

BIOL B398: Biology Senior Seminar**Cancer Biology**

Adam Williamson Office: Park 212 Email: awilliams6@brynmawr.edu	Seminar: Mon. 1:10 pm - 4 pm (Park 264) <i>*individual meetings by appointment*</i> calbird.com/adam-williamson/student-hours
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OVERVIEW

A senior seminar broadly focused on cancer biology. Students will investigate the biology of cancer through critical reading of the primary literature and other sources and draw on findings, approaches, and ideas that cross disciplines. Students will also write and present a capstone independent research paper and facilitate a class discussion about their topic. Possible topics for student research are based on your interests and might include: the molecular and cellular development of cancer; cancer and environmental justice; tumor evasion/suppression of immunity; cancer immunotherapy. In addition, we will explore new innovations in cancer research led by researchers in industry and academia working in the Philadelphia area.

LEARNING OUTCOMES

After this seminar you will be able to...

- Examine and synthesize primary research about an area of cancer biology of personal importance to you and communicate your findings to colleagues in our seminar
- Write an original structured research paper about an area of cancer biology of personal importance to you that is accessible to a broad scientific audience
- Demonstrate developed science communication skills by presenting your work to your colleagues in the Biology Department in the form of an oral presentation

COMMITMENT TO BUILDING AND NURTURING AN INCLUSIVE CLASSROOM

In my role as seminar facilitator, I will strive to build and nurture an inclusive, responsive classroom that supports you as a student and human being. I value the diversity of backgrounds and experiences that together we bring into our space and I will try my best to provide an equitable learning environment that supports all seminar students.

I recognize that the practice of scientific research, both in the past and today, is not unbiased, but rather a reflection of the flawed society in which it occurs. I also acknowledge that harm continues to be done to people who hold historically excluded identities, including but not limited to first-generation, low-income (FGLI), LGBTQ+, neurodiverse, and BIPOC individuals.

I know that students face significant personal, familial, and societal stressors that place considerable demands on your time and energy, both inside and outside our classroom. I ask that if you encounter difficulties in this course, you reach out to me, your dean (or both) as soon as you are able so we can craft a path forward that works for you.

I welcome your feedback and commit to listening to/reading your concerns in full, believing that your experiences in this course are real, and responding to your concerns by implementing necessary changes to the best of my ability. In addition to regular student office hours, I offer the following avenues for you to reach out with any questions or concerns:

- 1) An initial conversation early in the semester to develop shared class norms that promote your full participation in our course
- 2) A mid-semester evaluation and conversation to implement any necessary changes during the term
- 3) A form at the top of the course Moodle to submit questions or concerns at any point during the term

WHAT TO EXPECT DURING MONDAY SEMINAR MEETINGS (MON. 1:10 pm - 4 pm)

We will connect for ~3 hours each Monday in Park 264. That's a long time! Each seminar meeting will be comprised of ~3 building blocks, as outlined on the course schedule. Short breaks between discussions and activities will also allow you to stretch your legs, caffeinate/have a snack, and engage in informal conversation with your colleagues.

Class meetings will usually contain an interactive discussion about readings related to a current topic in cancer biology, structured time to support your senior thesis work. Short lectures, as necessary, will help you gain the foundational terminology and methodology to enable you to engage with our course material, which lies at the cutting-edge of modern cancer biology research.

The primary goal of this seminar is to support your work towards completing your written Biology senior thesis and oral presentation to the department. I am thrilled to have the opportunity to work with each of you to find a topic you are about deeply and desire to engage with throughout the semester.

Early in the semester you will find your thesis topic and discuss case studies drawing on a diversity of topics related to cancer biology. As students work towards completion of their first drafts we will shift towards discussion of representations of cancer biology, including Susan Sontag's "Illness as Metaphor" and documentary films about environmental links to cancer and the development of cancer immunotherapies. Finally, the seminar will end with discussion of cutting-edge research methods and their application to cancer therapies.

