CMSC 399: Senior Seminar

IMPORTANT SCHEDULING/ACADEMIC CREDIT NOTE: This course has two semesters. Both 399a in the fall and 399b in the spring are now 1.0 credit each, but only the first semester is required. The second semester is optional and counts as a 300-level elective towards the CS major.

399a: Successful completion of the first semester is a requirement for the computer science major. This entails a thorough literature review of a research topic, but does not require original work.

399b: An optional second semester is offered for students who wish to do additional research on their topic, with the goal of making some sort of original contribution.

Instructor: All Computer Science instructors, occasionally others. Schedule: See BiONiC.

Prerequisites: All seniors in good standing who have a declared major in Computer Science. Enrollment in 399b is conditional upon successful completion of 399a, and permission of your advisor.

Brief Description: Senior work, undertaken under the guidance of a faculty member, on a topic chosen by the student and advisor. Students may wish to start by looking at the thesis advising topics documents posted by faculty by following the links provided on the course web page and/or contact Haverford faculty about topics not on these lists. Selection of the proper topic is one of the most important steps of the thesis process; a good topic will be of interest to both the student and advisor.

Details: An undergraduate senior paper may or may not include original research, but must present an indepth exploration of a topic in computer science (with particular focus on understanding and evaluating some element of the computer science literature). The paper should demonstrate the student’s ability to apply, in a new context, the fundamental themes and objectives that connect all CS classes, such as:

- separating a problem definition from its solution.
- describing clearly a proposed solution (typically with examples).
- understanding the correctness and applicability of a proposed solution.
- comparing several proposed solutions in terms of clarity, resource requirements, etc.

It is common for the thesis to center on a particular algorithm or computing system, and present the correctness and/or computational complexity thereof. However, this is not required. Students have successfully pursued other topics, such as human-computer interaction. The one core requirement is that the student demonstrates the ability to think deeply and communicate clearly about a computer science topic beyond the depth covered in classes. The written thesis often resembles a review article, which explores in depth a collection of primary source articles from a single research group, or a survey article, which compares primary source articles from different origins.

Requirements: The work culminates in the writing and oral presentation of a paper. The student must also demonstrate the research skills required to produce this, in accordance with the deadlines below.

Expectations: Detailed learning goals for the research as well as grading guidelines are available from the departmental section in the college catalog, under "Senior Project". Once chosen, your advisor should have a discussion with you regarding those expectations.
**Deadlines (tentative):** Adhering to the following guidelines is an important part of your thesis grade. It begins with the advisor selection process.

- *In the first week of classes,* faculty members in the department give a short presentation on their research interests centered around common themes, along with a list of reading materials for students to look over.

- *In the second week,* students submit a ranked list of three possible thesis topics, each listing an advisor. They may list a topic with an advisor from another institution with prior written approval from the faculty member running senior seminar. Two of the topics listed must be in the primary research area of faculty members in the department, as we are limited in our ability to serve a wide variety of exploratory topics. If a student has been working on a project with a faculty member in the past, they have the opportunity to continue working with that faculty member as their research supervisor. Students must always build upon any previous work they have completed and demonstrate new and improved understanding of their research topic.

- *By the end of September,* students have been assigned a faculty advisor who will guide their research project throughout the process. This usually means weekly meetings with that advisor on a regular basis.

- *Before fall break,* students must submit a thesis proposal, consisting of an abstract describing the proposed work, a preliminary reading list of references they have found, and give a mini-presentation on the topic to the senior seminar class.

- *Before Thanksgiving break,* students turn in a complete draft of their literature review, with an annotated bibliography. This is a standard bibliography in which each reference includes a short description of what material was used from that citation.

- *In the first week of December,* students are required to give a public poster presentation. This is almost always where the work of the first semester comes together in a more completed form.

- *At the end of fall semester classes,* the complete literature review is due. This includes a title, abstract, chapter outline, introduction, and a plan of action for the remainder of the thesis (if chosen).

- During the grading period, a second reader (not the faculty advisor) is assigned to each thesis to provide detailed written feedback to both the student and their advisor, and consults with the department as to whether the student will be allowed to continue on for an optional second semester.

- *Before spring break,* a complete rough draft of the thesis is submitted to the faculty advisor. *The week after spring break,* a semi-final draft including all of the content for all of the sections, is due to the advisor also.

- *In the tenth week of classes,* students begin rehearsing their oral presentations during senior seminar, with attendance and feedback required for other students' presentations given then. This typically takes place over a period of several weeks.

- *In the penultimate week of classes,* the final version of the senior thesis is due, submitted to the advisor and the faculty member running senior seminar. By the end of classes, a complete and corrected copy is submitted to the department chair and archived in the library.

- *During reading period,* students give a short public oral presentation of their work in front of a quorum of faculty members.