Introduction

The purpose of this course is to introduce you to some of the major concepts in human genetics. In the lecture portion of this course we will be studying various genetic topics – while in lab you will gain hands-on experience to topics that will reinforce what was learned in class. Lecture and lab are designed to complement each other and together will give you a greater understanding into the world of human genetics.

Course Objectives

After completion of this course your should be able to:

• Understand principles of transmission genetics including pedigree analysis.
• Learn about chromosomes through the use of cytogenetics including karyotyping.
• Understand the principles of molecular genetics including recombinant DNA technology and DNA fingerprinting.
• Understand the principles of population genetics and how it relates to evolution of species.
• Understand how the above areas of genetics applies to you.
**Course Information**

Human Genetics is a four-unit course that includes both lecture and lab.

**Prerequisites:**
There are no prerequisites for this course as it is an entry-level science course. However, you are expected to read and write at the college level and be able to read graphs and charts.

**Attendance:**
One of the most important things you can do for your understanding of the material as well as your grade is to attend class. Not attending class will have a negative impact on your grade! You may not “make-up” a missed class. For any classes missed, you are responsible for any notes, assignments, or reading (hint: make a friend in class). If you know in advance that you will miss a class, get class information before hand. If you miss more than 4 classes during the semester, I will suggest that you drop the course and take it another semester.

**Tardiness:**
The class will start on time. If you do come to class late, please be quiet and courteous to those around you. Any handouts missed can be obtained after class.

**Cell Phones:**
Cell phones must be turned off during class as this is extremely distracting.

**Website:**  [http://instruct.westvalley.edu/schrey/](http://instruct.westvalley.edu/schrey/)
You will be required to access my website for class handouts, study guides, class notifications, and other class information. If you do not have access to a computer and printer you can use the Technology Center here on campus with your I.D. card and a fee.

**Homework:**
Homework assignments will consist of reading, short written assignments, handouts, internet assignments and study guides (see below). Expect to spend between 5-7 hours studying outside of class each week

**Genetic Disorder Outline/Presentation:**
You will choose a specific genetic disease/disorder and prepare an outline and presentation on that topic. The outline/presentation will be worth 100 pts. A separate handout regarding this assignment will be given later.

**Exams:**
**Exams:** Three exams worth 100 points each will be given during the semester. A combination 4th exam and comprehensive final (150 points) will be given during final exam week. Exams will be announced at least one week prior to being given. No exams will be dropped. Make up exams are given for legitimate absences only. It will be given within one week of the missed exam. Sleeping late, transportation problems etc. are not legitimate excuses. If you are sick, a doctor’s excuse should be submitted.

**Study Guides:** Study Guides are optional but effective tools to help prepare for an exam. They are written out on separate sheets are worth up to 5 extra points toward the exam. You may work on study guides together however, each student must turn in their own work (no photocopies or double computer printouts). No other extra credit is given.
**Laboratory Requirements**

The purpose of this biology laboratory is to reinforce what you have learned in lecture and give you hands-on experience with scientific equipment and procedures. Lab is the participatory portion of your biology course and you are expected to be an active member of your lab group.

Lecture and lab are designed to complement each other but please be advised that due to time constraints, they may not exactly coincide with each other.

- The lab schedule needs to be somewhat flexible due to the nature and schedule of some of the living organisms we will be dealing with.
- Labs are only set up once and therefore cannot be made up. Your attendance is mandatory to get credit for the lab.
- You will take a quiz from the previous week’s lab at the beginning of each class.

**Grading: Lab**

- **Lab Reports/Lab Activities:** Lab Reports/Activities will be worth 10 points and will be graded on completeness and correct answers that are well thought out. Labs will be turned in the next lab period unless otherwise noted. No lab grades will be dropped.
- **Quizzes:** There will be a quiz for most lab topics/activities completed - quizzes will be given at the beginning of the following lab. Each quiz will be worth 20 points and may take the form of multiple choice, diagrams, charts, short answer or all of the above. Quizzes will be given at the beginning of class – so don’t be late. There are no make-ups but I will drop the lowest quiz grade.

**Helpful Suggestions:**

The following are suggestions from former students that are condoned by this instructor to help you improve your chances of getting a good grade:

- Don’t get behind in your studying
- Read topic information before and after lecture
- Do study guides as you get them
- Study with a friend or group, quiz each other or “teach” someone else
- Make sure you understand the topic, not just memorize facts
- Attend study sessions

**Important Dates**

- **Sunday, Sep. 13**  
  Last day to drop without a “W” and a refund
- **Saturday, Nov. 21**  
  Last day to drop with a “W”
- **Monday, Dec. 14**  
  Final Exam: 9:40 – 11:40

**Holidays**

- **Monday, Sep. 7**  
  Labor Day Holiday – No classes
- **Wednesday, Nov. 11**  
  Veteran’s Day – No classes
- **Nov. 26-28**  
  Thanksgiving Holiday
Final Grade:

Your final grade is determined through a combination of lecture and lab. Lecture is worth 2/3% of your grade while lab is worth 1/3%.

