

## BIOLOGY 321 GENETICS Spring 2013 MWF 11:30-:1250 pm in CF25

Dr. Carol Trent trent@biol.wvu.edu

Office BI 408 **Office Hours: M & W 2:30 - 4:00 pm**

OR contact me via email to set up an appointment at an alternative time.

**COURSE WEB SITE** <http://fire.biol.wvu.edu/trent/trent/Biol321index.html>

This class meets three days a week for 80 minutes. Typically, 45 minutes a week will be set aside for **informal** discussion(s) of the lecture material and problem sets. These informal sessions may consist of one longer or 2 shorter sessions.

LECTURE DATE	COURSE TOPICS
	<b>The lecture schedule may change without prior notice</b>
<b>Week 1</b> April 3 & 5	Introduction to Biol 321 Mendel & Model organisms; Probability
<b>Week 2</b> April 8, 10 & 12	Mendel & Meiosis Morgan & Sex-linkage; Intro to pedigrees <b>Fri April 12: QUIZ 1 (25 pts.)</b>
<b>Week 3</b> April 15, 17 & 19	<b>Independent Study on Pedigree analysis: come to class on 4/15 prepared to analyze pedigrees – see details in Assignment Set 2</b> Pedigrees and more probability Start complications to Mendelian analysis
<b>Week 4</b> April 22, 24 & 26	Polymorphisms <b>Wed April 24: QUIZ 2 (45 pts.)</b> Additive Gene action & start gene interactions
<b>Week 5</b> April 29 & May 1 & 3	Complementation and genetic heterogeneity Epistasis and Suppression The complicated relationship between genotype and phenotype
<b>Week 6</b> May 6, 8 & 10	Molecular genetics: the fidelity of DNA replication The molecular basis of mutation <b>Wed May 8: Midterm Exam (90 pts.)</b> Review of gene structure
<b>Week 7</b> May 13, 15 & 17	<b>Independent Study on effects of mutation at the protein level: come to class on May 13 prepared to discuss terms listed in Assignment Set 6</b> Effects of mutation on gene function <b>Wed May 15: QUIZ 3 (25 pts. take-home quiz distributed)</b> Cancer genetics
<b>Week 8</b> May 20, 22 & 24	PCR & Direct detection of mutation <b>Wed May 22: QUIZ 3 due</b> Human Genome structure & DNA fingerprinting Genetic linkage and recombination
<b>Week 9</b> Memorial Day Holiday May 29 & 31	The generation of a genetic map & Positional cloning <b>Fri May 31: QUIZ 4 (25 pts.)</b>
<b>Week 10</b> June 3, 5 & 7	Multifactorial inheritance and Complex traits Epigenetics, gene function and phenotype
Finals Week	<b>Final Exam 90 pts on Tues June 11 10:30 am</b>

## CONTENT GOALS FOR BIOLOGY 321

*You should acquire in-depth knowledge of classical and molecular genetics by*

- learning the basic principles of classical and molecular genetics and how they are applied to the study of biological processes
- integrating your understanding of these genetic principles with knowledge from other biological disciplines
- developing a thorough knowledge and understanding of the vocabulary of genetics
- studying special topics in genetics and genomics and relevant current research

## PROCESS GOALS FOR BIOLOGY 321:

*You should become a sophisticated and critical consumer of scientific information in general and genetic information in specific by:*

- developing your analytical and quantitative reasoning skills with problem solving and data analysis
- increasing the level of sophistication of your reading comprehension and attention to detail especially with respect to the presentation of scientific data and experimental design in genetics
- developing your written and oral communication skills by discussing biological processes (in class and with your fellow students) using precise scientific terminology.

## REQUIRED TEXT

The 10<sup>th</sup> edition of *Introduction to Genetic Analysis* by Griffith and others

## READING ASSIGNMENTS AND PROBLEM SETS

Each week or so you will receive a reading and problem set assignment. **THESE ARE STUDY PROBLEMS TO PREPARE YOU FOR QUIZZES AND EXAMS. YOU ARE NOT TO HAND IN THE ANSWERS** to these questions. After reading through the assigned material, work through the assigned problems at the end of the chapter and the additional problems handed out in class. The answers to the problems will be available online at the Biology 321 web site. Try writing out the answers yourself *before* checking the posted answers. Make sure that you understand the genetic principles underlying the answers. *We will review some of the assigned problems in the informal discussion sessions.* [See also quizzes and exams from Winter 2010.]

