

# **BIOL 2416: GENETICS**

**CRN 14117**

Summer I 2017

CREDIT: 4 semester hours

**Tuesdays & Thursdays 12 Noon – 4:00 PM in SBC 515 (lecture)**

**Mondays & Wednesdays 12 Noon – 4:00 PM in SBC 529 (lab)**

**Fridays 12 Noon – 4:00 PM in SBC 529 (lecture)**

**Dr. P. Sen**

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**COURSE DESCRIPTION:** Study of the principles of molecular and classical genetics and the function and transmission of hereditary material (DNA). Will include genetic engineering (manipulation of DNA in the lab to produce a useful product). May include population genetics (study of genetic variation within populations)

**PREREQUISITE:** Must qualify to take college-level reading and writing OR co-enroll in INRW 0420 (or ESOL 0360) as a co-requisite.

## **REQUIRED TEXT:**

Genetics, A conceptual Approach (Fifth Edition) by Benjamin A. Pierce  
ISBN-13: 978-1-4641-0946-1

**OFFICE HOURS:** By appointment and as announced.

## **STUDENT LEARNING OUTCOMES for the GCA (aligned with questions)**

SLO1: 1. Deduce information about genes, alleles, and gene functions from analysis of genetic crosses and patterns of inheritance. (3, 6, 10, 14, 16, 18)

SLO2: Describe the molecular anatomy of genes and genomes. (1, 8, 17)

SLO3: Describe the mechanisms by which an organism's genome is passed on to the next generation. (2, 7, 20, 22, 23)

SLO4: Describe the phenomenon of linkage and how it affects assortment of alleles during meiosis. (13, 24)

SLO5: Describe the processes that can affect the frequency of phenotypes in a population over time. (5, 9, 19)

SLO6: Compare different types of mutations and describe how each can affect genes and the corresponding mRNAs and proteins. (4, 11, 12)

SLO7: Apply the results of molecular genetic studies in model organisms to understanding aspects of human genetics and genetic diseases. (15, 21)

SLO8: Interpret results from molecular analyses to determine the inheritance patterns and identities of human genes that can mutate to cause disease. (25)

SLO9: Describe the molecular basis of replication, transcription and translation in Eukaryotes and Prokaryotes. (26, 27, 28)

**ATTENDANCE POLICY:** Please go over the attendance policy of HCCS handbook. *“Students are expected to attend classes regularly. Students are responsible for materials covered during their absences. Class attendance is checked daily by instructors. Although it is the responsibility of the student to drop a course for non-attendance, the instructor has full authority to drop a student for excessive absences. A student may be dropped from a course for excessive absences after the student has accumulated absences in excess of 12.5% of the hours of instruction (including lecture and laboratory time).”* I realize that sometimes outside circumstances can interfere with school, and I will try to be as accommodating as possible, but please be aware of the attendance policy.

**WITHDRAWAL POLICY:** Students wishing to withdraw from the class **MUST DO SO BY 06/26/2017**. You are responsible for withdrawing yourself from the class. **I DO NOT WITHDRAW STUDENTS, EVEN IF STUDENTS HAVE STOPPED COMING TO CLASS. DO NOT ASSUME THAT YOU WILL BE AUTOMATICALLY WITHDRAWN FROM THE CLASS JUST BECAUSE YOU HAVE STOPPED COMING TO CLASS.** Unless withdrawn, grades are calculated as stipulated in this syllabus. Missed exams, assignments etc. will result in a grade of ZERO. Beware that, as mandated by the Texas State Legislature, students who repeat a course for a third or more times may soon face significant tuition and fee increases at HCC and other Texas public colleges and universities. Please ask your Professor or Counselor about opportunities for tutoring or other possible assistance prior to considering course withdrawal or if you are not receiving passing grades.

**LAB NOTEBOOK:** You must maintain your own bound lab notebook in accordance with industry rules. The notebook **MUST** be brought to every lab session.

**LAB REPORTS:** You will have to write a formal lab report for most lab exercises based on the raw data recorded in your lab notebook. Beware lab exercises may take more than one lab session to complete. We will go over the lab report format in class. Although you may discuss data with your lab partner, each lab report must be an individual effort (NO copying) and must be turned in separately. The lab reports plus other assignments will total 5% of the course grade.

