Kingsborough Community College of The City University of New York
Department of Biological Sciences
718-667-8686 x58007

Biology 37: Human Genetics, 3 credits/3 hours

Instructor: Lena Cosentino
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Course Description

BIO 3700 - Human Genetics
3 Credit(s) Hours: 3 hrs.

Introduces the principles of genetics with applications to human beings. The different systems by which characteristics are inherited, representative human hereditary problems, roles of heredity and environment, a historical approach to genetics research, chromosomal disturbances and some diseases, modern components of genetics in relation to human fertilization, surrogacy and genetic engineering.

This course does not satisfy the Biology Major elective requirement.

Flexible Core: Scientific World (Group E)

This non-majors Biology offering encourages students to become more "science literate" by learning and relating how current topics are constantly molding and influencing our changing world, specifically in the field of genetics. We will read, examine and critique current newspaper articles and use the Internet for our studies. Lectures will be supplemented by selected readings from the newspapers and/or primary literature, as applicable to the topic. Class discussions and case studies will extend our lecture topics of human heredity including gene therapy, somatic nuclear transfer and stem cells, thereby allowing an extensive and comprehensive treatment of them. The end of term ethics seminar requires students to utilize course material (class discussions and literature sources) to formulate and present their view/opinion on a topic the class chooses. Your support or disagreement will be written, presented and (re)evaluated in the format of a class seminar. The course grade calculation includes a portion for submission of Internet Assignments which will require you to either locate or access web sites utilized by students, researchers and teachers to procure specific genetic information then to answer specific questions.

Course Information

This course satisfies college requirements for a Group V science course. It does not meet CPI requirements for credit in the science area. This course is not required for Biology majors nor can Biology majors use this course as credit toward the biology major. BIO37 satisfies a CUNY Pathways Flexible Core: Scientific World (Group E) requirement.

Pre-Req/Co-Req

None.

Meeting Day

Tuesday 7:10 am - 7:55 am Room W215
Wednesday 7:10am - 7:55 am Room W215
Thursday 7:10 am - 7:55 am Room W215

Office Hours

Friday 7:10 -7:55 a.m. in Caf B (by appointment, please email LCosentino@schools.nyc.gov)

Textbook:

There is no required textbook for this course. Readings and Materials will be provided both in class and online.

Supplemental Resource: Human Genetics 12th Edition Ricki Lewis

CLOs:

1. To enrich our understanding of human heredity through exploration of the molecular, cellular and organismal levels.

2. To understand how normal and abnormal cellular processes affect humans at all these levels.

3. To learn what current ideas, issues and trends involve human inheritance.

4. To become aware of, and to be able to discuss ethical, legal and social issues in human genetics and the implications of these developments.

Student Learning Objectives

1. Understand the historical and current (modern) applications and approaches used in the field of human genetics.
2. Understand how genetic studies and practices include ethical, legal and social issues.
3. Be able to state what stem cells are, how they function, and where they exist
4. Be able to describe how genetic information is maintained
5. Describe how the information encoded in DNA specifies protein products.
6. Be able to describe which parts of the human reproductive system are involved in sex determination and development.
7. Know the sequence of sex determination from conception to determination of genetic sex, then gonadal sex, then phenotypic sex.
8. Understand and describe dosage compensation, and the difference between sex-influenced and sex-limited inheritance.
9. Name and describe teratogens that influence development; discuss accelerated aging and longevity
10. Be able to define and describe male and female fertility and infertility test
11. Be able to describe various assisted reproductive technologies utilized as childbearing options.
12. Be able to describe and discuss ethical issues in reproductive technology
13. Discuss pre-implantation technologies and potential therapies
14. Describe how/why surplus embryos are made and utilized
15. Identify and differentiate between normal and abnormal karyotypes and describe a condition to which they correspond.
16. Be able to describe several human syndromes based on the karyotype provided.
17. Explain holandric and maternal inheritance, illustrating with an example for each. Explain how most human traits are controlled by more than one gene. Give several examples.
18. Describe how height, hair and eye color are inherited.
19. Relate gene expression to environmental influence (e.g.: heart health and weight).
20. Describe blood types and their importance in blood transfusions and immune reactions between mother and fetus.
21. Be able to describe immune system disorders such as allergies and autoimmune reactions.
22. Describe several common genetic changes which occur in cancer cells.
23. Distinguish between Inherited susceptibility and sporadic cancers
24. Name and describe potential contributing factors in cancer (e.g.: colon, lung)

25. Learn how DNA profiling is utilized in forensics and disasters
26. Discuss challenges to genetic privacy.
27. Be able to discuss human inheritance with confidence.

