BSC 304.01E: Genetics – Fall 2022

MWF 11:00 – 11:50 pm; STC 122

Instructor Information:
Dr. Bjorn Schmidt
Office: STC 212
Email: bjorn.schmidt@tamuc.edu
Preferred contact: email
Office hours: MWF 10:00 am – 10:50 am, or by appointment through email

Textbook and materials

Genetics, Analysis & Principles. 2020. 7th edition, Brooker, Robert J.

Need both textbook (lecture course) and online Connect Access (for labs)
These can be purchased separately or as bundle package (may save a little money, depending on vendor)

Bundle Package (looseleaf textbook + Connect)
ISBN: 978-1264079797

Textbook (hardcover) alone
ISBN: 978-1260240856

Access to a computer and d2l (myleo online) is also required some course materials and grade feedback will be uploaded through d2l

Course Description

This course is for biology and pre-professional majors with a good understanding of general biology and general chemistry. The course will provide a rigorous foundation of principles of genetics that act at the molecular, organismal, and population levels, including in humans. Topics will range from Mendelian and non-Mendelian mechanisms of inheritance, the molecular structure of DNA and chromosomes, DNA replication, gene transcription, mRNA translation, mutation and DNA repair, gene regulation, genetics of viruses, genetic technologies, and medical genetics.

Course Requirements

Prerequisites: BSC 1406, BSC 1407, and Chem 1311, with minimum grade of C

Minimal Technical Skills Needed:

- Proficiency in using the D2L Brightspace Learning Management System in myLEO Online
- Proficiency in using and access to Microsoft PowerPoint

Student Learning Outcomes

- Students will understand how genetic information for biological functions is structured and replicated in DNA and chromosomes
- Students will be able to understand patterns and processes of Mendelian and non-Mendelian genetic inheritance
- Students will be able to describe gene transcription and mRNA translation leading to production of proteins influencing biological characteristics and functions
- Students will understand gene regulation and epigenetic effects
- Students will understand genetic components of the viral reproduction cycle
- Students will understand how variability is introduced into the genetic code through DNA mutations, and how DNA repair systems repair damaged DNA
- Students will be able to understand principles of genetic techniques, including PCR, DNA sequencing, and gene editing with CRISPR/Cas9 system
- Students will be able to understand medical applications of genetics

Laboratory

Students are **required** to be enrolled in the BSC 304LW course which will reinforce content covered in the BSC 304. The laboratory component will include virtual modules designed to reinforce chapters covered in the course. The grade for the laboratory component will contribute to about **25%** of your final grade for the course. Students will need to follow all rules and policies of the lab syllabus provided in BSC 304LW.

Instructional Methods

Instruction will consist of in-class lectures and discussions. Students are also expected to do at home readings corresponding to chapter content covered in the class lectures as shown in the course schedule. PowerPoints for lectures will be made available that day through d2l (myLeo Online). Material for homework and tests will primarily come PowerPoint lectures, with learning of this material reinforced by class readings (in other words, content found in the book but not covered in lectures will not be included on tests). Announcements will be presented during class time and will also be announced in d2l system. Gradebooks will be maintained in d2l.

Course Evaluations

Tests: There will be three term exams on specific class days and a comprehensive final exam scheduled during finals week. Material for the final exam will be 33% new material that was covered after exam 3 and 67% earlier material that was covered on exams 1-3.

Homework: There will be 4 homework assignments as specified in the course schedule. Each assignment will be worth 30 points. These assignments are intended to serve as a study guide for the material and to help prepare for exams. Questions will be made available towards the beginning of that section of the course, and students can fill out answers outside of class over several weeks. Homework answers will be reviewed before each test in a study session.

Quizzes: Seven short quizzes will be periodically given in class during the semester as indicated in the schedule. These will be worth 10 points each and are intended to help students prepare for exams.

Grading
A: 89.96-100%
B: 79.96-89.95%
C: 69.96-79.95%
D: 59.96-69.95%
F: <59.96%

Evaluation Points
3 Exams - 300 points (100 points each)
Final Comprehensive Exam - 150 points
4 homework assignments - 120 points (30 points each)
7 quizzes - 70 points (10 points each)
Attendance & participation - 20 points
Laboratory grade - 220 points (25% of total points)

Total points = 880

General Makeup Policy: The student is responsible for requesting a makeup when they are unable to submit the regularly scheduled assessment before the due date and must schedule the makeup by email within **2 days** after the class date. If the assessment is not made-up, the student will receive a zero for that item. Makeup requests based on illness will need documentation of illness. Please do not attend class when sick.

