GENETICS BIOL 2416  
Department of Life Sciences  
SPRING 2019

A. COURSE INFORMATION
   
   Course number/section: BIOL 2416.002  
   Class meeting time: Lecture: MW 3:30-4:45 PM  
   Class location: Lecture: CS 101  
   Course Website: https://bb9.tamucc.edu/ (select BIOL2416)

B. INSTRUCTOR INFORMATION
   
   Professor: Dr. Brandi Kutil  
   Office hours: Mon/Wed 12:15-1:45pm and Tues/Thurs 1-2pm,  
   or email for an appointment at an alternate time.  
   Office location: FC 125  
   Telephone: 361-825-3456  
   e-mail: brandi.kutil@tamucc.edu

   SI Leader: TBA

   TA: TBA

C. COURSE DESCRIPTION
   
   Catalog Course Description  
   Principles of genetic transmissions and molecular basis of heredity and variation. Weekly  
   recitation periods will involve team assignments, problem solving activities, and seminars.

   Extended Course Description  
   Genetic principles provide the context for all the biological and medical sciences, are utilized  
   in courts of law, and help us understand who we are and how we function. Therefore,  
   mastery of the principles learned in this course will benefit all students, either in their  
   professional careers or personal lives.

   This course introduces students to the basic principles of inheritance and expression of  
   genetic information. Current topics in and applications of molecular genetics are briefly  
   covered as well. Emphasis will be placed on critical thinking and problem solving in the  
   context of inheritance and the molecular basis of heredity.

D. PREREQUISITES AND COREQUISITES
   
   Prerequisites  
   Prerequisites (all with a grade of ‘C’ or above): BIOL 1406 - Biology I, BIOL 1407 -  
   Biology II, CHEM 1411 - General Chemistry I and CHEM 1412 - General Chemistry II.
E. **TEXTBOOK(S), READINGS AND SUPPLIES**

**Required Online Textbook Materials**

Top Hat: We will be using the Top Hat (www.tophat.com) classroom response system for in-class exercises. You will be able to submit answers using Apple or Android smartphones and tablets, laptops, or through text message. Top Hat subscriptions can purchased through the Top Hat website or through the bookstore.

**Optional Textbook(s) or Other References**

**Supplies**
Pencil, paper, lecture notes, and a computer or other electronic device for use with Top Hat.

F. **STUDENT LEARNING OUTCOMES AND ASSESSMENT**

Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what students are expected to learn to be successful in the course. The student learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes, students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

Upon the successful completion of this course, students should be able to:

1. Demonstrate an understanding of where and how heritable information is stored
2. Describe the molecular structure and nature of heritable information
3. Demonstrate an understanding of how heritable information is accessed and used to construct and maintain living organisms
4. Demonstrate an understanding of how heritable information is replicated and transferred from one cell or individual to another
5. Explain the connection between genotype and phenotype
6. Understand basic principles of population genetic theory
7. Understand basic principles of evolutionary theory and how genetic processes lead to evolution.
Additionally, students should be able to:

8. Name several famous scientists in the field, and describe their most noteworthy findings

9. Use the scientific method and statistical models to definitively answer questions and rigorously test hypotheses of a genetic nature.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

BIOL 2416 consists of two 75 minute lectures and one 120-minute recitation each week. The recitation period is designed for discussion, idea exchange, and active learning activities to reinforce lecture material.

H. MAJOR COURSE REQUIREMENTS AND GRADING

Student learning outcomes will be assessed using in class exercises, recitation assignments, and exams. Your final grade will be based on the percentage you earn out of the total possible points, extra points may be built into exams or other assignments. It is also possible to lose points by turning in assignments late or failing to attend recitation. Statistical manipulations to adjust grades, if used (at the Instructor’s discretion), will be performed for each exam individually and all recitations in aggregate. A standard grading scale will be used:

\[
\begin{array}{ll}
\text{A} = 90 & - 100 \% \\
\text{B} = 80 & - 89.9 \% \\
\text{C} = 70 & - 79.9 \% \\
\text{D} = 60 & - 69.9 \% \\
\text{F} = 0 & - 59.9 \%
\end{array}
\]

