ul style="list-style-type: none">• Provide clear and detailed project goals and expectations.• Keep communication open and give prompt feedback to students.• Keep the project on track and in scope but maintain appropriate workload and difficulty level.• Provide resource and technical assistance if possible but not required.• Mentor students if needed to help them achieve better results.• Communicate with the instructor on team performance, project feedback, potential issues, and any possible change.• Assess project and team performance and complete the evaluation form on time.

Project process (3 stages)



Project Initiation

Project application/recruitment

A list of project charters will be posted before the first class meeting.

Project owners are invited to the first class meeting to share more details and answer questions. Students can consult with the instructor or project owner for more detailed information.

The assignment process simulates an internal recruiting process commonly adopted in many project-based consulting companies. Students will apply to projects by submitting a brief resume and responding to a questionnaire about their background, skills, learning expectations, preference of projects and team members, meeting availability, etc. This should be completed as soon as possible within one week. Prompt response will facilitate the recruitment process.

The instructor (and project owners if necessary) will assign teams and projects based on a combination of questionnaire results, project needs, project owner needs, and other factors.

Team building

Generally, each team consists of 3 to 5 people. Each team should have the following roles. Roles are not exclusive to each other. Any person can take on multiple roles. The assignment depends on your team size, skill sets, communication styles, and each person's expectations.

Role	Responsibilities
Team manager/lead (one person required)	<ul style="list-style-type: none">• Acts as the leader and manager of the team.• Needs strong leadership and project management skills.• Practices project management activities including coordinating team activities, tracking project progress and schedule, keeping meeting minutes and activity logs, compiling and submitting required reports, etc.• Is the dedicated contacting person for the team; make timely communication with the project owner and the instructor.• Arranges all kinds of meetings; participates in all required meetings and ensures everyone is aware of the project status and plans.

Technical specialist (multiple people)	<ul style="list-style-type: none"> • Is the driving force to analyze, design, develop, and implement technical solutions. • Conducts research on concepts, technologies, products, and systems. • Provides materials to the team leader or the technical writer for all reports.
Technical writer (one person recommended)	<ul style="list-style-type: none"> • Prepares required research reports, documentations, manuals, tutorials, references, etc. • Helps to document project-relevant learning, materials, and activities. • Prepares presentation and poster materials.

Project Progression

Kickoff meeting

The kickoff meeting (with the instructor and the project owner) should be scheduled as soon as the team and project is determined. The major purpose of the meeting is to develop a project plan.

Project plan

The project plan is a very important document to define project objectives, milestones, final deliverables, collaboration plans, and schedules. A template will be provided to guide the plan development. A draft plan should be completed in the kickoff meeting and finalized (approved) by the fourth week of the semester. The plan should be confirmed and approved by both the project owner and instructor. It may be adjusted later in the semester but should be fully justified and documented. A project information website will be created and all projects will be listed at <http://itcapstone.blogspot.com>.

Milestone reports

The project lasts about 12 weeks. There will be a milestone report about every four weeks. The first two milestones are for progress reporting and the last one is for final project examination and acceptance. The report meeting date/time will be specified in the project plan. The team leader should confirm with everyone at least a week before the meeting date and make changes if necessary. The team will deliver an informal report presentation and demonstration.

The purpose of this report is to summarize project status, check milestone progress, report team activities and achievements, identify changes, and plan for the next phase. Follow the milestone report and presentation guide to develop your report, which includes presentation report, Gantt chart, activity log, and peer evaluations. The instructor and project owner will provide feedback to the draft report and team performance. Submit the report after modification based on feedbacks. Milestone reports should also be reviewed by the project owner.

Mid-term peer evaluation

The team will conduct a preliminary mid-term peer evaluation to review individual performance. Midterm peer evaluations are not graded but as a reference for identifying issues and future improvement. A student who is significantly lack of participation and contribution will have to improve performance or be advised to withdraw.