Lecture: your lecture grade will be determined by:
- 3 – 100 pt. classroom exams
- 1 – 150 pt. exam and comprehensive final one
- 1 - 100 pt. outline/presentation
- a few homework assignments throughout the semester.

Lab: your lab grade is a combination of
- Weekly lab reports (10 pts. each)
- Periodic lab quizzes (20 pts. each)

Range of Grades:  

- 90 - 100 ........... A
- 80 - 89 ........... B
- 65 - 79 ........... C
- 55 – 64 ........... D
- 54 and below ....... F

Exam Policies:
1. Be on time for the exam.
2. Bring all items needed for exam with you (e.g. 2 pencils with erasers, scantron sheet, completed study guide, drink, tissue etc.)
3. All books, backpacks, purses etc. will be placed in the front of the class and picked up after the exam. No items should be under your seat.
4. If space permits, students will alternate seats for exams.
5. Turn cell phones/pagers off during the exam and place in backpacks or purses.
6. You may not leave the exam room for any reason once the exam has started. Use the restroom before the exam. Once you leave the room, I will grade what you have completed up to that point.
7. Once the 1st person leaves the exam room, no latecomers will be admitted to the exam.
8. Cheating will result in a zero on the exam and probable expulsion from the class.
9. Make-up exams are for emergencies only. You must call the day of the exam to let me know of your situation.
10. Make-up exams are in all-essay form and will be given within 1 week of the missed exam.
11. Do not schedule appointments etc. during an exam or any class time.

Student Learning Outcomes:
1. Describe the basic mechanism of inheritance for a specific genetic disease.
2. Hypothesize and evaluate the validity of a genetic inheritance model for an observed phenotype of a given population.
3. Describe basic principles of biotechnology such as cloning, recombinant DNA, and DNA profiling.
**Student Attendance Policy** (from the WVC Catalog, p. 194)
Students are expected to attend all sessions of each class. Instructors may drop students from the class if they fail to attend the first class meeting, or when accumulated unexcused hours of absences exceed ten percent of the total number of hours the class meets during the semester. Moreover, an instructor may drop from the class any student who fails to attend at least one class session during the first three weeks of instruction.

**Drop Policy**
Students are responsible for dropping a class and must fill out the appropriate paperwork by the above deadline to officially drop the course.

**Unlawful Discrimination/Sexual Harassment**
If you have a complaint or someone has shared information with you as a student or employee that is unlawful discrimination or sexual harassment, contact the Associate Vice Chancellor of Human Resources at West Valley-Mission Community College District, Human Resources Department, (408-741-2060). If the Associate Vice Chancellor of Human Resources is not available, contact the President of the college in which you attend or are employed. For West Valley College, contact the office of Bradley Davis (President) at 408-741-2097.

**Special Needs**
West Valley College makes reasonable accommodations for persons with documented disabilities. Students should notify DESP (Disability & Educational Support Program) located in the Learning Services building (408-741-2010) of any special needs.

**Support Services**
The counseling office offers a wide variety of support services to help you through your college career. Services such as tutoring, short reading and writing skills classes, financial aid, programs in educational transition and help for disabled students are offered for your benefit.

**Academic Dishonesty**
West-Valley College (and this instructor) has a strict no cheating policy. Students found cheating on class examinations, quizzes or homework may be expelled from this class.

**Safety Issues**
Though West Valley College is considered a very safe school being prepared in the event of an earthquake or other incident is always a good idea. The college recommends that you keep a small flashlight handy in the event of a power failure, as the rooms are extremely dark.

For emergencies please note the following numbers and locations:

- Life threatening emergency – regular phone 911
- Life threatening emergency – campus phone 9-911
- Student Health Services on campus 2222
- Safety escort services on campus 2092
- Nearest accessible campus phone (SM division office) 2018
- Nearest public phone (next to campus sign north of biology wing) 741-9008
- Nearest fire alarm Front of room
- Nearest fire extinguisher Front of room

In the event of an emergency that requires the evacuation of the room, exit the back doors of the room, proceed north along the east wall of the Biology wing towards the parking lot and meet at the campus map sign north of the Biology wing for roll call and further instructions.
## COURSE OUTLINE

The following lecture/lab schedule is subject to change.