TIPS TO GET STARTED ON YOUR SENIOR THESIS PAPER

Structured work during our first seminar meetings will focus on supporting your efforts identify your research topic and craft your key questions. If you are struggling to find a topic of interest, I recommend you skim the list of topics we'll discuss during seminar meetings (please see Course Schedule on the Moodle).

STRUCTURE OF YOUR SENIOR THESIS PAPER

You will write a research paper, approximately 15-18 double spaced pages long, structured as follows:

- Description of the phenomenon (including, social, political, and public health importance and relevance if appropriate)
- What we know about how it works or evolved
- What we don't know about how it works or evolved
- What we should do going forward, including steps we can take to fill in our understanding and highlighting political or social movements if appropriate

INDIVIDUAL MEETINGS TO SUPPORT YOUR WORK

I anticipate meeting with each student frequently during the semester outside of class time to support your research. In person meetings are available on Friday afternoons by appointment here (or other times via email): <https://calbird.com/adam-williamson/senior-seminar>

COURSE ASSIGNMENTS

Course assignments and corresponding weights indicated below. Course graded out of 400 points. Weight and number of assignments subject to change if necessary.

Points for Key Pieces of Evaluated Work (400 points total for class)

Topic summary, key questions, and provisional outline (~2pgs).....	20 points (c)
Annotated bibliography.....	20 points
Detailed paper outline.....	40 points
Student-facilitated seminar meeting.....	40 points
Complete draft of senior thesis.....	60 points
Final version of senior thesis.....	60 points
Practice thesis presentation to seminar.....	20 points (c)
Thesis presentation and "Defense".....	40 points
Attendance & seminar contributions.....	100 points (c)

(c) = graded on completion

Summary of Important Deadlines

Friday Sept. 17 - Topic summary and brief outline of sections due on Moodle (5 pm EST)

Friday Sept. 24 - Annotated Bibliography due on Moodle (5 pm EST)

Friday Oct. 8 - Detailed outline due on Moodle (5 pm EST)

Friday November 12 - Complete draft of research paper due on Moodle (5 pm EST)

Thursday November 18 - Peer review draft exchange

Monday November 22 - Feedback and comments to peer

Monday December 6 - Practice presentations in class

Thursday December 9- Final version of your senior paper due on Moodle (5 pm EST)

Tuesday December 14 - Research Symposium: Oral Presentations to the Biology Department

Previews of Significant Assignments (Full prompts will be available on the Moodle)

Senior Thesis Paper

A structured research paper ~15-18 double-spaced pages in length about a topic related to cancer biology of personal importance to you. Your paper should be accessible to a broad scientific audience and rooted in the primary research literature. The structure of the research paper will be discussed in detail during early seminar meetings.

Structured work to prepare a topic summary and provisional outline will help you conceptualize your project as you write and revise your senior thesis.

Thesis Presentation and “Defense”

Each student will present their work during a presentation ~8 minutes in length using slides as visual aids to guide the audience. The final seminar meeting will be a space for students to deliver practice talks to the group. We will schedule “defenses” early in the semester after students have identified their topics and confirmed their faculty second reader.

ATTENDANCE POLICY

Your contributions to seminar are the backbone of our course so it is my expectation that you will attend every seminar meeting that you are able to. **In recognition of your contributions to the class, attendance comprises 25% of your final grade (100 points total, 8 point reduction for each unexcused absence from a Monday seminar meeting).** *This attendance policy is specifically designed to help both you and the instructor identify roadblocks for your senior thesis work as early in the semester as possible.*

That said, I am fully cognizant that we are all working in the context of a pandemic during cold/flu season and this will be a challenging term. **I sincerely care about your well-being and ask that if you are experiencing mild or severe symptoms of COVID-19 you take care of yourself and those around you and err on the side of caution when deciding whether to come to class.**

As your circumstances allow **I ask that you keep in contact directly with me or through your dean if you anticipate missing a Monday seminar meeting.**

DUE DATES AND EXTENSIONS

Please submit your work on Moodle by the deadline to protect your time and allow me to provide actionable feedback in a timely manner. I will discuss extensions on a case-by-case basis but please know the end of semester deadlines for the written thesis and recorded presentation are set by the department and apply to thesis students across the institution.