Last milestone (project acceptance) meeting

This is the end point for all project work. The purpose of this meeting is to review the complete project and all deliverables. All project materials will be transferred to the project owner, whether finished or not. The project owner will sign the project acceptance form and evaluate the team performance after the meeting. The last milestone meeting will be about two weeks before the department presentation.

Project Conclusion

CCSE C-Day

The computing showcase day is a college-wide event with all capstone and research projects demonstrated to the public. Each team will make a poster and present it in the event.

Individual reflection

Each student will respond to a survey with about 10 questions to review his/her own performance.

Department presentation

A formal presentation will be delivered to IT department faculty and Industry Advisory Board (IAB) members at the end of the project. Project owners and other guests are invited to the presentation. The audience will evaluate the project based on posters and presentations.

Final project package submission

All materials (progress reports, source code, documentation, references, tutorials, manuals, final report, survey, peer evaluation, etc.) should be compiled and submitted through D2L. More submission requirements will be provided separately.

Final peer evaluation

Each student receives the average of the peer evaluations of team members. An evaluation form will be used. A student will be considered as significantly lack of contribution if the grade is less than 10 (out of 20), and may potentially fail the course.

Project evaluation

There are 90 points allocated for the project.

- Progress reports: these reports consist of the project plan, milestone reports, and the final comprehensive report. Each report is graded on progress satisfactory, report completeness and quality. All team members get the same grade except for the individual reflection part. More information and templates will be provided.
- Project owner evaluation: a survey will be sent to project owners to evaluate the overall performance at the end. All team members get the same grade.
- Department evaluation: your project will be evaluated by faculty and IAB members based on your presentation and poster. All team members get the same grade.
- Peer evaluation: this is an individual grade for each person based on your team members' evaluation. A student will be considered as significantly lack of contribution if the grade is less than 10, and group grades on other items may not be granted in such cases.

The evaluation breakdown by evaluator and student work is shown in the following evaluation matrix.

Evaluator	Project Plan and Milestones	Final Submission and Report	Individual Reflection	Poster and Presentation	Overall Experience	Total
Client					20	20
Instructor	20 (with client inputs)	10	5*			35
Department				15		15
Teammates					20*	20
Total	30		5	15	40	90

* Note: these are individual grade, while others are group grade.

Capstone Experience and Advice

Selected student advice from past classes

- This class really pushed me to my limits when it comes to learning and working. This class is no joke and should be taken with only one other class not two other classes and two jobs.
- ... stay on top of deadlines and try as hard as possible to be a positive group member.
- First, please ensure that you have taken as many major courses as possible before attempting this course, so that you are as prepared as possible. Second, try not to take more than one other class in the semester that you are taking this course. Third, please make sure to take this course seriously, so that you may take away many lessons and skills to be applied throughout your career.
- First advice would be make sure you communicate with your team. Without talking to each other, everyone is going to be long and you will always be behind in the project. The second advice is make sure you do not wait till last minute to do the assignments. The assignments can look short at first but when you start doing the assignments, they will turn long.
- To maintain a full-time schedule, I wound up taking this Capstone course alongside four other courses. It wasn't problematic at first, but became very hard to manage my time properly among work and assignments as the semester progressed. If possible, it may be better to focus only on the Capstone course in order to ensure that you can contribute properly to your team.

For more information, please read the **capstone experience.pdf** document.

References and resources

- Capstone project website: <http://itcapstone.blogspot.com>
- Capstone report: <http://www.slideshare.net/jgzheng/it4983-capstonereport2012>
- Publication: Zheng, Guangzhi, Zhang, Chi, and Li, Lei, (2015) Practicing and Evaluating Soft Skills in IT Capstone Projects, ACM SIGITE 2015
https://www.researchgate.net/publication/281806496_Practicing_and_Evaluating_Soft_Skills_in_IT_Capstone_Projects

Note: this guide tries to provide as much information as possible. But there are always unexpected issues. Please try to communicate with the instructor if there's any question or concern. Thank you.