Computer 399

399a: (Fall semester, *required*.) A literature review which entails thorough research of a topic without original work. Prerequisite: Computer Science seniors majoring at Haverford in good standing.

399b: (Spring semester, *elective*.) Extending your literature review with original contributions, culminating in the writing and oral presentation of a paper. Prerequisite: successful completion of 399a, and permission of your thesis advisor.

Overview: According to the college catalog, the senior thesis is an opportunity "to challenge the student's powers of analysis and synthesis and to foster the creative use of the knowledge and skills that have been acquired in previous studies." As such, it is the culmination of your course work at Haverford, and for many students can be the highlight of their college experience. Proper attention to details and deadlines will make this a successful and pleasant experience for you and your advisor.

The requirements include a thorough literature review of a research topic, culminating in a written thesis and an informal presentation at a poster session toward the end of the semester. Work on a fall thesis can be continued into the spring with agreement of your advisor, and the second semester will count as a 300-level elective. Students who choose this option contribute an original research paper extending their literature review, the demonstration of which can be a factor in determining departmental honors. There is also a formal presentation in front of a quorum of faculty members. Although you cannot fail your oral presentation, any understanding of your thesis that you can explain and communicate to your audience will be to everyone's benefit.

You will undertake all of this under the guidance of a faculty advisor on a topic jointly chosen by you and your advisor. Begin by looking at the thesis advising topics documents posted by faculty and following the links provided on the course web page. Selection of a proper topic is one of the most important steps of the thesis process; a good topic will be of interest to both student and their advisor.

Details: An undergraduate senior paper must present an in-depth exploration of a topic in computer science, with special 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.
- clearly describing 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.

A thesis can center on an algorithm or computing system and present the correctness and/or computational complexity thereof. However, this is not required. Students have successfully pursued other diverse topics, such as human-computer interaction, and a variety of data-oriented application. 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 therefore 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 sources from different origins. Students will be expected to demonstrate all of this in accordance with the deadlines overleaf.

The single most important factor for success is a regular weekly meeting with your thesis adviser.

Grading: Attendance and participation in senior seminar (including the presentation requirements), together with meeting deadlines, will account for about 25% of your grade. The remaining 75% is based on the thesis itself, and our assessment of your understanding of it. Your advisor is the most crucial element in determining this latter component.

The senior paper is primarily assessed by the student's advisor. Another member of the department also reads the paper and provides feedback. The grade for the senior experience is assigned by the advisor, based on the quality of the student's written paper (judged in terms of illustrating mastery of the learning objectives relevant to the chosen topic).

A tentative class schedule with deadlines is overleaf.

Senior Seminar

Steven Lindell

Tentative schedule for 2023 - 2024

Date	**Meeting Topic**	**Assignment Due**
Sep 8	Orientation, faculty introductions (read faculty research profiles too), non-HC advisors, double majors	*Degree audit*
Sep 15	No meeting	*Advisor selection form*
Sep 22	*Reading with Purpose* by Suresh Venkatasubramanian	Exercise in reading
Sep 29	No meeting	*Meet with advisor*
Oct 6	Preparing your proposal: title; reading list (primary, secondary, tertiary sources); an annotated bibliography	*Submit video presentation*
Oct 13	No meeting	*Thesis proposal*
Oct 20	**Fall BREAK**	None
Oct 27	Structuring your thesis: abstract; introduction; outline of what you plan to do; references; proper citations)	None
Nov 3	No meeting	*Rough draft*
Nov 10	table of contents; motivation, background, summary, future directions	None
Nov 17	No meeting	None
Nov 24	***THANKGIVING***	*Full draft*
Dec 1	No meeting	None
Dec 8	Your second reader will evaluate your poster and give you feedback on your thesis draft.	Poster presentation (Zubrow Commons)
Dec 15	No meeting	
Dec 22	No meeting	*Thesis due*
	WINTER BREAK	
Jan 26	Go over requirements for the remainder of the semester	
Feb 2	The role of failure in scientific research	*Assigned reading*
Feb 9	No meeting	*Research proposals*
Feb 16	No meeting	*None*
Feb 23	Brief meeting	*Attend*
Mar 1	No meeting	*None*
Mar 8	No meeting	*Rough draft*
Mar 15	**Spring BREAK**	*None*
Mar 22	No meeting	*Incorporate comments*
Mar 29	Meet to determine rehearsal schedule for presentations	*None*
Apr 5	No meeting	*Semi-final draft*
Apr 12	First group of rehearsals	*Presentation*
Apr 19	Second group of rehearsals	*Presentation*
Apr 26	Third group of rehearsals	*Presentation*
May 3	No meeting	*Final version*
May 6	Oral presentations	*Final talk*
May 10	Last day to make corrections to your thesis	*Corrected copy*

Location and Time: Friday 1:30 – 2:30 PM in Founders 220