

**LEWIS-CLARK STATE COLLEGE**

**Division of Nursing & Health Sciences  
Division of Natural Sciences & Mathematics**

**ID 307**  
Section 7001  
Genetics for the Health Sciences

Fall 2008

Faculty: Sheila Watkins, PhD., RN  
Jacob Hornby, Ph.D.

**American Disability Act Statement:**

If you need course adaptations or accommodations because of a disability, if you have emergency medical information to share with me, or if you need special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible.

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**Course Number:** ID 307

**Course Title:** Genetics for the Health Sciences

**Credits:** 3

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**Course Description and Purpose:** Explores the biological basis of patterns of human genetic inheritance, DNA and RNA replication, mechanisms of cell division, and current implications of genetic topics related to health care. Genetic counseling/referrals and the legal/ethical concerns of genetic manipulation and current genetic interventions with requisite medical and nursing care are reviewed.

**Pre-requisites:** BIOL 180 or BIOL 253; CHEM 105; and core math all with a grade C or better.

**Course Competencies:**

1. Apply a critical thinking approach to the topics of cell reproduction, DNA and RNA replication, and the process of DNA mutation.
2. Compare and contrast the principles of Mendelian and other inheritance patterns.
3. Discuss the genetic basis of cancer and other disease processes and appropriate client teaching.
4. Explore the principles of population and evolutionary genetics.
5. Perform a genetic assessment and counsel plan demonstrating respect for human diversity.
6. Debate legal and ethical implications of genetic manipulation.
7. Examine the health care needs of individual across the lifespan who have had gene therapy interventions.
8. Demonstrate therapeutic communication as a caring tool to help people make difficult decisions related to child bearing and personal health care choices when the genetic assessment is not favorable.

**Required Texts:** Lewis, R. (2008) Human genetics: Concepts and applications (8<sup>th</sup> ed.). New York: McGraw Hill.

**Additional readings from journals and other texts will be assigned as announced during the course – see website.**

**Method of Instruction:**

Group work  
Lecture – taped online  
Discussion -- online  
Role playing  
Videos – on reserve in the library  
Power Point  
Blackboard

**Method of Evaluation:**

Quizzes            One                            12 points

	Two	12 points
	Three	12 points
	Four	12 points
	Five	12 points
Exams:	One	110 points
	Two	110 points
Paper on ethical implications		80 points
Discussions/assignments as assigned		5 points each for a total of 30 points
<b>Comprehensive Final</b>		<u>110 points</u>
<b>Total</b>		<b>500 points</b>

**College Grading Scale:**

GRADE	QUALITY POINTS	PERCENTAGE
A	4.00	93
A-	3.67	90
B+	3.33	87
B	3.00	83
B-	2.67	80
C+	2.33	77
C	2.00	73

**Criteria for Paper:**

On Nov. 17 you will submit a paper dealing with the ethical implications of one of the following topics:

1. Choosing to abort a child that would have a genetic illness that would cause the child pain and a shortened life span (you choose the specific illness).
2. Choosing to have a double mastectomy to prevent breast cancer if you have the genes making you a high risk for breast cancer, or choosing not to have it. You may also choose to have a bilateral oophorectomy or not for prophylactic purposes because of being BRCA1 and BRCA2 positive.
3. Why do all states mandate the testing of all newborns for PKU disease, a genetic disorder, but not all of them mandate testing for Tay-Sachs, cystic fibrosis, or sickle cell anemia? Is it less beneficent, less just? Should the parents have autonomy to ask for testing in regards to some diseases and not for others?

You need to read at least four journal articles that will help you develop your reasoning. You need to deal with ethical principles such as beneficence, nonmaleficence, justice, and autonomy. We will discuss these principles in class, and you must apply them in the paper. What issues are involved in the choices? What are possible good and possible harmful outcomes of the choices? You will be graded as follows:

<u>Discussion of the ethical principles and issues involved.....</u>	<u>40 points</u>
Inclusion of evidence from the literature .....	30 points
Proper grammar and APA format .....	<u>10 points</u>

Total: 80 points

**Course Expectations**

This course is a 300 level science course and does require two to three hours of study per course credit. Therefore you should expect to study twelve to eighteen hours per week for this course. This includes reading the text and any assigned articles, studying the online lecture notes/learning module, reviewing the notes for exams, doing any assigned role playing, etc.

Additionally, we expect you to participate in the online discussions and assignments. These are prepared to enhance your learning as well as to allow you to interact with other students in the class. This way you do not feel like you are out there all alone learning genetics. You are not alone, and if you want to get together with the other students to study, that is highly encouraged. Just because you are taking this class as an online class does not mean that you have to feel like an island out in the blue. Also feel free to e-mail the instructors if you have questions about the material that you need answered. Do not wait until you are drowning before you get help.

