

OAKTON COMMUNITY COLLEGE
Spring Semester, 2012

CLASS SYLLABUS

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I.	<u>Course Prefix</u>	<u>Course Number</u>	<u>Section Number</u>	<u>Course Name</u>	<u>Credit</u>	<u>Lecture</u>	<u>Lab</u>
	BIO	104	002	Human Genetics (non-lab course)	3	3	0

II. Prerequisite: None

III. Course Catalog Description:

Course introduces basic genetic principles and applications in human populations. Content includes cell cycle; structure, function, mutation and transmission of the genetic material; role of genetics in health care and biotechnology; and ethical, psychological and social implications of gene-based medicine.

IV. Biology Department Learning Outcomes:

By the completion of your biology courses at Oakton, you will have gained the experience to:

- A. think critically – identify, define, analyze, interpret, and evaluate ideas, concepts, information, problems, solutions, and consequences. This includes the ability to compute and comprehend quantitative information and to engage in the scientific process.
- B. communicate – communicate ideas, concepts, and information through written and oral means. Collaborate with people of diverse backgrounds and abilities.
- C. demonstrate literacy – demonstrate the ability to read critically within content areas. Use technology to locate, evaluate, and communicate data, information, ideas, and concepts. Assess, critique, and select from a variety of information resources.
- D. demonstrate responsibility – demonstrate an understanding of personal responsibility and ethical behavior in one's own academic and civic life.

V. Course Learning Objectives:

After successfully completing this course, students should understand and be able to:

- A. use critical thinking skills to evaluate advances in genetics.
- B. describe the basis of DNA replication, transcription, and translation.
- C. describe the regulation of gene expression.
- D. describe mutations, mutagenic origins and agents and their effect on cells, individuals and populations, including inborn errors of metabolism.
- E. describe and explain the stages of the cell cycle.
- F. describe and explain the stages of mitosis.
- G. describe and explain the genetic significance of meiosis.
- H. work monohybrid and dihybrid Mendelian crosses and sex linkage problems.
- I. explain human cytogenetics, including the normal karyotype and chromosome abnormalities.
- J. describe the genetic basis of gender.
- K. describe the effect of mitochondrial inheritance and multifactorial genetics.
- L. discuss the role of genetics in cancer.
- M. discuss the importance of genetic considerations in risk assessment, prevention, diagnosis, management and treatment of human disease.
- N. discuss the medical applications of genetic technologies, including reproductive technologies.
- O. discuss contemporary issues in genetics, including ethical, legal and social implications.

VI. Academic Integrity:

Students and employees at Oakton Community College are required to demonstrate academic integrity and follow Oakton's Code of Academic Conduct. This code prohibits:

- cheating;
- plagiarism (turning in work not written by you, or lacking proper citation);
- falsification and fabrication (lying or distorting the truth);
- helping others to cheat;
- unauthorized changes on official documents;
- pretending to be someone else or having someone else pretend to be you;
- making or accepting bribes, special favors, or threats; and
- any other behavior that violates academic integrity.

There are serious consequences to violations of the academic integrity policy. Oakton's policies and procedures provide students a fair hearing if a complaint is made against you. If you are found to have violated the policy, the minimum penalty is failure on the assignment. In addition, a disciplinary record will be established and kept on file in the office of the Vice President for Student Affairs for a period of 3 years.

Details of the Code of Academic Conduct can be found in the Student Handbook.

VII. Instructional Materials:

Lewis, Human Genetics - Concepts and Applications, McGraw Hill, 2010, 9th ed.
Supplemental readings may be assigned by the instructor.

VIII. Methods of Instruction:

Lecture material is presented in lecture-discussion format. Students are expected to participate by asking questions, by responding to questions asked of them and by performing problem-solving exercises. Visual aids are often used.

