

SEATTLE UNIVERSITY

Master of Science in Computer Science Program

MSCS Research Project Guidebook for Faculty and Students

# Introduction

Students in the Master of Science in Computer Science (MSCS) program are required to complete 8 credits in a graduate project as part of the degree requirements. They have two options to satisfy the requirement: either a research project or a course-only option. For a research project, students must identify a project advisor who is willing to supervise their projects (based on the professor’s expertise, area of interests and the student’s academic performance).

Students who have completed all the core courses are eligible to start graduate projects. The graduate research project spans 2-3 quarters and requires 8 credits. The work expectations are that students work three hours per credit per week (for instance, 15 hours per week are expected for a 5 credit quarter).

# Project Selection and Approval Process

The process for selecting a project occurs in the ***quarter prior to the start of the project***.

1. Talk to the members of the faculty about their research interests and possible project topics.

2. Submit an MSCS Graduate Research Project Request Form that describes what projects you are interested in and the faculty member(s) you might be interested in working with. Deadlines:

* Projects starting in Fall / Summer\* **May 15th**
* Projects starting in Winter **November 1st**
* Projects starting in Spring **Februrary 15th**

\**Projects may start or continue over the Summer quarter only depending on availability of faculty members during that period.*

3. Shortly after the deadline, you will be paired up with an advisor. Once you have been paired up with an advisor, the advisor will schedule a meeting with you to decide on a specific project, discuss computing resources, and set up a weekly meeting time.

# Graduate Research Project

A graduate research project aims to conduct in-depth studies on a topic that falls into one’s area of interests. It results in a technical report suitable for publication and provides excellent preparation for research careers or further education in a doctoral program. A graduate research project might involve implementation components as part of its evaluation. Examples of a graduate research project may include framework development, measurements and analysis, modeling, prototypes of new systems, etc.

## Literature Review

The published literature on the selected topic is reviewed thoroughly. The purpose of the literature review is to learn more about the selected topic, narrow the scope of the study/investigation, and provide inspiration for possible solutions / ideas that can be investigated in the proposed research.

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## Research Proposal

The student must submit a research proposal within the first five weeks of the first quarter (see deadlines section).

* Fall: **October 25th**
* Winter: **February 10th**
* Spring: **April 30th**

The project advisor will review the proposal to ensure appropriate scope and rigor. It should include:

* **Problem Statement**. What problems is your research addressing? Why is the problem interesting?
* **Related Work**. Paraphrase what you have discovered in your literature review.
* **Justification.** Briefly justify the project idea. What is new? How is your idea different/better than others’? Or how does this study/investigation contribute to the existing body of knowledge?
* **Evaluation**. How are you going to test/evaluate your idea? Describe any software you may need to build. List resources you may need to carry out the project.
* **Research Plan**. List all tasks and milestones, and prepare an activities schedule for completion of the project.
* **References**. A comprehensive list of references (IEEE format) properly cited in the document.

## Project Progress and Expectations

Students are expected to meet with their advisors on a weekly basis. Students are expected to work three hours per credit per week. Sustained progress is expected throughout the duration of the project; students are expected to carry out research activities as defined in the proposal. At the end of each quarter (except the last quarter), the student must submit a formal progress report to the project advisor.

## Final Deliverables

Each of the project deliverables should be listed on the schedule. The deliverables will include:

* A technical report with the following sections:
  + **Abstract.** Briefly describe your project’s goals, methodologies, and contributions.
  + **Introduction.** Describe context of your project, project goals and contributions.
  + **Related work.** Discuss existing work relevant to your project and what distinguishes your project from existing work.
  + **Description of Research.** Describemodels and assumptions (if any).Detail project goals and design of your project. How does the design fulfill the goals?
  + **Evaluation / Results.** Describe evaluation methodology and present results and analyses.
  + **Conclusions.** What lessons are learned and what goals are achieved in the project.
  + **Future Work.** How can the work be extended in next step? What issues are remaining open?
  + **References.** Provide a comprehensive list of references (IEEE format) properly cited in the document.
* Other research deliverables: source code, data, etc.
* Final presentation

## Grading

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| **Component** | **Criteria** | **Percentage (%)** |
| Project proposal | Is it well written?  Is it structured as specified in the guidelines?  Does it clearly state the problems to address and/or the applications to design?  Are project goals and schedules feasible?  Does the proposal review related work thoroughly?  What distinguishes the proposed work from related work? | 15 |
| Progress report | Does the project progress meet expectations? | 5 |
| Research work | What makes the research work different from existing work?  What contributions does this work make?  Does it meet the goals?  Are the outcomes significant? | 35 |
| Technical report | Is it well written?  Is it structured as specified in the guidelines? | 20 |
| Final presentation | Do you clearly convey what you did?  Do you stay within time limits?  Do you actually answer the question? | 15 |
| Professionalism | Do you commit your time and meet deadlines? | 10 |