**IT 7993 Capstone Project Guide**

**Dr. Meng Han**

# General Information

IT 7993 capstone projects give students a chance to apply their knowledge and skills in a real-world IT project in

teams. It is a required course for the MSIT students in capstone track. Visit capstone project sitefor a list of projects for current semester and from previous semesters.

**Capstone project site**: <https://msit.kennesaw.edu/current-students/capstone.php>.

# 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.

# Basic Project Types

There are generally three types of capstone projects. The project list isn’t exclusive, and a project may include features from multiple types. See capstone project site for examples.

* *Development* – design and development of applications to address particular business needs. This type of project doesn’t necessarily just rely on programming. Examples include data analytics or cyber security applications, database design and development, and web applications etc.
* *Implementation* – system implementation and administration. Such project may include evaluation, installation, configuration, deployment, migration and testing of IT system to meet the business requirement. Examples include install and configure virtual systems, system integration, and network design, etc.
* *Analysis & Research* – analysis business problems and conduct research on technologies, products, users and markets for potential IT solutions. Such project includes research design, data collection, analysis and reporting. Examples include system analysis for performance, security analysis, and market/product research etc.

# Project Preparation

Before each semester starts, 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 an IT project 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 you own and want to investigate or build a solution or product. In this case, you work with instructor to set the project expectations yourself and will act the project lead. The evaluation process will be a bit different - we will use an expert review rather than project owner review.

# Major Project Stakeholders and Responsibilities

|  |  |
| --- | --- |
| **Stakeholder** | **Roles/Expectations** |
| Instructor | * 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 | * 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) | * 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. |

Conclusion (final 2 weeks)

# Project Process Overview

## A screenshot of a cell phone Description automatically generated

# Project Initiation

### Project introduction and application

* *Before first class of the semester* - a list of project information will be posted capstone project site. Students are suggested to read the project information and may consult instructor for details of the project. At the same time, a student should think about who she/he wants to work tighter.
* *First class of the semester* – Project introduction. Project owners are invited to the class meeting to share more details and answer questions. Project owner information won’t be shared until a project is assigned to a student team.
* *By the end of end of first week* – project application. 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. Prompt response will facilitate the assignment process

### Project Assignment & Planning

* *Beginning of second week -*instructor will assign student teams and assig projects to team based on based on a combination of questionnaire results, project needs, project owner needs, and other factors. The assignment process simulates an internal recruiting process commonly adopted in many project-based consulting companies. A student should contact instructor immediately if he/she is NOT okay with the assignment.
* *By the end of second week – team building*. Each student team consists of 3 to 5 members. All members should get together for following tasks: 1) elect a team lead; 2) determine each member’s role in the project which could be based on your team size, skill sets, communication styles, and each person’s expectations; 3) work out a plan how the team is going to work together such as communication plan, collaboration technology and expectations on each members.

|  |  |
| --- | --- |
| ***Role*** | ***Responsibilities*** |
| Team manager/lead  (one person required) | * Acts as the leader and manager of the team. * Submit a weekly update to the project owner and the instructor. * 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) | * Acts as 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) | * 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

# 2.1. Planning

* *Early third week - A kickoff meeting* should be scheduled with project owner and instructor either on late second week or early third week of semester. The main purpose of the meeting is to develop a project plan.
* *End of third week – A project plan should be submitted to the corresponding D2L dropbox.* 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. 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.

# 2.2. Milestone reports

Students are expected to work on the project for the next 12 weeks. There will be a milestone reports approximately every four weeks. The report meeting date/time will be specified in the project plan. The team lead should confirm with everyone at least a week before the meeting date and make changes if necessary. The purpose of milestone 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.

Major work of the project should be completed by milestone 3.

# 2.3. Mid-term peer evaluation

The team will conduct a mid-term peer evaluation to review individual performance which will be served 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.

# 3. Project Conclusion

## In the last two weeks of the semester, student teams should work on conclusion of the project which include following items.

## *CCSE C-Day* -The computing showcase day is a college-wide event with all capstone and research projects demonstrated to the public. Each team is required to make a poster and submit it to the C-day. Selected projects will present at the C-day.

## *Youtube video of the project* - Each team is required to create a two minutes videos of their project. The video will be posted in IT department Youtube channel. Student should start collecting raw material for video such as pictures or short video clips at the beginning of the semester.

## *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. The project team may also present at client’s side upon agreement among project sponsor, student team and the instructor.

## *Individual reflection* -Each student will respond to a survey with about 10 questions to review his/own performance.

## *Final project package submission* - All materials (progress reports, source code, documentation, references, tutorials, manuals, etc.) should be compiled and submitted through D2L.

## *Final peer evaluation* - Each student receives the average of the peer evaluations of team members. 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.

# 4. Project evaluation

There are 95 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.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Evaluator** | **Project Plan & Milestone** | **Final Submission** | **Individual Reflection** | **Poster, video & Presentation** | **Overall experience** | **Total** |
| Client |  |  |  |  | 30 | 30 |
| Instructor | 15 (with client input) | 10 | 5 |  |  | 30 |
| Department |  |  |  | 15 |  | 15 |
| Teammates |  |  |  |  | 20\* | 20 |
| Total | 15 | 10 | 5 | 15 | 50 | 95 |

# Capstone Experience and Advice

## Selected student advice from past classes

* This is definitely a very hard class that should be taken only with 1 more easier class. The skills you will learn (technical/soft skills) will be definitely instrumental for the rest of your professional life. Be patient and get to learn from your mistakes.
* My advice is to work hard and do what you are tasked to do, but just don't stop there; be a strong team player and do whatever needs to be done!! This is a great experience and try to learn as much as possible and go beyond.
* Make sure your team communicates well, stays on schedule, and hold each other (and themselves) accountable.
* The skills you will learn (technical/soft skills) will be definitely instrumental for the rest of your professional life. Be patient and get to learn from your mistakes.
* The most important thing to pay attention to is time management and setting expectations for teammates very early in the semester. This is especially important for the team leads who are responsible for making sure the project is staying on track.

# Professionalism

Students are expected to act professionally in their capstone projects.

* Professionalism means dress in the proper attire, be reliable and dependable, be a great character, follow netiquette when communicate with others, etc. Check out the 20 tips on acting like a professional in the workplace: <https://www.decadirect.org/2016/03/09/20-tips-to-help-you-act-like-a-professional-in-the-workplace/>.
* Always show respect to the project owners no matter they are from external organization or from our department. The project owners volunteer their time to supervise your project. Make sure that you appreciate their time and dedication.
* When you work in a capstone project with an external project owner, you not only represent yourself, but also represent your team, the MSIT program, and IT department. Show your best behavior and make yourself and your instructor proud. It takes a lot of efforts to secure a capstone project from external companies/organizations. The better you perform in those projects (professionalism is a big part of it), the more opportunities for yourself and future students.
* External project owner often uses the capstone projects to observe a student’s technical capability, work ethics, communication skills, and other attributes. Those observations will become a very important factor when project owner’s company decides to hire or be turned into a strong recommendation letter if the student is seeking other job opportunity. In another words, take advantage of having an external project owner and treat the opportunity as an internship or a pathway to a job offer.

# References and resources

* Capstone project website: <https://msit.kennesaw.edu/current-students/capstone.php>
* Publication: Zheng, G., Zhang, C., and Li, L. (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\_Capston](https://www.researchgate.net/publication/281806496_Practicing_and_Evaluating_Soft_Skills_in_IT_Capstone_Projects) [e\_Projects](https://www.researchgate.net/publication/281806496_Practicing_and_Evaluating_Soft_Skills_in_IT_Capstone_Projects)