Civility Statement

- As an institution of higher education, Kingsborough Community College and its faculty and staff are committed to its entire student body. As such, we strive to interact with each student equitably and professionally while providing an environment of mutual respect and civility.
- In the event a student has an allegation charge brought against him/her that is a breach of the Henderson Rules to Maintain Public Order or the Campus Code of Conduct, an immediate investigation will commence followed by a conciliation conference to determine the appropriate outcome within a thirty day period.
- The Judicial Affairs process at Kingsborough Community College is critical in providing an agenda for safety, yet simultaneously offering protection of the rights of students who may have been accused of being in violation of the Henderson Rules to Maintain Public Order and/or the Campus Code of Conduct. These rights have been afforded to each Kingsborough student under the bylaws that were established in 1969.

Academic Integrity Policy

- To reach academic success, one needs to uphold the 5 core values of honesty, trust, fairness, respect and responsibility. Failure to do so may result in charges of academic dishonesty. Academic dishonesty is prohibited by CUNY and Kingsborough Community College and is punishable by penalties, including failing grades, suspension, and expulsion. Examples of academic dishonesty include, but are not limited to, cheating, plagiarism, internet plagiarism, obtaining unfair advantages, and falsification of records.

- Plagiarism is the intentional use of another's intellectual creations without attribution (giving credit to the author). This is theft of materials from another author, and is prohibited. Determination and penalty ranging from grade reduction to course failure - is at the discretion of individual faculty members.

Attendance Policies

- Attendance will be taken at the start of class. Any student not present when attendance is taken will be marked *absent*. If a student arrives late to class, it is the responsibility of the student to inform the instructor at the end of class that he/she came in late. At that point, the *absence* will be changed to *late*. If a student does not inform the instructor that he/she came in late, that student remains marked as *absent* for that class.

- A grade of WU is to be assigned to students who attended a minimum of one class, completely stopped attending at any time before final exam week, and did not officially withdraw. ▪ Absence from exams earns a zero on the exam. Assignments submitted late receive partial credit. ▪ For distance learning, students must check-in by 2:20 PM on course days using Google Classroom to be marked present.

Course Outline

Week	Topic	Resources
1-3	**Introduction to Human Genetics**	OER - Supplemental: Chapter 1, 4, 6, 7
* During Week 4 you will have examination #1 (Introduction to Human Genetics)		
4-6	**Genetics and Disease**	OER - Supplemental Chapter 17 and 18
* During week 7 you will have examination #2 (Genetics and Disease)		
7-9	**Epigenetics**	OER - Supplemental Chapter 11
* During week 9 you will have examination #3 (Epigenetics)		
10-12	**Reproductive Technologies**	OER - Supplemental Chapter 21
*During week 12 you will have examination #4 (Reproductive Technologies)		
13-14	**Ethical Issues in Genetics**	OER
***During week 15 you will work on and complete your End-of Term Ethics Seminar**		
***During week 16 you will have your final examination which is cumulative of all work**		

Grading Policy

Written Examinations (10 pts x 4) = 40%
Classwork/Assignments and Case Reviews = 30%
End-of Term Ethics Debate Presentation = 10%
Final Examination = 20%

Total = 100 points

There are no make-up examinations without written documentation. A missed examination will be assigned a grade of zero. In accordance with KCC's Attendance Policy, excessive absences will result in course grade reduction. • **Two latenesses are equivalent to one absence.** • In accordance with the college's policies on academic integrity, any student identified participating in cheating; plagiarism, etc. will be subjected to disciplinary actions. Utilization of any mobile or electronic devices is prohibited during lecture and examinations.

Final Examination

The final examination is cumulative; you must review the entire term's work.

Plagiarism & Cheating

Any form of academic dishonesty will be handled in accordance with Kingsborough College Now policy and the policy of New Dorp High School. Consequences for academic dishonesty can range from failing grades for individual assignments to potentially failing the course as a whole (which will be recorded on the students' permanent record and transcripts).

Accessibility

Access-Ability Services (AAS) serves as a liaison and resource to the KCC community regarding disability issues, promotes equal access to all KCC programs and activities, and makes every reasonable effort to provide appropriate accommodations and assistance to students with disabilities. Please contact this office if you require such accommodations and assistance. Your instructor will be glad to make the accommodations you need, but you must have documentation from the Access-Ability office for any accommodations.
I accept the guidelines of the Class Contract for BIO37. Any concerns I have within this class will be discussed with my instructor as soon as an issue presents itself.

Equity Statement

In an ideal world, science would be objective. However, much of science is subjective and is historically built on a small subset of privileged voices. I acknowledge that much of scientific research and publications have been the work of white men. With that in mind, I have tried to select topics and activities that broaden the voice of science as well as consider and respect difference. However, although I have tried to address inequities in science, there may be both overt and covert biases in the materials you read during the course. Please contact me if you have any suggestions to improve the quality of the course materials. One of my teaching goals is to create a learning environment 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:

- I will ask you to tell me the name and/or set of pronouns you would like me to use to address you.
- I want to be a resource for you. If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to connect with me to talk about it.
- Like so many people, I am still in the process of learning about diverse perspectives and identities. I will make mistakes!

Acknowledgement: I have read and understand the course requirements as outlined in this syllabus. Please complete the following google doc to acknowledge receipt.

Syllabus Receipt Form