Bisc10: The Biology of Women’s Health  
Summer 2020  
Professor Melissa Kosinski-Collins, kosinski@brandeis.edu  
Dr. Sumana Setty, sumana45@brandeis.edu  
Office Hours: By appointment 9 am-4 pm EST, Monday-Friday  

Course Dates:  Monday, June 1, 2020- Sunday, August 10, 2020  

Summary  
This 10-week online course is designed for students who are interested in learning the basic biology of women’s health. Diseases such as HPV, breast cancer, and Zika are global health concerns. Have you ever wondered why certain diseases seem to impact females more often than males? How are they diagnosed and when? Vaccinations, screenings and treatments exist for some of these diseases, but are they effective? What are the normal physiological processes that happen in the human body and how are these affected by pregnancy? What are ethical concerns related to these diseases and treatments? In this ten-week course, we will explore the molecular, genetic, medical and clinical basis of several diseases impacting women’s health. We will conduct laboratories looking at viral structure and assembly, model clinical procedures for diagnosis, and begin to develop an understanding of how governmental policy is designed surrounding these concerns.  

Prerequisite: none  

Learning Objectives  
After completion of this course students should be able to:  
● Articulate some of the complexities and nuances surrounding women’s health concerns in our society  
● Draw and describe the hormonal, reproductive and unique metabolic cycles of women  
● Draw and define the life cycle, structural characteristics, and genetic components of viruses including HPV and Zika  
● Define the inheritance patterns, genetics, and genomics of genes primarily impacting women’s health including BRCA.  
● Describe some clinical diagnostics used in assessing women’s health and articulate the complexities concerning diagnosis, treatment, vaccination and ongoing care recommendations  
● Understand basics of STDs and various forms and functions of contraception  
● Research and defend a policy recommendation in the area of women’s health  

Course Format  
This course will take place completely online using Latte (Brandeis’ learning management system) available at http://latte.brandeis.edu. The site contains all course materials and mechanisms for discussion, assignment submission and review of grades and feedback.  

This course will consist of 10, one-week modules. The class will consist of mini-lectures, readings, forums, hands-on activities/virtual labs, case studies, and discussions. The course is designed to require an average of 18 hours of non-synchronous course-work hours per week. You may work ahead, but to maintain a cohort among the class, you are required to participate in the forum and peer review process at the same time as your peers.
To facilitate consistency throughout the course, we will adhere to the same weekly set-up for assignment due dates. All assignments are due at 11:59 pm EST. Our course week will start on Monday and end on Sunday of the following week.

<table>
<thead>
<tr>
<th>Day</th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
<th>Saturday</th>
<th>Sunday</th>
</tr>
</thead>
</table>
| **Suggested work** | - Watch Week’s introductory lecture  
- Course content | - Reading Assignment for final project | - Course content  
- Complete Reading Assignment for final project | - Complete Assignment for final project  
- Course content | - Course content | - Complete course content | - Complete course content |
| **Assignment Due** | - Post to forum | - Final project exercise due | - Respond to forum posts from at least two other students | - Peer review of another student’s final project exercise  
- Reading reflections due  
- Final lab, assignment or case study due |

Each week, you are expected to:

- Watch weekly introductory course video (~30 minutes, not graded)
- Watch, read and explore the background course content (~3 hours, not graded)
- Complete a lab report or case study based on course content (~4 hours, graded)
- Read 1 or more chapters of the assigned course supplementary text and post weekly reflections (~2 hours, graded)
- Read a news article or internet post based on the weekly course content (~1 hours, non-graded)
- Post answers, questions and reflections to the course forum based on the reading (~1 hour, graded)
- Respond to a minimum of 2 forum posts provided by classmates per week (~1 hour, graded)
- Read, research, and complete an exercise relating to your final research project (~5 hours, graded)
- Review another student’s final project exercise (~1 hour, graded)

Brandeis seeks to welcome and include all students. If you are a student who needs accommodations as outlined in an accommodations letter, I want to support you. In order to provide test accommodations, I need the letter more than 48 hours in advance. I want to provide your accommodations, but cannot do so retroactively. If you have questions about documenting a disability of requesting accommodations, please contact Student Accessibility Support (SAS) at 781.736.3470 or access@brandeis.edu

**Required supplies:**

**Required Texts:**
There is no required textbook for this course. Required course material and reading will be posted on the course website. It may be beneficial to have any introductory biology textbook available as a background reference text if needed. Supplementary reading will be assigned from OpenStax Biology.

*The Birth of the Pill* by Jonathan Eig
**Required Software:** Google docs and/or Microsoft office, a microscope app for your phone/computer/tablet (i.e. ioLight Microscope), a device capable of taking digital pictures (tablet/phone/camera)

**Required supplies:** A headset or headphones with microphone

**Grading**

Your grade for the course will be determined by your scores on participation in the course forum, a weekly lab or case study assignment, a weekly written assignment leading toward your final project and a final written project which you must present virtually to your classmates.

1. **Weekly lab, assignment or case study:** Your weekly assignments will constitute 40% of your grade.