GRADES AND PROVISIONAL GRADING SCALE

Grades on Moodle: The overall course grade visible on Moodle is not a reflection of your current grade for the course. I understand this is confusing for students. So why is it this way?

The Moodle gradebook requires the instructor to enter percentages for each assignment prior to the term and is somewhat inflexible if changes are required during the semester. Because we are working under uncertain circumstances this term it is important to me that there be some possible flexibility on assignments and percentages if necessary.

Grades for this course will likely be assigned as follows:

93 - 100% = 4.0
 90 - 92% = 3.7
 87 - 89% = 3.3
 83 - 86% = 3.0
 80 - 82% = 2.7
 77 - 79% = 2.3
 70 - 76% = 2.0

ACCESS AND ACCOMMODATIONS

If you have any questions about access or accommodations, please contact me to schedule a time to discuss any concerns you might have confidentially. In addition, I will support any documented accommodation communicated to Bryn Mawr access services. **Please note that this course does not require you to complete any timed quizzes or exams.**

Access Services (*italicized text BMC Access Services*)

Students needing academic accommodations for a disability must first register with Access Services. Students can call 610-526-7516 to make an appointment with the Director of Access Services, Deb Alder, or email her at dalder@brynmawr.edu to begin this confidential process. Once registered, students should schedule an appointment with the professor as early in the semester as possible to share the verification form and make appropriate arrangements. Please note that accommodations are not retroactive and require advance notice to implement. More information can be obtained at the Access Services website. (<http://www.brynmawr.edu/access-services/>)

Recording class (*italicized text BMC Access Services*)

Any student who has a disability-related need to record this class first must speak with the Director of Access Services and to me, the instructor. Class members need to be aware that full class meetings may be recorded.

Title IX concerns: Bryn Mawr/Haverford College is committed to fostering a safe and inclusive living and learning environment where all can feel secure and free from harassment. All forms of sexual misconduct, including sexual assault, sexual harassment, stalking, domestic violence, and dating violence are violations of Bryn Mawr/Haverford's policies, whether they occur on or off campus. Bryn Mawr/Haverford faculty are committed to helping to create a safe learning environment for all students and for the College community as a whole. If you have experienced any form of gender or sex-based discrimination, harassment, or violence, know that help and support are available. Staff members are trained to support students in navigating campus life,

accessing health and counseling services, providing academic and housing accommodations, and more.

The College strongly encourages all students to report any incidents of sexual misconduct. Please be aware that all Bryn Mawr/Haverford employees (other than those designated as confidential resources such as counselors, clergy, and healthcare providers) are required to report information about such discrimination and harassment to the [Bi-College Title IX Coordinator](#).

Course Schedule: BIOL B398 Senior Seminar - Cancer Biology
(Subject to Change if Necessary)

Date	Seminar Meeting Topic	Preview of Seminar Meeting	Readings to Prepare for Seminar	Thesis Work Focus
M 8/30	Welcome! & Introduction to Cancer Biology	<ol style="list-style-type: none"> Welcome to Senior Seminar! Shared expectations and norms How to read for this class and prepare for seminar meetings Pathophysiology of cancer: colon cancer case study 	None	Find your thesis topic
M 9/6	No class	No class – Labor Day	Please look ahead to “Health and Illness”	Find your thesis topic
M 9/13	Health and Illness	<ol style="list-style-type: none"> Thesis: How to find sources, identify a topic and craft research questions Discussion: Hallmarks of Health & selections from “Emperor of all Maladies” Roundtable discussion of possible topics Visit: Dr. Annie Jeong 	<ol style="list-style-type: none"> López-Otín & Kroemer, Hallmarks of Health Selections from “Emperor of All Maladies” by Siddhartha Mukherjee (Part 1) 	Find your thesis topic and work on summary and brief outline Topic summary and brief outline due Fri. 9/17 5pm EST
M 9/20	Hallmarks of Cancer	<ol style="list-style-type: none"> Discussion paper: Hallmarks of Cancer & “Emperor of all Maladies” Thesis: Informal presentations about your research topic 	<ol style="list-style-type: none"> Hanahan & Weinberg (2011), Hallmarks of Cancer: The Next Generation Selections from “Emperor of All Maladies” (Part 2) 	Work on summary and brief outline Annotated Bibliography Due Fri. 9/24 5pm EST
M 9/27	Melanoma	<ol style="list-style-type: none"> Thesis: Managing sources: Zotero 	<ol style="list-style-type: none"> “How Dermatology is Failing 	