Syllabus Change Policy
The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

Tentative Course Schedule (subject to change)

Week of	Topics (Book Chapters)
8/29	Mon, Wed: Syllabus/Welcome; Introduction to Genetics (Ch. 1) Fri: Basic Mendelian Inheritance (Ch. 2)
9/05	**Mon: *Labor Day holiday – no class*** Wed, Fri: Basic Mendelian Inheritance (Ch. 2) *Fri: -**Quiz 1** (Chs. 1-2)-
9/12	Mon, Wed: Cell Division & Sexual Reproduction (Ch. 3) Mon: **HW 1 questions posted (due 10/02 at 11:59 pm)** Fri: Extensions of Mendelian Inheritance (Ch. 4)
9/19	Mon, Wed: Extensions of Mendelian Inheritance (Ch. 4) *Wed: -**Quiz 2** (Chs. 3-4)- Fri: Non - Mendelian Inheritance (Ch. 5)
9/26	Mon: Fri: Non - Mendelian Inheritance (Ch. 5) Wed, Fri: Gene Linkage & Gene Mapping (Ch. 6) Fri: -**Quiz 3** (Chs. 5-6)-
10/03	Mon: study session; HW 1 review (Chs. 1-6) ***Wed - Exam #1 (covers topics from Chs. 1-6)*** Fri: Molecular structure of DNA/RNA (Ch. 9)
10/10	Mon: Molecular structure of DNA/RNA (Ch. 9) Mon: **HW 2 questions posted (due 10/23 at 11:59 pm)** Wed, Fri: Chromosome Structure (Ch. 10)
10/17	Mon: Chromosome Structure (Ch. 10) Wed, Fri: DNA Replication (Ch. 11) *Fri: -**Quiz 4** Chs. 9-11-

10/24	Mon: study session; HW 2 review (Chs 9-11) ***Wed: Exam #2 (covers topics from Chs. 9-11) *** Fri: Gene Transcription & RNA Modification (Ch. 12)
10/31	Mon: Gene Transcription & RNA Modification (Ch. 12) Mon**: HW 3 questions posted (due 11/17 at 11:59 pm)** Wed, Fri: Translation of mRNA (Ch. 13)
11/07	*Mon: -**Quiz 5** Chs. 12-13- Mon, Wed: Gene Regulation in Eukaryotes I: Transcriptional & Translational Regulation (Ch. 15); miRNA interference (Ch. 17-3) Fri: Gene Regulation in Eukaryotes II: Epigenetics (Ch. 16-1, 16-2)
11/14	Mon, Wed: Genetics of Virus (Ch. 18-1, 18-2); CRISPR/Cas9 system (17-5) *Wed: -**Quiz 6** Chs. 15-18 (only chapter sub-sections above for 16, 17, 18)- Fri: study session; HW 3 review (Chs. 12-13, 15-18, only sections above)
11/21	***Mon: Exam #3 (covers topics from Chs. 12, 13, 15, 17-3, 16-1, 16-2, 18-1, 18-2, 17-5) *** Wed: Gene Mutation, DNA Repair, & Recombination (Ch. 19) **Fri: *Thanksgiving holiday – no class***
11/28	Mon: Gene Mutation, DNA Repair, & Recombination (Ch. 19) Mon: **HW 4 posted (due 12/08 at 11:59 pm)** Wed, Fri: Molecular Technologies (Ch. 20)
12/05	Mon, Wed: Medical Genetics (Ch. 24) *Wed: -**Quiz 7** Chs. 19-20, 24 Fri: study session; HW 4 review (Chs. 19-20, 24)
12/12	**Final Exam – Wed. Dec 14: 10:30am – 12:30am (STC 122)** **67% material covered on Exams 1-3,** **33% material after Exam 3 (Chs. 19, 20, 24)**

Technology Requirements:

LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the *my*LEO Online Learning Management System (LMS). Below are technical requirements:

LMS Requirements:
https://community.brightspace.com/s/article/Brightspace-Platform-Requirements

LMS Browser Support:
https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

Access and Navigation
You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu

Communication and Support
If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of *Brightspace*, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

https://community.brightspace.com/support/s/contactsupport

Interaction with Instructor Statement

Response time to any questions sent by email regarding the course will be answered within 72 hours. However, students are encouraged to interact with the instructor directly during the class time and office hours, if necessary. Exceptions such as widespread internet outage apply.

Counseling Services Statement

The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.tamuc.edu/counsel

Course and University Procedures/Policies:

Course Specific Procedures/Policies:
You are expected to check your TAMUC email and d2l every day to check for any announcements. Additional information about all course assessment components is provided under "Course Evaluations". Please do not attend class if feeling ill, if an illness occurs during a course assessment, please see the "General Makeup Policy" section above for guidance.

University Specific Procedures:

Student Conduct
All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook.
http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: Netiquette
http://www.albion.com/netiquette/corerules.html

TAMUC Attendance
For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01.
http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

Graduate Student Academic Dishonesty 13.99.99.R0.10

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf

Students with Disabilities – ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Gee Library- Room 162
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@tamuc.edu
Website: Office of Student Disability Resources and Services
http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web url:
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.
at 903-886-5868 or 9-1-1.