

## **Master of Science in Cyber Systems and Operations Thesis Policy**

### **Content and Scope**

The Cyber Academic Group (CAG) recognizes theses as the ideal culminating intellectual product for students earning a Master of Science Degree in Cyber Systems and Operations (CSO). A Master's Thesis for the CSO program must deal with a cyber problem relevant to the Department of Defense of a particular student's sponsoring organization. Students are encouraged to utilize all available resources including high-interest research topics lists (e.g., IDCFE, CRUSER, etc.), faculty interaction, and past experience/contacts when deciding on a thesis topic.

Each thesis must deliver validated results of value in the cyber community. Valuable results can take various forms, including but not limited to one or more of the following:

- Development and validation of models
- Development and validation of cyber applications, architectures, or policies
- Statistical and experimental studies
- Simulation studies
- Solution of a real-world problem

Thesis projects are normally conducted by individual students, however joint theses with no more than two participating students are permitted. The introduction to a joint thesis must state clearly the contribution of each author to the research and to its documentation. Each person must make an identifiable contribution that would qualify as a MS thesis on its own, and the two of them must contribute to a result that one alone could not have made.

Each thesis project will be advised by at least one NPS faculty member with appropriate subject matter expertise and approved by the CAG chair. Additionally, each team will have at least one second reader (or co-advisor) from NPS and optionally a second reader (or co-advisor) from the sponsoring organization. Sponsoring organizations with identified projects are strongly encouraged to provide an actively involved advisor or second reader, or risk diversion of the team to other topics.

Thesis topics will be described in thesis proposals. Each thesis proposal must be approved by all advisors and second readers, the CSO Program Officer, the CSO Academic Associate, and the CAG chair. A thesis proposal will include the following at a minimum:

1. A clear problem description including requirements, objectives, and anticipated results.
2. Advisor and second reader names and organizations.
3. A discussion of relevance and value to the Navy (or sponsoring organization for non-Navy students) and/or Department of Defense.
4. Individual team-member roles and responsibilities for joint theses.
5. A viable product/result test, evaluation, or validation plan.
6. A summary of background research and reading.

7. Anticipated sponsor participation. To the maximum extent possible, this will include the names of sponsor POCs and advisors (and alternates where applicable) and agency directorates and offices that will be providing assistance (including contact information).
8. Final product data management plans (i.e., software archiving, report generation, etc.).
9. Plan of action and milestones (including completion dates).
10. Institutional Review Board (IRB) review checklist.

The thesis process includes a number of milestones and products. The following is a listing of required milestones:

1. Thesis proposal. The thesis proposal will be completed in accordance with the preceding guidance. The thesis proposal is to be completed by the end of quarter three (three quarters prior to graduation).
2. Final presentation. The student will conduct a presentation of their work for advisors, CAG, sponsors, and other interested parties. This presentation will typically be given in a “brownbag” or classroom setting after completion of the thesis project work (the final report does not have to be complete).
3. Final report. The thesis project will be formally documented by a thesis report in accordance with NPS requirements. The thesis report will include a full discussion of the work to include problem statement, background research, method of solution, data or experimental results, findings, and recommendations. In addition, the thesis report will include a thorough discussion of the project’s benefits to the Navy, DoD, or other sponsoring agencies. The thesis report must be completed, signed, and accepted by the NPS Thesis Processing Office prior to graduation.

Sponsors and thesis advisors may determine that additional milestones and deliverables are required for completion of the project.

CSO thesis advisor requirements are as follows:

1. A CSO thesis project will be advised by a committee configured as follows:
  - a. Advisor and co-advisor,
  - b. Advisor and second reader, or
  - c. Two co-advisors

Additional committee members are permitted and will be designated second readers

2. Acceptable thesis committee members will meet the following requirements:

All thesis committee members must hold at least a master’s degree and possess appropriate subject matter expertise for the specific thesis project. In addition, at least one advisor or co-advisor must have an existing association with the NPS CAG.

Any NPS faculty member meeting the above requirements can serve as a thesis project advisor. Any NPS faculty member or sponsoring agency representative meeting the above requirements can serve as a thesis project co-advisor or second reader. A minimum of two thesis committee members must be NPS faculty.

3. The NPS CAG Chair may make exceptions to these policies on a case-by-case basis. Requests for exceptions should be justified in the thesis proposal. Approval of the proposal constitutes approval of the exception.