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>M: 8/31</td>
<td>Class Outline, Introduction, Cell Structure and Function</td>
<td>Ch. 1, 2</td>
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<tr>
<td>W: 9/2</td>
<td><strong>Lab:</strong> Microscopes</td>
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<tr>
<td>M: 9/7</td>
<td><strong>LABOR DAY – NO SCHOOL</strong></td>
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<tr>
<td>W: 9/9</td>
<td>Cell Cycle, Cell Division (mitosis, meiosis, gametogenesis)</td>
<td>Ch. 2</td>
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<tr>
<td>M: 9/14</td>
<td><strong>Lab:</strong> Cell Division: Mitosis/Meiosis</td>
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<tr>
<td>W: 9/16</td>
<td>Mendelian Genetics</td>
<td>Ch. 3</td>
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<tr>
<td>M: 9/21</td>
<td><strong>Lab:</strong> Genetic Corn, Chi-square Analysis,</td>
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<tr>
<td>W: 9/23</td>
<td><strong>Lab:</strong> Fruit Fly Crosses (Review for exam)/ Pedigree Analysis</td>
<td>Ch. 4</td>
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<tr>
<td>M: 9/28</td>
<td><strong>Exam #1: Ch. 1-3</strong></td>
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<tr>
<td>W: 9/30</td>
<td>Sex Linked Traits <strong>Lab:</strong> Human Characteristics, Pedigree Analysis</td>
<td>Ch. 4</td>
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<tr>
<td>M: 10/5</td>
<td>Linkage <strong>Lab:</strong> Linkage, Gene mapping</td>
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<tr>
<td>W: 10/7</td>
<td>Complex Patterns of Inheritance <strong>Lab:</strong> Fingerprint Ridge Count</td>
<td>Ch. 5</td>
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<tr>
<td>M: 10/12</td>
<td>Cytogenetics, Development</td>
<td>Ch. 6, 7</td>
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<tr>
<td>W: 10/14</td>
<td>Sex Determination, <strong>Lab:</strong> Karyotyping</td>
<td>Ch. 7</td>
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<tr>
<td>M: 10/19</td>
<td>DNA Structure &amp; Chromosomal Organization</td>
<td>Ch. 8</td>
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<tr>
<td>W: 10/21</td>
<td><strong>Exam #2: Ch. 4-7</strong> [Assign Outline]</td>
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<tr>
<td>M: 10/26</td>
<td>Gene Expression <strong>Lab:</strong> DNA and Gene Expression</td>
<td>Ch. 9</td>
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<tr>
<td>W: 10/28</td>
<td>Mutations, Cancer</td>
<td>Ch. 11, 12</td>
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<tr>
<td>M: 11/2</td>
<td>Cloning, Recombinant DNA</td>
<td>Ch. 13</td>
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<tr>
<td>W: 11/4</td>
<td>Biotechnology <strong>Movie:</strong> Cracking the Code of Life</td>
<td>Ch. 14</td>
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<tr>
<td>M: 11/9</td>
<td><strong>Lab:</strong> Recombinant DNA and Bacterial Transformation</td>
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<tr>
<td>W: 11/11</td>
<td><strong>VETERAN’S DAY – NO SCHOOL</strong></td>
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<tr>
<td>M: 11/16</td>
<td>Genomics <strong>Lab:</strong> DNA Fingerprinting (paper lab) [Choose Outline Topic]</td>
<td>Ch. 15</td>
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<tr>
<td>W: 11/18</td>
<td><strong>Lab:</strong> DNA Fingerprinting/Electrophoresis (Kit) Immune System</td>
<td>Ch. 17</td>
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<tr>
<td>M: 11/23</td>
<td><strong>Exam #3: Ch. 8, 9, 11, parts of 13-15</strong> [Topic Sheet Due]</td>
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<tr>
<td>W: 11/25</td>
<td>Genetics: Immune System, cont’d, <strong>Lab:</strong> ELISA Immuno Explorer Kit</td>
<td>Ch. 17</td>
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<tr>
<td>M: 11/30</td>
<td><strong>Lab:</strong> Blood Typing Kit, Population Genetics</td>
<td>Ch. 19</td>
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<tr>
<td>W: 12/2</td>
<td>Population Genetics cont’d, <strong>Movie:</strong> the Black Death</td>
<td>Ch. 19</td>
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<tr>
<td>M: 12/7</td>
<td>Presentations: Group #1 [Outlines Due w/ presentation]</td>
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<tr>
<td>W: 12/9</td>
<td>Presentations: Group #2 [Outlines Due w/ presentation]</td>
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**Final Exam:** Ch. 17,19 AND Cumulative Final: **Monday, Dec. 14; 9:40 – 11:40** SM 52