   Your weekly assignment will consist of completed pre and post lab assignments or case studies due each Monday of the course. Completed, uploaded PDF answers to these assessments will each be worth 5% constituting a total of 45% of your final grade. You should expect each of these assignments to take you approximately 3-5 hours to complete.

2. **Final Project:** Your final project will be 40% of your grade.

   Your final project is broken into several smaller assignments. You will receive feedback from the course instructor and your peers on each of these seven assignments and each will be worth 2% for a total of 14% of your final grade. The feedback you provide to your peers will constitute an additional 6% of your final grade. You will have an opportunity to rework these assignments before incorporating them into your final project.

   Your final project will have both a written component and oral presentation component. The oral presentation is worth 5% while the written document is worth 10% of your score. Your responses to the proposals of your classmates will be worth 5% of your score.

3. **Book reflection:** Weekly reflections about The Immortal Life of Henrietta Lacks will be worth 10% of your grade.

   Each week, you will be asked to read 1 to 2 chapters of our class non-fiction book. You will be asked to reflect on the week’s reading and submit your reflection to Latte.

4. **Forum Posts and Responses:** The forum posts and responses will be worth 10% of your final grade.

   Because part of your grade is based on participation, you are required to watch and participate in all lectures, labs and discussions. Failure to complete labs, case study, paper discussions, etc. on time will result in a loss of credit for that assignment.

**Late Policy**

While it is understood that as working adults with professional, academic, and personal responsibilities that you may encounter an unexpected interruption requiring you to be temporarily delayed in meeting a deadline as
outlined in this syllabus, we ask that you make every attempt to meet all due dates as this course is only nine weeks in duration. Late assignments will not be accepted as they disrupt the progression of the course. Your full, timely participation not only ensures that you reap the full benefits of this experience, but that your peers benefit from your engagement and feedback as well.

Confidentiality Statement

We can draw on the wealth of examples from our professional and/or teaching experiences during weekly discussions and in our written work. However, it is imperative that we not share information that is confidential, personal, sensitive, privileged, or proprietary in nature. In addition, we should respect our peers and work under the assumption that what is discussed here stays within the confines of the online classroom.

For your awareness, members of the University's technical staff have access to all course sites to aid in course setup and technical troubleshooting. Rabb School administrative staff have access to all courses for oversight purposes. Participants enrolled in these training courses can expect that individuals other than their fellow classmates and the facilitator(s) may visit their course for various purposes. Their intentions are to aid in technical troubleshooting and to ensure that quality course delivery standards are met. Strict confidentiality of student information is maintained.

Academic Integrity

Conduct inconsistent with the policies on academic honesty in "Rights and Responsibilities" will be treated seriously. All case studies, forum submissions, homework assignments, laboratory write-ups and written documents should be completed independently by the enrolled student. All completed assignments will be submitted to Turnitin for originality comparison. Depending on the severity of the infraction, students violating the course honor code will receive a non-droppable zero on the assignment and/or failing grade in the course.
---

**Syllabus Schedule:**

*Weeks shown in white are led by Professor Melissa Kosinski-Collins*

*Weeks highlighted in gray are led by Dr. Sumana Setty*

<table>
<thead>
<tr>
<th>DATE/Week</th>
<th>Topic</th>
<th>Learning Outcome</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td><strong>Introduction to course and scientific literacy</strong></td>
<td>• Define criteria to assess the validity of scientific sources</td>
<td>1. Weekly Lab/Case study/Assignment&lt;br&gt;2. Reading/Forum post&lt;br&gt;3. Book reflection&lt;br&gt;4. Final Project Assignment</td>
</tr>
<tr>
<td>June 1-June 7</td>
<td>1. Digital and informational literacy</td>
<td>• Navigate and access information from GALE Global Issues In Context&lt;br&gt;• List and evaluate at least 4 different types of information sources accessible from the internet&lt;br&gt;• Articulate and defend an opinion on women’s rights and gender equality</td>
<td>*Introduction of yourself&lt;br&gt;1. Digital literacy Project&lt;br&gt;2. Reading on Coronavirus&lt;br&gt;3. . Read chapters 1-2 of Birth of the Pill, post reflections&lt;br&gt;4. Policy Selection</td>
</tr>
<tr>
<td>Week 2</td>
<td><strong>Introduction to Biology</strong></td>
<td>• List the types, building blocks and functions of biomacromolecules&lt;br&gt;• Describe the relationship that biomacromolecules have with one another&lt;br&gt;• Summarize the role of the cell as the basic unit of life&lt;br&gt;• Define and describe the organelles within a cell</td>
<td>1. Case Study A: Biomolecules and Case Study B: Organelles&lt;br&gt;2. Reading on Mito Disease&lt;br&gt;3. Read chapters 3-5 of Birth of the Pill, post reflections&lt;br&gt;4. Annotated Bibliography</td>
</tr>
<tr>
<td>June 8-June 14</td>
<td>1. Biomolecules&lt;br&gt;2. Central Dogma&lt;br&gt;3. The cell&lt;br&gt;4. Organelles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Week 3</td>
<td><strong>Introduction to Human Physiology</strong></td>
<td>• Explain the way cells communicate with each other&lt;br&gt;• Describe and define the parts of the endocrine system&lt;br&gt;• Understand the basics of hormone feedback loops and the importance in the human body</td>
<td>1. Case Study: Barbara’s Thyroid&lt;br&gt;2. Reading 3&lt;br&gt;3. Read chapters 6-10 of Birth of the Pill, post reflections&lt;br&gt;4. Abstract</td>
</tr>
<tr>
<td>June 15-June 21</td>
<td>1. Cell communication&lt;br&gt;2. Hormone feedback loops</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
---
<table>
<thead>
<tr>
<th>Week 4</th>
<th>Female Physiology</th>
</tr>
</thead>
</table>
| June 22-July 28 | 1. Human Body systems  
2. Female anatomy  
3. Female Physiology and endocrinology |
| | • Explain the purpose of the reproductive system  
• Draw and identify the structures specific to female anatomy  
• Describe the hormones unique to females and their purpose  
• Draw and explain the ovarian cycle and luteal and follicular phases of the female reproductive system |
| | 1. Case Study (Menopause, Polycystic Ovary Syndrome, and the start of the menstrual cycle); created by Sumana  
2. Reading  
3. Read chapters 11-15 of *Birth of the Pill*, post reflections  
4. Scientific Context of Policy |

