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**First Year Seminar 153:**

**Designer Genes: The Science and Ethics of Genome Editing**

**Fall 2023**

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Each FYS course is assigned a Writing Associate (or WA). WAs are Lafayette Students that have been selected and trained by the College Writing Program to assist their peers with their writing. You will meet with Tess 4 times over the course of the semester as noted in the syllabus to discuss your in progress assignments. These meetings are mandatory. If you would like additional assistance with your writing the College Writing Program also offers drop in hours where you can meet with a WA (this will not be the designated class WA). More information on that can be found here: <https://cwp.lafayette.edu/for-students/drop-in/>

**Class Meetings:** Tuesdays and Thursdays 9:30-10:45 AM, AEC 243

**Office Hours:** Mondays and Thursdays 3:00-4:00 PM, Oechsle Hall 309A

During office hours students can discuss anything they want with me. You do not need to ask my permission or make an appointment with me to attend regularly scheduled office hours, just drop by.

If you cannot make my regularly scheduled office hours you can schedule a meeting with me at a different time here: <https://calendly.com/stawickt/meeting-with-dr-stawicki> you will have the option to select a zoom or in person meeting. This link will also be on the course moodle page. Please note I do not allow students to schedule meetings more than one week in advance.

**Course Website:** <https://moodle.lafayette.edu>

All assignments and readings will be posted on the course website. You should make sure to check the website regularly to keep up with the class material.

Moodle privacy statement: Moodle contains student information that is protected by the Family Educational Right to Privacy Act (FERPA).  Disclosure to unauthorized parties violates federal privacy laws.  Courses using Moodle will make student information visible to other students in this class.  Please remember that this information is protected by these federal privacy laws and must not be shared with anyone outside the class.  Questions can be referred to the Registrar's Office.

**Course Texts**

Required:

The Gene: An Intimate History by Siddhartha Mukherjee

 A Crack in Creation by Jennifer A Doudna and Samuel H Sternberg

Recommended:

 The St. Martin’s Handbook by Andrea Lunsford 9th Edition

We will be having multiple in class discussions around readings from The Gene and A Crack in Creation so it is important to purchase these books so you can fully participate in class. You should be able to find inexpensive used copies of both books. If your books do not arrive before the start of the semester there are reserve copies available at the library.

Additionally, as an FYS this course requires a writing handbook. I recommend The St. Martin’s Handbook 9th edition. It is a wonderful resource on college level writing that you can use as a reference throughout your college career. If you are concerned about the cost of this text there are references copies available at the library, so you can still get access even if you do not own your own copy. The 8th edition also contains much of the same information at a lower cost so purchasing that instead is another option. If you go that route just make sure to base your readings on chapter names as the chapter numbers are different in the two editions. I will additionally try to provide alternative readings for the content we will discuss from this book when feasible. There is also an online freely available writing handbook which you can find at the following link: <https://owl.purdue.edu/owl/index.html> that you may find as a helpful resource in this and your other classes.

**Course Description:** Scientists have developed tools to directly manipulate DNA, but should we use them? In this course, we will examine the history of attempts at genetic modification leading up to the technologies available today. We will work along the way to separate fact from fiction in the public discourse on this topic and explore the broad range of considerations beyond just the science going into decisions about where to draw the line on allowable genetic modifications.

**Course Objectives:**

The goals of this course is to have students:

* Use critical and analytical thinking when reading source material
* Develop effective written communication skills and hone your writing through the process of reiterative writing
* Gain an understanding of the history of attempts to influence genomes and the modern techniques that are available
* Become aware of the ethical considerations that influence decisions on genome editing

**Course Learning Outcomes:**

Learning outcomes are things that students should be able to do after they complete the course. This course has a number of outcomes, some shared amongst all FYS courses, some shared amongst all college writing courses, and some specific to the topic we will cover in this course.

