

# Course Research Project

## CS5352: Advanced Operating Systems Design Spring 2021

*Please note that this course research project is mandatory for CS5352 section students, optional but encouraged for CS4352/CS5303 students (you will have an opportunity to work with mentors to learn beyond classroom and to publish papers and software).*

**Topic selection and 1-page proposal due by 3/30.** Please note that you need to approach the mentor and have his/her approval first, before selecting the topic via the Doodle poll below. Once you have the mentor's approval, topic selection is based on FCFS. One-page proposal submitted via Blackboard by 3/30. The proposal will not be graded, and only final deliverables will be graded. For **CS4352/CS5303 students**: if you would like to participate in this optional project, you can reach out to mentors directly for the possibility to work with the mentor and CS4352/CS5303 students don't need to fill out the Doodle poll below.

<https://doodle.com/poll/i8mb3stztfps3bgw>

**Final deliverables due: May 8th, 11:59 p.m., via Blackboard.**

This course project is an open, research-oriented project. It asks you to select one of provided topics, and conduct research investigation of your selected topic. The purpose of this course project is to assist you further understand the principles and paradigms of operating systems and advanced subjects, equip you the ability of learning beyond the classroom and becoming a lifelong learner, and develop in-depth understanding of the latest advancement in the area of your selection. The course project requires you write a formal technical report to summarize your findings and make a formal presentation to report your results. This is an **individual project**, not a team project.

**The required 1-page proposal should include:**

- Topic of your selection with the mentor's approval
- Problem statement
- Research and development activities you plan to conduct

Please note the proposal will **not** be graded and only final deliverables will be graded.

**The required final deliverables of the course project include:**

- A technical report, 3,000 – 4,000 words excluding references, that summarizes your research findings for the topic you focus on studying
  - Try to follow scientific publications format: abstract/introduction/related work/your findings/experiments if any/conclusion
- ~20 min presentation covering your primary research and development findings
- Source codes, charts, figures, etc., related with your research and development process

- All files need to be in the source format (such as .tex/.doc/.pptx instead of .pdf), and submit a tarball of all files

**Grading policy:** Grading is based on three criteria:

- The novelty of your findings, including any problem identified, any solution designed, and any evaluation conducted
- The quality of your report and presentation
- The level of effort

**Deadlines:**

- **Topic selection by 3/30** via Doodle poll below (again you need to approach the mentor and have his/her approval first, before selecting the topic based on FCFS):  
<https://doodle.com/poll/i8mb3stztfps3bgw>  
**One-page proposal due by 3/30** and please submit via Blackboard.
- Full deliverables due: **May 8th, 11:59 p.m.**
- Presentations will be scheduled later.

**Course project topics:**

The following project topics are available for selection (details can be found from the Blackboard), and mentoring help is also available for each topic. However, the mentor is supposed to help you get started and provide guidance during your research process, not meant to conduct the research and development for you. Note that **each topic allows either one student only or two students to take**.

Topics include:

1. Affix-based Metadata Search for Self-describing Data Formats (Mentor: Mr. Wei Zhang)
2. I/O monitoring system for HPC datacenters (Mentor: Mr. Misha Ahmadian)
3. Job Accounting Data Analysis for the QuanaH Cluster (Mentor: Mr. Jie Li)
4. Clustering Job Accounting Data (Mentor: Mr. Jie Li)
5. Identification of Power Consumption Pattern from Performance Counters (Mentor: Mr. Ghazanfar Ali)
6. A Survey on Managing Linked Scientific Datasets (Mentor: Mr. Chenxu Niu)
7. A Survey on Domain-specific Embedding Models (Mentor: Mr. Chenxu Niu)
8. An Auto-Scaling Cluster Using Slurm (Mentor: Ms. Elham Hojati)
9. Checkpointing Technology for Data Centers (Mentor: Ms. Elham Hojati)