# HUMAN GENETICS

***IN THE COLLEGE CORE CURRICULUM***

CORE UA303, Tuesday and Thursday, 11:00 am – 12:15 pm, Silver 207

## PROFESSOR

Dr. Matthew Rockman
Department of Biology and Center for Genomics & Systems Biology
Email: mrockman@nyu.edu (in all correspondence please indicate that you're in the Human Genetics class)
Office Hours: Thursdays, 2 - 3 pm

## TEXTS

Required:
*Human Genetics Laboratory Manual*, available for purchase at the NYU bookstore.

Optional:
Links to genetics education resources and optional readings for each lecture are posted on Brightspace under *Resources*. Note that readings do not include everything we will cover in the course, and engagement with the Tuesday/Thursday lectures is essential for success in the course.

## COURSEWORK AND POLICIES

**LECTURES** Attendance is recommended, as exams are based largely on the content of the lectures. However, we do not take attendance. Lectures will be live-streamed on zoom for those unable to attend because of medical considerations. It's always better to attend in person, because then you can ask questions during the lecture. Because many of the concepts covered in this class are best represented visually, by drawing, students will be best served by taking notes by hand rather than by typing. If you choose to use a laptop in class, please be considerate of your neighbors and resist the urge to visit websites and watch videos. It's very distracting! Lecture slides will be available in Brightspace *after* each lecture.

**PROBLEM SETS** Short problem sets will be assigned most weeks, posted on Brightspace. These will be assigned Thursdays at noon and due in lab sessions at the start of the session the following week. As answer keys will then be posted, late work will not be accepted for credit. At the end of the semester your lowest problem set score will be dropped, and each remaining problem set will count as one-ninth of your problem set grade. Problem sets are to be completed *independently* by each student.

**EXAMS** The exams will contain questions covering the lectures and laboratory projects. The problem sets provide practice with the types of questions that will appear on the exams. There are four exams, including one given during the final exam period after the end of classes. You are expected to take all four exams, and if you miss an exam because you are sick or isolating, your exam score for the semester will be based on the three exams you completed. If you take all four exams, we will drop your lowest exam score when calculating your grade. This policy means that there are no makeup exams.

**FINAL PAPER** A very short final research paper will be due on Thursday, May 5. This paper will focus on a recent popular media account of a topic in human genetics. You will choose the media account and submit it for approval to your laboratory instructor at the March 3/4 lab session. The final paper will include a summary, analysis, and critique of the popular media account. Further guidelines are at the end of this document.

## LABORATORY

The laboratory sessions will be held in Silver 201 beginning February 3 and 4. You must be registered in a laboratory section in order to receive credit for the course. The sections have a limited capacity; consequently, you must attend the section for which you are registered. It is not possible to attend different sections on different weeks and it is not possible to perform make-up experiments. There are 9 formal laboratory sessions with experiments, and another four that are devoted to reviewing material before exams. For the 9 experimental sessions, the scoring metric involves a system of 50 points each week, allocated as follows:

| | |
|---|---|
| Quiz | 10 points |
| Attendance | 10 points |
| Lab Assignment | 30 points |

You are expected to arrive punctually for the beginning of the lab session. Arriving more than 10 minutes late will result in a loss of attendance credit for the session. You can be excused from the attendance requirement on a week that finds you sick or needing to isolate. Contact your laboratory instructor prior to the scheduled session to be excused in such circumstances. Note that the lab is an essential part of the Core Curriculum in Natural Sciences, and the official policy is that students can not pass the course if they miss more than three laboratory sessions.

Questions for the laboratory quizzes will be based on the description of the experiment in the laboratory manual; consequently, you must *read the relevant lab manual section before each session*. You will complete the quiz online prior to the start of your laboratory session.

The laboratory assignment must be completed and submitted during the laboratory period by working collaboratively with your laboratory partners.

## EVALUATION

The final grades for the course will be based on achievement on exams, homework, laboratory work, and final paper, each component weighted according to the following scheme:

| | | |
|---|---|---|
| Exams | 45% | (9 pts x 3) |
| Laboratory | 27% | (3 pts x 9) |
| Problem Sets | 18% | (2 pts x 9) |
| Final Paper | 10% | (10 pts x 1) |

Students accumulating at least 90% of the evaluation points will receive a letter grade no lower than an A-, those receiving at least 80% no lower than a B-, and so forth. If the median score for the course is lower than 85%, a linear adjustment ("curve") will be implemented to move the median up to the B+ range. Note that this adjustment can only improve your grade, and students are not in competition with one another. Finally, an opportunity for extra credit will be offered after the third exam, allowing students to add 3 percentage points to their total score accumulation; these points will be added after the curve is set to ensure that the extra-credit assignment is optional.

## OFFICE HOURS

I love to talk about human genetics, and I am eager to help you understand the material presented in class. Join me during online office hours, Thursdays from 2 to 3 pm, to go over the material. If your schedule makes it impossible for you to attend the scheduled office hours, please email me to make an appointment for another time. In all email correspondence, please indicate that you're a student in the human genetics class.