Learning outcomes specific to the course topic:

* Think critically about scientific claims and evaluate whether they are valid based on existing evidence
* Demonstrate a basic understanding of the scientific process
* Demonstrate a basic understanding of the techniques currently available to manipulate genes
* Generate informed opinions on the use of gene manipulation based on an understanding of the relevant historical, ethical, and scientific information

Learning outcomes shared by all FYS courses:

* Demonstrate critical thinking strategies related to  interpretation and evaluation of texts (verbal, visual, or performative) in the context of course materials.
* Identify and consider one’s assumptions, thereby building informed perspectives.
* Information Literacy
	+ Identify and use information relevant to a specific purpose or goal.
	+ Employ effective search strategies to locate useful information.
	+ Access and use information ethically and legally

Learning outcomes shared by all writing courses:

* Analyze a variety of rhetorical situations.
* Identify and employ a range of strategies for discovering, developing, organizing, revising, and editing.
* Identify and apply the discourse conventions of a chosen academic discipline(s) or fields(s) (including conventions of genre, format, citation, structure, and vocabulary).

**Class format:**

The majority of the class sessions will focus on the analysis and discussion of the assigned readings. While I may briefly summarize key points from the readings at the start of class and provide discussion prompts it is expected that the majority of discussion will be student driven. You will be expected to complete the assigned readings before class and come prepared to discuss them in class. It is expected that all students will be active participants in class.

**Attendance Policy:**

As a discussion based course, class attendance is a key part of the learning experience. As such students are expected to attend all class sessions in person. However, you should not attend class if you suspect you have a contagious illness. If you cannot attend a class session due to illness or a reasonable conflict it is your responsibility to notify me before class so we can come up with an alternative plan for you to earn participation credit for the missed class. A failure to do so will negatively impact your grade. Repeated absences will require a Dean’s Excuse.

**Evaluation and Grading:**

Grades will be assessed based on a combination of assignments and in class participation as outlined below. More details on what is expected for the individual assignments will be on moodle.

Preclass Preparation Assignments (20%): You will be expected to comment on the assigned readings for each class period prior to class. This will be either through moodle forums or using Perusall depending on the reading. For moodle forums you will get points for the number of posts you make up to a certain expected amount, and for Perusuall you will get a grade based on your engagement with the material. There may also be other small class preparation assignments throughout the semester.

Class Participation (20%): Your participation grade will be based on attending class and **actively** participating in in-class discussions and in-class work activities.

Reflections (20%): You will submit three reflection documents throughout the semester. The first will be on your thoughts on both genome editing and the transition to college going into the course. The second will be around ½ way through the semester and you will be asked to reflect on how your views have and haven’t changed based on what you have learned thus far. Then at the end of the semester you will submit a final reflection that will contain revised versions of your first two reflections as well as a final reflection on how your views changed over the course of the semester.

Comparing Sources Assignment (12%): You will find a peer reviewed paper related to a topic in the course that has some form of coverage geared towards a nonscientific audience. You will also be asked to use generative AI to summarize the article. You will then write up a report summarizing the key points of the article and comparing how it was presented in the different sources.

Misinformation Assignment (12%): You will be asked to find a piece that contains blatant misinformation or sensationalism about genome editing. You will then carry out research to refute the information in that piece and write up a short report refuting it. You will present on this assignment in class while working on it to get feedback from your peers.

Position Paper (16%): You will write a researched positioned paper arguing either for the use or a restriction on the use of genome editing in a specific circumstance.

Final grades will be determined by the following scale:

|  |  |  |  |
| --- | --- | --- | --- |
| **Grade** | **Percentage** | **Grade** | **Percentage** |
| A | 93.0 to 100 | C | 73.0 to 76.9 |
| A- | 90.0 to 92.9 | C- | 70.0 to 72.9 |
| B+ | 87.0 to 89.9 | D+ | 67.0 to 69.9 |
| B | 83.0 to 86.9 | D | 63.0 to 66.9 |
| B- | 80.0 to 82.9 | D- | 60.0 to 62.9 |
| C+ | 77.0 to 79.9 | F | 0.0 to 59.9 |

**Please note that out of fairness for all students, final grades will not be bumped or rounded up or down.**

**The Importance of an Inclusive Classroom**

I would like to create a learning environment for my students that supports a diversity of thoughts, perspectives and experiences, and honors your identities (including race, gender, class, sexuality, religion, ability, etc.) To help accomplish this:

* If you have a name and/or set of pronouns that differ from those that appear in the class roster, please let me know. Additionally, please let me know if I am mispronouncing your name.
* If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to come and talk with me. If you do not feel comfortable discussing the issue directly with me, I encourage you to seek out another, more comfortable avenue to address the issue. You may want to consider contacting your class dean (<https://advising.lafayette.edu/class-deans/>) or the counseling center (<https://counselingcenter.lafayette.edu/>).
* If any of our class meetings or assignments conflict with your religious events please let me know during the first two weeks of the semester so we can make arrangements for you.
* If you have suggestions to improve the effectiveness of the course for you personally or other students or student groups please let me know.
* I (like many people) am still in the process of learning about diverse perspectives and identities. If something was said in class (by anyone) that made you feel uncomfortable, please talk to me about it.