Access to high speed internet will facilitate a quality learning experience for this course. If your own computer does not qualify, make sure you have access to one that does.

Judicial Affairs:

"Cheating or plagiarism in any form is unacceptable. The College functions to promote the cognitive and psychosocial development of all students. Therefore, all work submitted by a student must represent his/her own ideas, concepts and current understanding."

If you suspect a student has committed an act of academic dishonesty, document the incident and notify the Judicial Affairs Officer in Reid Hall 111, phone 2211.

## Topical Outline:

Week	Topic	Assigned Reading	Clinical Competency
1/ Aug. 25	Intro to Human Genetics Nursing Roles “Genetic Counseling” video	Lewis Chapters 1 Pgs. 398-402 in Lewis	Participate in genetics continuing education.
2/Sept. 1	Labor Day – no class		Review mitosis and Meiosis from A & P
3/ Sept. 8	Cellular Reproduction Single Gene Inheritance “Curing Cancer” Video	Lewis, Chapters 2 & 3 Lewis Chapter 4  Lewis Chapter 21	Assist persons, families, groups with interpretation of and decision making related to genetic information.
4/ Sept. 15	<b>Online Quiz 1 Open Friday, Sept. 12 at 7 PM through Monday, Sept. 15 at 5 PM</b> Single Gene Inheritance, cont. Genetic Counseling (detail for CF and DMD) <b>Discussion One due Friday, 9/19</b>		
5/ Sept. 22	<b>Exam 1 Monday ( take in class at 1:30) class ends after the exam – rest of class on blackboard</b>  Genome Testing – lecture content is testable material; pedigree assignment for five points	All the genome lecture information on blackboard. Genome card on Blackboard.	Conduct genetic Assessment
6/ Sept. 29	Beyond Mendel Genetics of Behavior <b>Discussion two due Friday Oct. 3</b>	Lewis Chapter 5, 8, and 19	
7/ Oct. 6	<b>Online Quiz 2 Open Friday 10/3 at 7 PM through Monday 10/6 at 5 PM</b> Matters of Sex Genetic basis of Immunity – holistic view – part 1 <b>Pedigree due Friday Oct. 10</b>	Lewis Chapter 6  Lewis Chapter 17	Continuing education and genetic counseling
8/Oct. 13	Multifactorial Traits Genetic basis of Immunity – holistic view – part 2	Lewis, chapter 7	
9/ Oct. 20	<b>Online Quiz 3 Open Friday 10/17 at 7 PM through Monday 10/20 at 5 PM</b> DNA Structure “Secret of Life” Video <b>OJIN discussion (3) due Friday 10/24</b>	Lewis Chapter 9  Lewis Chapter 18	Continuing education and genetic counseling
10/Oct. 21	DNA Replication Genetic basis of Cancer		

11/ Oct. 28	<b>Exam 2 Monday (take in class at 1:30 – class ends after exam and rest of class material will be on blackboard.)</b> Gene Action	Lewis Chapter 10	Continuing education, genetic counseling, identify person or groups who may benefit from services.
12/Nov. 3	Genetics of heart disease and Alzheimer’s – holistic approach “Playing God” video <b>Discussion 4 due Friday 11/7</b>		
13/ Nov. 10	<b>Online Quiz 4 Open Friday 11/7 at 7 PM through Monday 11/10 at 5 PM</b> Gene Mutation Working with children with Down’s syndrome and other mentally challenged children <b>Assignment on genetic tests due Friday 11/22</b> <b>Ethics paper due Nov. 17</b>	Lewis Chapter 12 Videos for challenged children	Use health promotion and disease prevention techniques shown to alter phenotypical expression of genes.
14/Nov. 17	Chromosomes Gene Therapy	Lewis Chapter 13 & 20	
Nov. 24-29	<b>Thanksgiving Break</b>		
15/Dec. 1	<b>Online Quiz 5 Open Friday 11/28 at 7 PM through Monday 12/1 at 5 PM</b> Population Genetics Evolution and Eugenics “Pandora’s box” video	Lewis Chapter 14/15 Lewis Chapter 16 & 22	Participate in genetics continuing education
16/Dec. 8	Pharmacogenetics Review for final exam	Assigned readings	
Dec. 15	<b>Exam 3 (Final) Take in classroom at 1:30 on Monday</b>		.

Clinical competencies cited from Jenkins, J.F., Prows, C., Dimond, E., Monsen, R., and Williams, J. (2001). Recommendations for educating nurses in genetics. *Journal of Professional Nursing*, 17 (6) 287.