# HOW TO SUCCEED IN HUMAN GENETICS

**1. Attend lectures and ask questions.** Exams are based on the material covered in lecture, so to do well you'll need to be present and attentive during each lecture. That means showing up, paying attention, and most importantly, asking questions when you don't understand something. It is almost always the case that if you are confused by something in lecture, others are too, and they'll be grateful to you for asking questions.

**2. Do the problem sets independently.** The exams mirror the structure of the problem sets, so doing well on the problem sets is a good way to gain the skills and confidence to succeed on the exams. Keep in mind that you are to complete the problem sets by yourself. Use any resources you like, except your classmates.

**3. Prepare for your laboratory sessions.** The lab exercises provide hands-on exposure to genetics principles and practices, and they will be fun if you arrive prepared. That means you should read and understand the lab manual materials for each lab before you arrive.

**4. Invest time in your final paper.** The paper requires up-front effort, and you will do best by getting an early start. The paper is your opportunity to be the expert on the aspects of genetics that excites you the most, and the experience will repay your effort.

**5. Study for exams.** Review your notes and the lecture slides, which are posted after each lecture to Brightspace. Review the problem sets and make sure you know how to answer the questions. If you understand the material underlying the problem sets, you'll do well. Be careful about studying in groups. It's common in study groups for a few students to explain the material to the others, which gives the latter the false impression of understanding. Understanding means that you can explain the material, not that you can listen while it's being explained.

**6. Collect all the points.** Your course grade draws from many different kinds of assignments and assessments, and the steady accumulation of points is the sure way to get a good grade. Simply complete and turn in your problem sets, show up on time and prepared to every lab session, work on your final paper, study for exams, and do the extra credit assignment.

**7. Ask for help.** There are many people standing by to help you. Foremost among them are your laboratory instructors and professor. Ask them questions. Come to office-hours. In addition, you can get free one-on-one peer tutoring at the University Learning Center. Tutors who specialize in material covered by related Biology Department courses (including Principles of Biology, Genetics, and Biostatistics) are ready to help you.

**8. Stay ahead of the calendar.** If you need special accommodation for exams, talk to the Moses Center well in advance.

**9. Take care of yourself.** Make sure you have support to deal with stress and other personal issues that arise during the semester. Ask for help from Counseling Services. Call the Wellness Exchange any time, 24 hours a day, to talk to a professional who is prepared to help you: 212 443 9999. Remember that everyone here wants you to succeed and will work to make that happen.

# GUIDELINES FOR FINAL PAPERS

Genetics is in the news a lot. Stories in newspapers, on television, and across the internet report on new discoveries and applications of genetics. Because these stories are directed to general audiences, they usually have to simplify complicated information. Many adopt metaphors to communicate difficult ideas. Often, in order to generate page-views or maintain readers' interest, the popular media will report on modest, incremental findings as though they were radical and world-altering revolutions. One of our goals in this class is to become better consumers of scientific claims in the popular press. To that end, students will analyze a story in the popular media, assess its accuracy, and communicate their findings. These papers are a chance for you to dig into a topic of your own choosing.

**Topic ideas are due at your lab sessions on March 3/4**

You can pick a topic related to something covered in the syllabus. Creative suggestions are welcome. If you have an idea for a topic, it can be a starting point for a search for articles in the media. Alternatively, you can browse the media until finding an article of sufficient interest to serve as the focus of a paper. Identify two topic ideas, each pegged to an account in the media, and submit these topics to your lab instructor. The instructor will approve your first-choice topic if the proposed topic is appropriate (*i.e.,* sufficiently related to genetics and from a legitimate media source). These papers are to be written independently, so don't pick the same media account as your friends! Papers on identical topics will receive extra scrutiny. It's fine to ask friends to read drafts and offer advice, but it's not okay to present someone else's work as you own.

**Paper format**

Your paper should be 800-1200 words. This is very short! Like two pages short. You can also include up to one additional page of figures to illustrate your paper.

Your paper should introduce the popular media account that is the focus of your paper, then explain the underlying science, then evaluate in what ways the media account gets things right or wrong. Explain how the account is or is not successful in using metaphors and analogies.

Your paper must include citations to at least five references. One of these will be the media account. If the media account is centered on a newly published study, that study will be another of your references. You should absolutely read the study! Then you need to have found at least three more sources that you use to learn more of the details of the science. Cite each reference parenthetically in the paper where it's relevant, and then include a list of the references at the end. The exact way that you format the references is not important, so long as you use a consistent style.

Here is an example of an inline parenthetical citation and its associated reference at the end:

A lot of biological theory is posed in mathematical terms that are challenging for readers (Ou *et al.* 2022). In this class, I use analogies to try to make theoretical ideas more accessible.
[... the rest of the 800-1200 words ...]
[... up to one page of figures ...]
References:
Ou, WJA, GJB Henriques, A Senthilnathan, P-J Ke, TN Grainger, and RM Germain. 2022. Writing Accessible Theory in Ecology and Evolution: Insights from Cognitive Load Theory. *BioScience* biab133, https://doi.org/10.1093/biosci/biab133

**Papers are due at 10:45 am on Thursday, May 5.**