MSSI Capstone Project Requirements

Johns Hopkins University Information Security Institute
(Revised in Fall 2019)

General Requirements

Completion of the MSSI program requires a minimum of 10 approved courses of three or more credit hours, or the equivalent, and a capstone project.

The students register for 650.836/837 Information Security Projects in their program of study to prepare for the capstone project. The 650.836/837 Information Security Projects is NOT counted toward the Ten-Course requirement.

Topic and Deliverables

In general, the MSSI Capstone Project should include both technology and non-technology components, and will be conducted within a team-structured environment comprised of up to 3 students and a faculty mentor (plus external mentors if appropriate).

- These projects will generally be sponsored by government/industry partners and affiliates of the Information Security Institute, and can also be related to faculty research programs supported by grants and contracts.
- They should relate to real-world problems in information security and exhibit both theoretical and practical significance.
- The project cannot be just reading and reviewing papers. It should focus on hands on experiences of system development, experimentation, system testing and analysis, etc.
- The project must be documented by a report and presentation, as well as other applicable deliverables including but not limited to system prototype, utility library, experimental demonstration, conference or journal submission, and so on.
- It should follow the best practice of software engineering.

A Few Important Notes:

- These capstone projects must be security-oriented with significant effort to develop insights, findings, techniques and methods that help information security practices. It is important that you project shows and documents such applications and impact.
- You cannot just reuse a previous work, such as a class project, as the capstone. It is fine that the capstone is to be built upon a previous project that you have finished or worked on. However, it should show significant new efforts/findings. The same applies to a capstone project to extend a previously done MSSI project by other students. And you must explicitly document information about its relationship to the old work and the new development of your proposal.
    - *On this policy please review a relevant example given in the school's policy on student misconduct, copied below for your convenience:*
      "REUSE OF ASSIGNMENTS
      • Submission of the same or substantially similar assignment to fulfill the requirements of more than one course."

Project Management and Milestones

Students should actively initiate the project while communicating with (1) the potential faculty mentor for technical topics and (2) the faculty advisor for project management. The project team can also include (3) other student members (no more than three in total as one team) and (4) additional technical mentors from external institutions.

Students are expected to develop a **project plan** at the end of the semester before they start the capstone project. A project **proposal** is expected to be approved at the start of the third semester and the whole project be completed by the end of the third semester. A **mid-project update report** must be submitted in the middle of the semester when the project is planned for completion. A **presentation** will be scheduled when the project concludes together with a **final project report** to be submitted to the faculty mentor, the faculty advisor, and the institute. The faculty mentor should approve each milestone of the project with the faculty advisor being informed. When the project is completed with all the deliverables, the faculty advisor assigns a score upon the recommendation of the faculty mentor.

Note that the above milestones use a common scenario in which a student completes the capstone project in the third semester of the program of study. However, students can choose to start and complete the capstone project in an earlier semester, if so, with these milestones at the corresponding time.

Final Report Organization

The following format is suggested as applicable. In all cases, please type and paginate your report!

(1) Abstract. It comes first in your report, but you write it last.

(2) Introduction. Gives succinct information on the purpose, significance, methods, results and conclusions that will be reported. This serves as an overview about the research topic and the overall project.

(3) Literature Review and Problem Definition. Review important background materials and existing literature, and discuss the problem to tackle, and the scope and limitation of your project.

(4) Technical Solution, Design and Analysis. The section provides your insights and possible solutions about the problem. This includes a comprehensive review, elaboration and analysis on the methodologies and techniques to be used.

(5) Experimentation, Evaluation and Result Analysis. An evaluation plan is the essential part of a technical project. You should have a reasonable and feasible plan. You should include all the essential experimental results and analysis.

(6) Conclusion. You can summarize the contributions of your project and possible future directions on the chosen topic.

(7) References. List of articles and information sources in the order of their appearance in report narrative.

(8) Appendices. This is where you dump all other information related to your project, e.g., codes, raw data, etc.

Plagiarism

Plagiarism is stealing or passing off the ideas or words of another person as one's own - using material without crediting the source. This is prohibited behavior and will not be tolerated. In all your reports and documentation, you should rephrase or paraphrase as appropriate to show and summarize the understanding. NEVER copy and paste without quotation marks and citation. Take time to properly cite material written by someone else - include references, put verbatim quotes in quotation marks. However, you cannot have a report that contains mainly just others' remarks, even if you use quotation marks every time.

Please check the Engineering's "Avoiding Plagiarism" page at our library: https://guides.library.jhu.edu/engineering/citing/plagiarism.

Reference Style

Choose a reference and citation style consistent to that used by **ACM** or **IEEE**. You can check out some detailed examples for IEEE at our library: https://guides.library.jhu.edu/citing/more-styles.

Please pay attention to the following requirements:

- You must number the references according to the order of their appearance in the report text.
- You must use the number of a reference when citing it in the text.

Report Examples

In general, all the papers published by ACM or IEEE conferences and journals can be followed for the organization of your report and the style of citations and references. The following are just a couple examples.

ACM SIGSAC Conference on Computer and Communications Security (ACM CCS):
https://dl.acm.org/citation.cfm?id=3243853

IEEE Transactions on Information Forensics and Security:
https://ieeexplore.ieee.org/document/6117525