Capstone or Thesis

The Master's capstone or thesis project forms the culmination of the MS program in Software Engineering. It is a large body of work, which you undertake independently, but under the supervision of a full-time SE faculty member.

A **capstone project** consists of a nontrivial software development effort and a report discussing it; or it is a report dealing with more theoretical questions. Original insight into a problem is desirable but not required. The project report is expected to be a scientific paper:

- describing background and relevant results in the area
- detailing the work carried out
- discussing the significance of the deliverables of the endeavor and providing appropriate reference citations

The project report is to be submitted in electronic format (see the Deliverables section).

A **thesis** should deal with a significant question and involve some original insight. Compared to a capstone project, a thesis has a much higher level of expectation in terms of background research and justification. A thesis should also result in a paper submitted to a conference, a journal or other forms of public dissemination. Upon acceptance of the proposal by the committee, the effort required is that of a single six-credit course.

More specifically, the difference between a project and thesis is the technical depth of the work involved. Capstone projects and thesis both often have a computer programming aspect and research component. The requirements for a capstone project are less stringent than for the thesis. The thesis requires more depth and the student should develop a substantial understanding of the topic through library journal research, experimentation, etc. The thesis report will be bound and reside in the Software Engineering Department's PhD room.

The project, after it is well-defined, the pre-proposal has been presented at SWEN 640 Research Methods course, and has been accepted by the student's committee, should take about as much effort as that devoted to a single six-credit course. The final report must be submitted to the department (see the

Deliverables section).

The purpose of a Master's capstone or thesis is to be of educational value to the student and to independently create and present a large, interesting piece of work. Any acts of plagiarism or other acts of academic dishonesty will result in an automatic 'F' for the capstone/thesis. If you have any questions regarding plagiarism, you should contact your committee chair before you complete your write up or make your presentation. Additionally, by forming your committee and registering for capstone project or thesis you have effectively created a contract between your faculty advisor and yourself. Your committee chair will contribute a substantial amount of time guiding project activities. Failure to complete your capstone or thesis within the agreed upon schedule may result in receiving a grade of 'F.'

In either case, you will need to write a new Proposal, form a new committee, and register for capstone project or thesis again. In both cases the 'F' will remain on your transcript. Additionally, by signing your proposal the committee members agree to serve on your committee for one year. After one year they can resign from the committee if they feel the student is not making adequate progress.

Your Committee

Your capstone project/thesis committee is composed of at least two members:

- SE faculty sponsor
- SE Graduate Program Director
- Observer (optional)

The function of the faculty sponsor is to direct the technical aspects of your project and to ensure that your capstone or thesis meets the department's technical and administrative requirements. The faculty sponsor has to be a member of the SE faculty.

Other faculty members may also review your work and make recommendations to your faculty sponsor. All advisement will come directly from your faculty sponsor. The faculty sponsor and Graduate Program Director must sign off on your Proposal before you are registered for

capstone project or thesis. A possible third member of your committee, the observer, will attend your defense and ensure that department guidelines are met. It is most important that you establish a committee before you begin serious work on your project. Failure to do so may cause significant delay in the completion of your degree.

MS Capstone/Thesis Seminar Registration

As students prepare to begin their project or thesis, they must register for 3 credits of SWEN 640 Research Methods. During the semester, you must develop your pre-proposal in the course and form your committee.

Outcomes of MS Capstone/Thesis Seminar

Each student takes SWEN 640 Research Methods. The student will find a faculty sponsor and a capstone project/thesis topic during this course.

- The student writes a pre-proposal.

- The student submits the pre-proposal to the faculty chairperson and course instructor.

- The pre-proposal gets accepted or sent back to the student for modifications.

- The student writes the proposal, after the pre-proposal gets accepted.

- The proposal gets accepted or sent back for modifications.

- The student sets up a website, after the proposal gets accepted.

- The student corresponds with the faculty chairperson on a regular basis.

- The student updates their website at least every two weeks.

- The student writes the final report/thesis.

- The student defends the capstone project/thesis, after the final report is accepted.

MS Capstone/Thesis Proposal

The proposal should contain the following sections:

- A summary describing what you will do.

- An overview of the area of your capstone project/thesis.

- A hypothesis.

- How the proposed work will be evaluated against existing work.

- Detailed overview of the planned system or problem being investigated; e.g., the design specification. This may be less well-understood, hence somewhat shorter.

- A list of the principal deliverables of your capstone project/thesis and the form that these will be delivered, such as: technical paper or report, input/output examples or demonstration, code (the complete system should be given to your committee chair archived on a single file, user manual, with relevant artifacts (e.g. design documentation and maintenance manual).

MS Capstone Project or Thesis Registration for Credit

To register for capstone project or thesis, your proposal must be signed by the Graduate Program Director, the faculty sponsor, and the student. The form can be found on the SE website. If you do not finish your capstone project or thesis in the first semester in which you register for credit, you will receive a grade of 'I.' You should continually share monthly progress reports with your faculty sponsor, as well as request to register for a continuation of capstone or thesis for all subsequent semesters until completion.

Doing a MS Capstone Project/Thesis Related to Your Work

A student may be working in the computing field, and find that their work provides them with an opportunity to do projects that are comparable to the MS capstone project or thesis, and they would like that work to qualify. This approach is possible, and there is some precedent for doing it. The work that will be submitted as the capstone project or thesis must be monitored by the faculty members on the committee and the student must share their progress monthly.

Because an SE faculty member is monitoring your work, this rules out submitting a proposal for work that has already been completed. In addition, the report, and a significant portion of the other work products such as code, must be made available for other students to read in the future. The committee sets the requirements - not the employer. It is your responsibility to ensure that your employer's requirements for confidentiality are respected.

Checklist for the Thesis Defense

The last step in the thesis process is the defense. After the student has completed the write up of his/her work and the chair and the reader have approved it, the student defends his/her work during a 50-minute presentation. The defense is open to the public.

The student is required to follow the procedures outlined below:
- Work with the SE Main Office to schedule the defense. You must find a few days and times when all committee members are able to attend. The SE Main Office support staff will reserve a room.

- Assure that the room has all the facilities you require (board, markers, projectors, ethernet connection, etc).

- Prepare an email announcement to the SE Office support staff at least ten days prior to the event with the following information:

    o   Thesis Title:

    o   Author

    o   Defense Date and Time

- o Faculty sponsor

- o Location

- o Abstract

- o Committee Information (Names of Chair, Reader, Observer)

- o Report URL

- Verify with the department staff that all necessary paperwork has been completed (including application for graduation).

- Review your presentation with at least one of your committee members (typically the committee chair) before presenting it formally. The defense should take 50 minutes, but you must allow time for questions and discussion. When you rehearse, it should take 40 minutes.

- A rehearsal is highly recommended. Ask a friend or two or a member of your committee to sit through a complete presentation. This is the only way you will know how long it takes and to locate the bugs (demos that fail, typos, faulty visuals, etc.) in your presentation.

- Prepare handouts for your presentation consisting of copies of your visuals in 4-up or 6-up form. Discuss with your committee chair how many copies to prepare.

Deliverables

For both Capstone Projects and Thesis:

- Report in PDF: The filename has to be report.pdf, sent to your faculty sponsor and the Graduate Program Director
- Signed cover page

For Capstone:

- Prepare a poster
- Participate in capstone poster day at the end of the semester

For Thesis:

Please see https://infoguides.rit.edu/thesis-services for additional information. The following is required:

- Submit the thesis PDF to ProQuest for publication
- Submit a seperate PDF of your thesis signature page to ProQuest
- Turn in thesis submission receipt to the SE department (via email)