IX. Course Practices Required:

- A. Attend **ALL** lectures and arrive **ON TIME**. You are expected to explain any unavoidable absence to the instructor. Explain any anticipated absence **IN ADVANCE**.
- B. Read the assigned lecture materials **BEFORE** the relevant lecture.
- C. Be an active participant in classroom discussion.
- D. Take careful, thorough notes.
- E. Complete all in-class exercises and present them in a neat and clear format. All out-of-class work must be **TYPED** and presented in a neat and clear format. Work that does not meet the instructor's standards, or that is submitted after its due date, or that is submitted in electronic format will **NOT** be accepted.
- F. The instructor is **NOT** responsible for contacting you if you miss a class during which homework is assigned or the exam schedule is revised.
- G. During exams, remain in your seat at all times. You may not leave the room for any reason.
- H. The use of cell phones and pagers is **STRICTLY PROHIBITED**. Turn them off!
- I. The use of programmable calculators is **STRICTLY PROHIBITED**.
- J. The use of audio-recording or image-capturing devices is **STRICTLY PROHIBITED**.
- K. The use of laptop computers is **STRICTLY PROHIBITED**.
- L. Devices used in violation of this section become the property of the instructor.

X. Lecture Schedule, Topics and Readings:

Introduction: Cells, Genes and Chromosomes	Chapters 1 (2-5) and 2 (to 31)
The Cell Cycle: Interphase	Chapter 2 (to 31)
DNA Structure and Replication	Chapter 9
Gene Expression and Regulation	Chapter 10
EXAM I	February 10
Gene Mutation	Chapter 12
The Cell Cycle: Mitosis and Meiosis	Chapters 2 (from 31) and 3 (46-53)
Cytogenetics	Chapter 13
Sex Determination	Chapter 6
Mendelian Inheritance	Chapter 4
EXAM II	March 9
Extensions of and Exceptions to Mendelian Inheritance	Chapter 5 (to 102)
Mitochondrial Inheritance	Chapter 5 (to 102)
Multifactorial Genetics	Chapters 7 (to 146) and 8 (Summary)
Population Genetics: Allele Frequencies	Chapters 14 and 15
Population Genetics: Evolution	Chapter 16 (from 316)
EXAM III	April 20
Developmental Genetics	Chapter 3 (from 60)
Immunogenetics	Chapter 17 (333-336, 341-343)
Cancer Genetics	Chapter 18
Clinical Genetics and Genetic Counseling	Chapter 20
Biotechnology and Genetic Medicine	Chapters 19 and 21
Genomics	Chapter 22 (Summary)
EXAM IV	May 11

XI. Method of Evaluating Student Progress:

3	100 point lecture exams	300 points	(There are actually 4 lecture exams. The lowest score exam is dropped when calculating total points.)
4	In-class exercises	100 points	
4	Homework assignments	<u>100 points</u>	
Total		500 points	

Grades are based on total points earned, where:

A = 450-500 B = 400-449 C = 350-399 D = 300-349 F = fewer than 300

YOU WILL NOT BE PERMITTED TO MAKE UP EXAMS OR IN-CLASS EXERCISES. IF YOU MISS THE FINAL IN-CLASS EXERCISE OF THE SEMESTER, YOUR TOTAL POINT SCORE FOR THE CLASS WILL BE REDUCED BY 25 POINTS.

No extra credit is accepted in lieu of or in addition to the regular course requirements. There are absolutely **NO EXCEPTIONS** to this rule.

Borderline grades may be boosted by participation, attitude and progressive improvement over the length of the course.

You cannot take an “Incomplete” in this course.

XII. Other Course Information:

The exam schedule is tentative and may change as conditions dictate. If necessary, a corresponding change will be made to the method of evaluation.

If religious observance interferes with your adherence to this schedule, it is your responsibility to inform me in writing by **January 20, 2012**, indicating the date(s) of any class(es) you will miss.

If you are struggling with this course, please see me during my office hours and take advantage of Learning Center services.

If you have a documented learning, psychological, or physical disability you may be entitled to reasonable academic accommodations or services. To request accommodations or services, contact the ASSIST office in the Learning Center. All students are expected to fulfill essential course requirements. The College will not waive any essential skill or requirement of a course or degree program.

Important Dates:

February 12	Last day to withdraw and have class dropped from record
February 12	Last day to change to Audit
February 20	Holiday - College closed
March 11	Last day to withdraw from class with a “W”
March 12-18	Spring Break