## EVALUATION

Mid term and Final Exams: 2 @ 90 pts.....	180
Quizzes: 3 x 25 pts, 1 X 45 pts. ....	120
Google.doc questions on required extra reading: .....	35
Total Points:	335

→ Grading Correction = 5 pts (see explanation below)

→ Extra Credit Option = up to 6 pts (see explanation below)

### QUIZZES & EXAMS

- I have scheduled midterm and final exams and four quizzes. To get an idea of the types of questions and problems you will be responsible for, see the link to quizzes and exams from previous quarters.
- Make-up exams or quizzes will only be given if you are excused ahead of time. In other words, to take an exam or quiz at an alternative time, you must make arrangements with me BEFORE the scheduled exam period. In the event of an illness, you must have a note from a health professional indicating that you were too sick to take the exam during the scheduled period. The "self-described" illness form from the Student Health Center will not serve as a substitute for a note from a health professional.

### REQUESTS FOR REGRADES OF QUIZZES AND EXAMS

- Requests for regrades of exam and quiz questions must be submitted as written requests within one week of the return date of the graded exam/quiz. If you submit a request for a regrade of any question, I will reexamine your entire exam.
- Inquiries or concerns about arithmetic errors in point totals or obvious mis-marks (ie. on multiple choice questions, etc.) do not require a written request for correction.
- *See also info on automatic grading correction in next section*

### AUTOMATIC GRADING CORRECTION

→ At the end of the quarter, 5 points will be automatically added to your point total to correct for grading inaccuracies. *You will forfeit these 5 points if you request any quiz or exam regrades during the quarter.*

→ NOTE: Inquiries or concerns about arithmetic errors in point totals or obvious mis-marks *will NOT result in forfeiture* of the correction points.

### EXTRA CREDIT OPTION

- Extra credit is available for up to a total of 6 pts.
- You have an opportunity each week to submit via an electronic form a synopsis of a major-media, legitimate science article concerning genetics. ***This genetics research discovery/story must have been published in the past 6 months in a scientific journal (such as Science or Nature) or a major newspaper.***
- ***Each submission is worth two points.*** You can only submit ONE and only ONE story in a given week – up to 3 submissions in three different weeks. A “week” is defined by Sunday 12:01AM through Saturday 12:00PM.
- All submissions must be via the electronic form you will find at the link on the 321 web site. You must write the synopsis of the research discovery/story yourself; *if you cut and paste text from the original source this will result in a loss of ALL extra credit. Plagiarism is ASTONISHINGLY easy to check.*
- You will see a ***dialog box that verifies*** the submission when the form has been successfully sent. Unless otherwise notified (within 1 week of submission), 2 extra credit points will be added to your total grade.

- It is your responsibility to keep count of points earned. Absolutely NO HAGGLING for extra credit will be permitted. Any unseemly haggling will result in forfeiture of ALL extra credit.

<b>CLASS PARTICIPATION AND THE 3 X 5 CARDS THAT YOUR INSTRUCTOR CARRIES WITH HER</b>
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- ***No points are allocated specifically for class participation BUT: if you have a borderline grade at the end of the quarter, and you attended lectures consistently, were an active class participant and your performance on quizzes and exams has steadily improved, I will “bump” you up to the higher grade. A borderline grade means that you were within 1 percentage point of the grade cutoff.***
- To help me learn who you are and to encourage student participation during lecture, I will call on students (at random) using a deck of 3X5 cards. Each card has the name of a student and his/her photo. When I call your name, you will automatically get a check mark (✓) if you are in attendance. You will then be responsible for addressing whatever question is at hand.

***Options for responding to the question***

1. Always best: a correct or mostly correct answer (✓ another check mark)
2. Also OK: a serious but incorrect answer – which often can be a useful starting point for a discussion (✓ also gets a check)
3. Another option: decline and wait for a different question later in the lecture (no check mark but no black mark either...)

***Best approach—try to answer question even if you are unsure of your answer. At the end of the quarter, students who have lots of check marks will be considered good class participants***

<b>ACADEMIC HONESTY POLICY AND PROCEDURE</b>
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See Appendix D of the current Catalog

[http://www.wvu.edu/wwu\\_catalog/index.shtml](http://www.wvu.edu/wwu_catalog/index.shtml)