		<p>Workshop & Informal Presentation of one of your Key Sources *Joint with other senior seminar section</p> <ol style="list-style-type: none"> 2. Developing your own facilitation style 3. Discussion papers: Dermatology & BIPOC patients, BRAF and melanoma 	<p>Melanoma Patients with Skin of Color"</p> <ol style="list-style-type: none"> 2. Selections from "Medical Apartheid" by Harriet A. Washington 3. Holderfield et al. Targeting RAF kinases for cancer therapy 	<p>Build out your outline & Identify and contact your second reader</p>
M 10/4	Conceptions of Cancer – Illness as Metaphor	<ol style="list-style-type: none"> 1. Book Club: "Illness as Metaphor" by Susan Sontag 2. Mid-semester evaluation/conversation 	Susan Sontag, "Illness as Metaphor"	<p>Research and Writing</p> <p>Detailed Outline Due Friday Oct. 8, 5pm EST</p>
M 10/11	No class fall break	No class – take a break!	None	None
M 10/18	Cancer and the Environment	<ol style="list-style-type: none"> 1. Film Screening: "Blue Vinyl" 2. Film discussion: "Blue Vinyl" 	None – take a break!	None – take a break!
M 10/25 <i>*Joint with other senior seminar section</i>	<p>Student-led discussions</p> <p>Topics Related to Presenting Students' Thesis Work</p>	<ol style="list-style-type: none"> 1. Student-led Discussion 2. Thesis: Roundtable discussion of writing progress 	TBD – Selected by Facilitator	Research and Writing
M 11/1 <i>*Joint with other senior</i>	<p>Student-led discussions</p> <p>Topics Related to Presenting Students' Thesis Work</p>	<ol style="list-style-type: none"> 1. Student-led Discussion 2. Thesis: Roundtable discussion of writing progress 	TBD – Selected by Facilitator	Research and Writing

seminar section				
M 11/8 <i>*Joint with other senior seminar section</i>	Student-led discussions Topics Related to Presenting Students' Thesis Work	1. Student-led Discussion 2. Thesis: Roundtable discussion of writing progress	TBD – Selected by Facilitator	Complete Thesis Draft Due Fri. 11/12 5pm EST
M 11/15	Conventional and Targeted Cancer Therapeutics	1. Discussion Paper: Zitvogel et al., (2013) Cancer Therapeutics 2. Biotech case studies 3. Thesis: Individual meetings with AW	Zitvogel et al. Mechanism of Action of Conventional and Targeted Anticancer Therapies	Revision Thesis Draft Peer Exchange 11/18
M 11/22	Cancer Immunology	1. Science communication workshop <i>*Joint with other senior seminar section</i> 2. Intro to cancer immunology 3. Discussion about cancer immunology and immunotherapy	Please engage with materials about scientific communication and example talks (Moodle)	Revision Commented Thesis Draft Returned to Peer
M 11/29	Cancer Immunotherapy	1. Film Screening: "Breakthrough" 2. Film Discussion: "Breakthrough"	None – take a break!	Finish Revision and Oral Presentation
M 12/6 <i>*Joint with other senior seminar section</i>	Practice Thesis Talks & Reflection	1. Practice Talks 2. Reflection & Celebration	None – please focus on your revision and presentation!	Final Version of Thesis due Th. 12/9 5pm EST