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>15</td>
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<tr>
<td>Exam 2</td>
<td>15</td>
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<tr>
<td>Exam 3</td>
<td>15</td>
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<tr>
<td>Final Exam (comprehensive)</td>
<td>15</td>
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<tr>
<td>Lecture Assignments</td>
<td>15</td>
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<tr>
<td>Recitation Assignments</td>
<td>25</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
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## I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture Topic</th>
<th>Reading</th>
<th>Recitation Topic(s)</th>
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<tbody>
<tr>
<td>1/14</td>
<td>Introduction to Genetics</td>
<td>Ch1</td>
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<tr>
<td>1/16</td>
<td>Mendelian Inheritance</td>
<td>Ch 2</td>
<td>Pedigrees</td>
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<tr>
<td>1/21</td>
<td>MLK Holiday</td>
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<tr>
<td>1/23</td>
<td>Mendelian Inheritance II</td>
<td>Ch 2</td>
<td>Probability and Statistics</td>
</tr>
<tr>
<td>1/28</td>
<td>Chromosomal Organization</td>
<td>Ch 3</td>
<td></td>
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<tr>
<td>01/30</td>
<td>Reproduction and Transmission of Genetic Material</td>
<td>Ch 3</td>
<td>Mitosis, Meiosis and Sex Chromosomes</td>
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<tr>
<td>2/4</td>
<td>Extensions of Mendelian Inheritance</td>
<td>Ch 4</td>
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<tr>
<td>2/6</td>
<td>Non-Mendelian/ Epigenetic Inheritance</td>
<td>Ch 5</td>
<td>Extensions of Mendelian and Non-Mendelian Inheritance</td>
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<tr>
<td>2/11</td>
<td>Quantitative Traits</td>
<td>Ch 28</td>
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<tr>
<td>2/13</td>
<td><strong>Exam 1</strong></td>
<td></td>
<td>Group Exam</td>
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<tr>
<td>2/18</td>
<td>Linkage and Mapping</td>
<td>Ch 6,7</td>
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<tr>
<td>2/20</td>
<td>Chromosome Mapping/Genomic Analysis</td>
<td>Ch 23</td>
<td>Linkage and Genomic Mapping</td>
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<tr>
<td>2/25</td>
<td>Chromosomal Mutations</td>
<td>Ch 8</td>
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<tr>
<td>2/27</td>
<td>DNA, RNA, and Chromosomal Structure and Organization</td>
<td>Ch 9,10</td>
<td>DNA and Chromosomal Structure and Rearrangements</td>
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<tr>
<td>¼</td>
<td>DNA Replication: Prokaryotes</td>
<td>Ch 11</td>
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<tr>
<td>3/6</td>
<td>DNA Replication: Eukaryotes</td>
<td>Ch 11</td>
<td>Replication and DNA Models</td>
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<td><strong>Spring Break, March 11-15</strong></td>
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<tr>
<td>3/18</td>
<td>Transcription and RNA Modification</td>
<td>Ch 12</td>
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<tr>
<td>3/20</td>
<td>Translation of mRNA/Mutations</td>
<td>Ch 13,19</td>
<td>Transcription and Translation</td>
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<tr>
<td>Date</td>
<td>Lecture Topic</td>
<td>Reading</td>
<td>Recitation Topic(s)</td>
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<tr>
<td>3/25</td>
<td>Mutations</td>
<td>Ch 19</td>
<td></td>
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<tr>
<td>3/27</td>
<td>Exam 2</td>
<td></td>
<td>Group Exam</td>
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<tr>
<td>4/1</td>
<td>Regulation of Gene Expression in Prokaryotes</td>
<td>Ch 14</td>
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<tr>
<td>4/3</td>
<td>Regulation of Gene Expression in Eukaryotes</td>
<td>Ch 15,16</td>
<td>Gene Regulation</td>
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<tr>
<td>4/8</td>
<td>Molecular Technologies/ Biotechnology</td>
<td>Ch 21</td>
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<tr>
<td>4/10</td>
<td>Medical and Dev. Genetics</td>
<td>Ch 22, 25,26</td>
<td>Medical/Biotechnology</td>
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<tr>
<td>4/15</td>
<td>Population Genetics</td>
<td>Ch 27</td>
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<tr>
<td>4/17</td>
<td>Pop / Evolutionary Genetics</td>
<td>Ch 27,29</td>
<td>Population Genetics</td>
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<tr>
<td>4/22</td>
<td>Evolutionary Genetics</td>
<td>Ch 29</td>
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<tr>
<td>4/24</td>
<td>EXAM 3</td>
<td></td>
<td>Group Exam/Movie</td>
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<tr>
<td>4/29</td>
<td>Genetic Ethics</td>
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<tr>
<td>5/1</td>
<td>Final Exam Review Session</td>
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<tr>
<td>5/6 or 5/8</td>
<td>FINAL EXAM 1:45-4:15pm (Comprehensive Final)</td>
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Note: Changes in this course schedule may be necessary and will be announced to the class by the Professor. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