**Resources for Student Support**

There are a number of resources available to support your learning at Lafayette. The following spaces site (<https://spaces.lafayette.edu/course/view.php?id=1276>) provides information on available offices and programs for academic support. Additionally, the Counseling Center (<https://counselingcenter.lafayette.edu/>) is available to provide counseling and educational programs to help you achieve your academic, social and personal development goals.

Lastly, if you do not have the financial resources to purchase needed course supplies for this or other courses (like textbooks, access to online modules, calculators, etc) the college has a new fund where you can supply for small grants to help cover these expenses: <https://lafayettec.az1.qualtrics.com/jfe/form/SV_85PLHSVphVGRdmC> .

**Disability statement:**

In compliance with Lafayette College policy and equal access laws, I am available to discuss appropriate academic accommodations that you may require as a student with a disability. Requests for academic accommodations should be made during the first two weeks of the semester if possible, so arrangements can be made. Students must register with the Office of the Dean of Advising and Co-Curricular Programs for disability verification and for determination of reasonable academic accommodations. You can find more information about the accomodations process at the following link (<https://hub.lafayette.edu/disability-services/>)

**Proper Usage of Course Materials**

At Lafayette College, all course materials are proprietary and for class purposes only. This includes posted worksheets, assignments, and other course items. Reposting such materials or distributing them through any means is prohibited. If you have any questions about proper usage of course materials please ask me.

**Academic Honesty:**

A major goal of the FYS program is to have students develop their writing skills. As such it is important that you are doing your own writing to get practice and feedback. While we will be using generative AI for some class assignments I expect students will only use these programs to develop content when it is part of the assignment. If there are any questions on what would or would not be an acceptable use of one of those programs please reach out to me in advance so we can discuss it.

Additionally, all students are expected to abide by the Student Code of Conduct policies around academic integrity. Please be sure to review the Student Code of Conduct at the following link (<https://conduct.lafayette.edu/student-handbook/student-code-of-conduct/>). If you have any questions on when collaboration is allowed or what sources you are allowed to use as it pertains to abiding by the Student Code of Conduct please contact me.

**Compliance statement:**

The student work in this course is in full compliance with the federal definition of a four-credit hour course. Please see the Registrar’s Office web site (<https://registrar.lafayette.edu/wp-content/uploads/sites/193/2013/04/Federal-Credit-Hour-Policy-Web-Statement.doc>) for the full policy and practice statement.

**Course Schedule**

Please note the schedule of covered material may change as the course progresses. I will update you on any changes in class.