<table>
<thead>
<tr>
<th>Week 5</th>
<th>Genetics and Inheritance</th>
</tr>
</thead>
</table>
| June 29-July 5 | 1. DNA and chromosomes  
2. Karyotypes  
3. Mechanisms of inheritance |
| | • Describe DNA and chromosomal structures and features  
• Draw and interpret a Karyotype  
• Apply the principles of Mendelian inheritance in humans to a disease |
| | 1. DeafBlind Case Study  
2. Reading on the Discovery of DNA  
3. Read chapters 15-18, post reflections  
4. Public Opinion of Policy |

<table>
<thead>
<tr>
<th>Week 6</th>
<th>Breast and Ovarian Cancer</th>
</tr>
</thead>
</table>
| July 6-July 12 | 1. DNA and genetic control of disease  
2. BRAC-1 gene  
3. Diagnosis and treatment  
4. Genetic counselling |
| | • Describe the underlying principles behind cancer and cancer development  
• Define the origin and mutations associated with BRCA-1 and its link to breast/ovarian cancer  
• Discuss treatment and diagnosis of breast and ovarian cancer  
• Elucidate the role of a genetic counselor in BRCA testing  
• Defend an argument concerning the ethics of genetic testing |
| | 1. Case Study  
2. Reading  
3. Read chapters 19-22, post reflections  
4. Ongoing research of policy |

<table>
<thead>
<tr>
<th>Week 7</th>
<th>Reproduction</th>
</tr>
</thead>
</table>
| July 13-July 19 | 1. Pregnancy  
2. Development  
3. Hormonal Changes |
| | • Explain the trimesters of pregnancy and general embryological development in each trimester  
• Demonstrate knowledge of changes in hormone levels and their effects during pregnancy  
• Identify causes of pregnancy loss |
| | 1. Case Study  
2. Reading  
3. Read chapters 23-26, post reflections  
4. Policy recommendation |

<table>
<thead>
<tr>
<th>Week 8</th>
<th>Lactation and Nutrition</th>
</tr>
</thead>
</table>
| July 20-July 26 | 1. Lactation stages  
2. Lactation nutritional needs |
| | • Explain the nutritional needs of neonates from birth through the first year of life  
• Describe the hormonal, physiological, and anatomical changes that occur postpartum in lactating moms |
| | 1. Case Study  
2. Reading  
3. Read chapters 27-30, post reflections  
4. Aggregate report |
<table>
<thead>
<tr>
<th>Week 9</th>
<th>STIs and Contraception</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 27-August 2</td>
<td>3. Formula and other supplements</td>
</tr>
<tr>
<td></td>
<td>● Identify the nutritional benefits of breastmilk over formula</td>
</tr>
<tr>
<td></td>
<td>● Discuss advertising and marketing strategies of formula companies and effects of rates of formula use in various countries</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 10</th>
<th>HPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>August 3-August 9</td>
<td>1. Virus Assembly and Structure</td>
</tr>
<tr>
<td></td>
<td>2. HPV biology</td>
</tr>
<tr>
<td></td>
<td>3. Diagnosis and impact</td>
</tr>
<tr>
<td></td>
<td>● Draw and label the parts of a virus and the virus reproductive cycle</td>
</tr>
<tr>
<td></td>
<td>● Describe the structure and infection mechanism of HPV</td>
</tr>
<tr>
<td></td>
<td>● List epidemiological statistics concerning HPV infection</td>
</tr>
<tr>
<td></td>
<td>● Understand the mechanism of action and efficacy of the HPV vaccine</td>
</tr>
</tbody>
</table>

This is our last week of class. Please complete your classmate critique by 9 am on August 9.