J. COURSE POLICIES

Attendance/Tardiness
Attendance is expected in both lecture and recitations. Failure to attend recitation will result in a 50% deduction for that assignment. You are responsible for the material covered in every lecture and recitation, even if it is not in the book, regardless of your attendance. Therefore, both tardiness and lack of attendance are likely to negatively impact grades. Routine events (non-emergency medical visits, parent-teacher conferences, household or auto repairs) should be scheduled to avoid conflicts with class.
Documentation is required for an absence to be excused. For example, if you are too ill to attend a recitation, you must provide a doctor’s excuse on official stationary or a prescription form with applicable dates. Dr. Kutil will make the final determination as to whether an absence is excused or not. This policy also applies to students participating in University-sanctioned activities (such as athletics); however, in such cases, arrangements must be made at least one week ahead of time, and excuses must be documented via a letter or memo on official university letterhead or an email from a university address by the supervising coach or faculty member. If you participate in University Athletics, please inform your coach that a form letter with a list of students on the team or on several teams is NOT acceptable. I need a letter or a list of students in Genetics only.

NOTE: If you are faced with an extensive illness or family emergency that keeps you out of all your classes for more than a day or two, you should contact the Dean of Student Engagement and Success. This office assists students in difficult circumstances. Take advantage of these and other University services as you may need!

Late Work and Make-up Exams
Ten percent is deducted per day (week or weekend days) on late homework assignments. For university-sanctioned events or activities, you may arrange to take a lecture exam at a prior time; notify Dr. Kutil at least one week prior to scheduled exam. For recitations, you may make arrangements in advance to attend another section, if you can do so without missing another class. If you cannot attend another recitation, specifics should be worked out with your TA. For a medical emergency a make-up exam may be granted but it must be scheduled within three days of the students return to campus.

Cell Phone, Tablet, and Laptop Use
Please refrain from using smart phones or laptops in class except for specific class exercises and facilitation of the learning process. Appropriate uses include; taking notes, looking up materials during discussion and looking at relevant papers. Inappropriate uses include; checking email, looking at Snapchat, playing solitaire and shopping. If a student abuses the privilege of using electronic devices in class or distracts others from learning, this privilege will be revoked.

Food in Class
Eating in class is not prohibited unless it proves disruptive.

Participation
Attendance and Participation in both lecture and recitation are expected. 50% will be deducted from a recitation assignment if a recitation was not attended. Missed lecture points cannot be made-up.

Black Board
Students are responsible for visiting the course BlackBoard site regularly. Updates to lecture outlines or study guides and other information, such as required homework assignments, will be available on this site.
If you have never used BlackBoard before, click on “Black Board” under Quick links at the bottom of the university homepage, choose “I am a new user” and follow the instructions. If you have any problems logging into BlackBoard, please call the Online Help Desk at 361-825-2825.

McGraw Hill Connect
Students should have already registered for and begun completing homework assignments on the textbook-associated website, McGraw Hill Connect. In addition to required homework assignments for each week and extra credit LearnSmart assignments for each chapter, it contains answers to ALL textbook chapter problems, outlines, animations, self-quizzes, and extra practice questions. Please link to this website directly from BlackBoard. As you login, you may purchase the online access or a two-week free trial version is available for those who are not yet able to purchase the full version. A loose-leaf text can also be purchased after login with paid online access.

K. COLLEGE AND UNIVERSITY POLICIES

- **Academic Integrity (University)**
  University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a failing grade.

- **Classroom/Professional Behavior**
  Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.

- **Statement of Civility**
  Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.
• **Deadline for Dropping a Course with a Grade of W (University)**
  I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. **Please consult with your academic advisor, the Financial Aid Office, and me, before you decide to drop this course.** Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Please consult the Academic Calendar ([http://www.tamucc.edu/academics/calendar/](http://www.tamucc.edu/academics/calendar/)) for the last day to drop a course.

• **Grade Appeals (College of Science and Engineering)**
  As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at [http://www.tamucc.edu/provost/university_rules/index.html](http://www.tamucc.edu/provost/university_rules/index.html), and the College of Science and Engineering Grade Appeals webpage at [http://sci.tamucc.edu/students/GradeAppeal.html](http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

• **Disability Services**
  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 believe you have a disability requiring an accommodation, please call (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

  If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

  [http://disabilityservices.tamucc.edu/](http://disabilityservices.tamucc.edu/)
• **Statement of Academic Continuity**
  In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

**GENERAL DISCLAIMER**

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.