**LAB SAFETY:** All lab safety rules must be followed (we will go over them). Absolutely no kids, smoking, eating, or **drinking (including water!)** in lab.

**Cell phones/pagers must remain turned off while you are in class. No texting and browsing. You will be penalized for not following these rules.**

**GENETIC DISORDER SEMINAR:** Students will be required to present a 10 minute presentation on a genetic disorder of their choice on July 03, 2017. To avoid duplication of topics, or topics that are too broad, you must submit two potential seminar topics for

review by June 16, 2017. A one page summary is due on June 23, 2017. For full credit, you **must** include a minimum of five references from at least three different types of resources (book, popular magazine, scientific publication, newspaper, personal communication with an established scientist, or (reliable!) web source). The seminar will total 20% of the course grade.

**EXAMS:** The use of cell phones in any way is prohibited. All materials other than a **SMALL GREEN SCANTRON**, pencil, eraser, the exam, and – if permitted – a calculator, must be out of sight. Students coming late will NOT be given extra time to complete the exam. NO bathroom breaks during the exam – use the bathroom BEFORE you start. Exams will total 75% of the course grade.

**MAKEUP EXAMS** are up to the discretion of the instructor. There will be NO makeup exams for missed exams involving **AN UNEXCUSED ABSENCE (NO-SHOWS WITHOUT PRIOR NOTIFICATION AND WITHOUT DOCUMENTED EXCUSE)**. Makeup exams will likely take place in TCSC's testing center.

**STUDENT CONDUCT:** Appropriate student conduct is expected at all times (see student handbook). Students caught cheating will receive a grade of ZERO for the exam. Repeat cheaters will receive a letter grade of F for the course. Papers may be checked electronically for plagiarism. Plagiarized papers will be awarded a grade of ZERO.

**ADA:** Students who require reasonable accommodations for disabilities must contact the ADA Counseling office at (713) 718-5422 at least two weeks before the first scheduled exam. Faculty are not authorized to make necessary arrangements without prior official recommendations from the ADA office.

**GRADE CALCULATION:**

3 Lecture Exams:	70%
Lab reports:	5%
Home work:	5%
Genetic Disorder Seminar:	20%

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Total:	100%
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**GRADING SCALE:**

A=90% and up
B=80-89%
C=70-79%
D=60-69%
F=59% and below

**IMPORTANT DATES:**

**06/26/2017: LAST DAY FOR ADMINISTRATIVE/STUDENT WITHDRAWAL**

**07/03/2017: GENETIC DISORDER SEMINAR**

**07/05/2017: NON COMPREHENSIVE FINAL (12 Noon sharp)**

**TENTATIVE COURSE SCHEDULE:**

Date	
06/05	Introduction; Chapters 1
06/06	Chapters 2, 3

06/07	Lab: Microscope use and care Chapter 3
06/08	Chapters 4, 5
06/09	Lab Mitosis/Meiosis; Chapter 6
06/12	Lab: Punnett Square, Pedigree Chapters 7
06/13	Chapters 8, 9
06/14	Lab: ABO blood type
06/15	Chapter 10
06/16	<b>TEST 1 Two topics for seminar due</b>
06/19	Lab: Micropipette and Centrifuge
06/20	Chapters 11, 12
06/21	Lab: DNA extraction
06/22	Chapters 13, 14
06/23	Lab: 5A GFP PCR <b>One page summary for presentation due</b>
06/26	Lab: Gel electrophoresis
06/27	Chapters 15, 16
06/28	Chapters 17 Lab: Transformation part 1
06/29	Chapters 18, 19
06/30	<b>TEST 2</b> Chapters 20; Lab: Transformation part 2
07/03	Chapters 21, 22
07/04	<b>Independence Day Holiday</b>
07/05	Chapters 23, 26
07/06	<b>Seminar Presentation</b>
07/07	<b>Final Exam</b>

**THE INSTRUTOR RESERVES THE RIGHT TO CHANGE INFORMATION IN THIS SYLLABUS.**