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| --- | --- | --- | --- | --- |
| Week | Days | Topic | Readings | Assignments DueAnd Other Activities |
| 1 | 8/298/31 | Introduction to the courseLibrary Session Number 1**Meet in Skillman 004** | St. Martin’s Handbook Chapter 2 Expectations for College Writing, Readings from Librarian Bailin | Due Sunday 9/3: Initial reflection on gene editing |
| 2 | 9/59/7 | Thinking critically about readings on genome editingUnderstanding Heredity | St Martins Handbook Chapters 9 Reading Critically & 10 Analyzing ArgumentsPerusall: Articles on genetic technologyThe Gene – The Walled Garden, The Mystery of Mysteries, The Very Wide Blank, Flowers He Loved, and A Certain Mendel  | WA meeting # 1: Initial reflection on gene editing  |
| 3 | 9/129/14 | Genes and the Latest Research in EvolutionControversies around Evolution and Mendel’s Findings | The Gene – Truths and Reconciliations, and Transformation Perusall: Readings on modern day evolutionPerusall: Readings on controversies around evolution and Mendel’s findings | Due Friday 9/15: Revised copy of initial reflection on gene editing |
| 4 | 9/199/21 | Library Session #2**Meet in Skillman 004**What is a gene? | St Martin’s Handbook - Chapter 13 Conducting Research The Gene –That Stupid Molecule, Important Biological Objects Come in Pairs and That Damned, Elusive Pimpernel  | Due: Friday 9/22: Papers for Comparing Sources Assignment |
| 5 | 9/269/28 | Talk about papers for Sources AssignmentEugenics | St. Martin’s Handbook – Chapter 3 Rhetorical Situations, Chapter 14 Evaluating Sources and Taking Notes, Chapter 15 Integrating Sources The Gene – Eugenics, Three Generations of Imbeciles is Enough, Lebensunwertes Leben (Lives Unworthy of Living)  | Watch: The Eugenics CrusadeDue Sunday 10/1: Draft of Comparing Sources Assignment |
| 6 | 10/310/5 | EugenicsEditing writing and Do our genes define us? | Online readings from the Eugenics archive: <http://www.eugenicsarchive.org/eugenics/list3.pl> (Scientific Origins, Research Methods, Traits Studied and Research Flaws)Perusall: Eugenics Source Material The Gene – So, We’s the Same Perusall: Readings on whether our genes define usSt. Martin’s Handbook Chapter 6 Reviewing, Revising and Editing | WA Meeting #2: Comparing Sources Assignment |
| 7 | 10/1010/12 | **\*\*Fall Break, No Class Tuesday** Cloning Genes | The Gene – Crossing Over, Einsteins on the Beach, Clone or Die Perusall: Reading on the gene cloning patent | Due Friday 10/13: Comparing Sources Assignment |
| 8 | 10/1710/19 | Genetic DiseasesFertility treatment/embryo separation | The Gene - The Miseries of my fatherA Crack in Creation – The Quest for a Cure (p.3-15) Perusall: Readings on genetic diseases why evolution hasn’t eliminated them, and patenting human genes The Gene - The Birth of a Clinic, Interfere Interfere Interfere, Genetic Diagnosis: “Previvors” | Watch: GATTACADue Sunday 10/22: Draft of Misinformation Assignment |
| 9 | 10/2410/26 | Presentations on misinformation assignmentPresentations on misinformation assignment |  | WA Meeting #3: Misinformation AssignmentDue Sunday 10/29: Midcourse reflection |
| 10 | 10/3111/2 | Gene TherapyGene Therapy – Current Uses | The Gene - The future of the future, Genetic Therapies: Post Human (p. 463-467)Crack in Creation - The Quest for a Cure (p.15-21) Perusall: Readings on Jesse GelsingerFind an article on a current use of gene therapy  | Due Friday 11/3: Misinformation Assignment |
| 11 | 11/711/9 | Writing persuasive piecesCrispr/Gene editing | St. Martin’s Handbook – Chapter 11 – Constructing Arguments, Chapter 14 – Evaluating Sources and Taking Notes, Chapter 16 – Acknowledging Sources and Avoiding Plagiarism, Chapter 17 – Writing a Research ProjectCrack in Creation - The Quest for a Cure (p.22-34), A New Defense  | Watch: Human NatureDue Sunday 11/12: Outline and Annotated Bibliography of Position paper |
| 12 | 11/1411/16 | Crispr/Gene editingCrispr/Gene editing – uses in people | Crack in Creation – Cracking the Code, Command and Control The Gene – Genetic Therapies: Post Human (p. 467-475) Crack in Creation –To Heal the Sick | WA Meeting #4: Outline and Annotated Bibliography of Position paper |
| 13 | 11/2111/23 | Crispr/Gene editing in people – Current Uses**\*\*Thanksgiving break no class Thursday** | Perusall: Readings on advances in CRISPR technology  | Due Tuesday 11/21: Draft of position paper |
| 14 | 11/2811/30 | Ethics of human gene editingWe modify some genes!**Meet in Oechsle Hall 105** | The Gene - Genetic Therapies: Post Human (p. 475-483)Crack in Creation – What Lies Ahead, Epilogue: The Beginning Perusall: Reading on the ethics of human gene editingProtocols for gene editing experiments | Watch: Okja |
| 15 | 12/512/7 | CRISPR/Gene editing -GMO plants and animals CRISPR/Gene editing -GMO plants and animals  | Crack in Creation – The CRISPR MenagerieFind an article on a specific example of gene editing being used in plants or animalsPerusall: readings on ethical considerations of gene editing in plants and animals | Due Friday 12/8: Final Position Papers  |
| 16 |  |  |  | Due Friday 12/15: Final Reflections |