GENETICS: BIMS 4375  
Department of Life Sciences  
Summer II 2016

A. COURSE INFORMATION
   Course number/section: BIMS 4375
   Class meeting time: Meeting times: M,T,W,R 3:30 pm -5:25pm
   Class location: Lecture: EN 107
   Course Website: bb9.tamucc.edu

B. INSTRUCTOR INFORMATION
   Instructor: Xavier F. Gonzales, PhD, MSPH
   Office location: Engineering 310C
   Office hours: T,W,R: 10:40am-12:00pm & 5:30pm-6pm
   Telephone: 361-825-3824
   e-mail: Xavier.Gonzales@tamucc.edu
   Appointments: email me to set up appointments
   Email Responses: I will typically respond to emails between 11am-12pm M,T,W,R
   Recitation Instructor: TBA

C. COURSE DESCRIPTION
   Catalog Course Description
   Studies of how microorganisms invade the host and produce pathological symptoms
   associated with diseases. Emphasis is on the interaction between various host cells and
   pathogens, especially molecular mechanisms of pathogenesis and host immune responses.
   Prerequisite: BIOL 2421.
   Extended Course Description
   This course will be an introduction to molecular and cellular basis of microbial disease and
   the host response. Students will be given a comprehensive overview of representative model
   microbial systems to illustrate the mechanisms of disease pathogenesis and the influence of
   environment (i.e. host or ambient). Research papers on mechanisms of pathogenesis and host
   immune response will be discussed to provide awareness of scientific approaches used to
   investigate these processes.

D. PREREQUISITES AND COREQUISITES
   Prerequisites
   BIOL 2421

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES
   Required
   MasteringMicrobiology with Pearson eText -- Instant Access -- for Brock Biology of
   Microorganisms, 14th Edition;
Other OPTIONAL References

Required Reading
Much of the lecture will be derived from assigned published manuscripts and the recommended text. Each of the papers that you will need for this class will be available for you to print from Blackboard. Be sure that you print the needed paper(s) and read them prior to the lecture for which it was assigned. Papers will be over recent primary journals. You must bring a copy of these papers to class. Quizzes/Homework/Assignments will be derived from these papers and the lecture material. MasteringMicrobiology etext will help you in understanding the concepts that will be highlighted.

Supplies
- On-line textbook, paper, and pencil (scantrons when indicated)

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.

By the end of this course, students should be able to:
1. Utilize specialized language relevant to pathogenic microbiology
2. Compare and contrast different microbial diseases, based on specific pathogenic properties utilized by microorganisms
3. Identify the roles of ecology and evolution in the spread of infectious diseases
4. Identify the roles that the host plays within an infectious disease. (i.e. innate and acquired immunity)
5. Describe microbial strategies to evade the immune response
6. Describe strategies microorganisms use to attach, invade and multiply in a host.
7. Understand the toxins and enzymes produced which contribute to pathogenesis
8. Critically analyze current literature relating to pathogenic microbiology.
9. Evaluate case studies describing specific host-pathogen interactions.
10. Critically evaluate current strategies in impeding microbial pathogenesis
G. INSTRUCTIONAL METHODS AND ACTIVITIES

Learner-Centered Teaching: Collaborative work, control of content selection, personal reflection, learning skill demonstration

H. MAJOR COURSE REQUIREMENTS AND GRADING

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
</tr>
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<tbody>
<tr>
<td>Exams</td>
<td>40</td>
</tr>
<tr>
<td>Quizzes</td>
<td>10</td>
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<tr>
<td>Journal Discussion</td>
<td>10</td>
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<tr>
<td>Pathogenic Microbe Project</td>
<td>30</td>
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</tbody>
</table>

Grading scale: A>90%  B=80-89.9%  C=70-79.9%  D=60-69%  F<60%

Lecture/Recitation
Exams @ 100 pts. Each = 200 pts
Cumulative final exam = 200 pts
Journal Discussion = 100 pts
Quizzes = 100 pts
Pathogenic Microbe Project = 300 pts
Total = 1000 pts

Nature of Assignments:

Team Learning: We will use a team learning approach in this class. Permanent groups will be established at the start of the course. Research examining team learning assignments show that the group score is HIGHER than individual scores and that students understand concepts much better as a result of discussing questions in groups. Sometimes each group member will submit answers individually and sometimes groups will submit group consensus answers to questions. We will use the team learning approach on in-class assignments.

Exams will be comprised mainly of multiple choice questions. Some may be setup as matching or fill-in the blank. Problems and/or essay questions may appear on the exams. Most questions, including multiple choice questions typically require analysis and interpretation of data or experimental design to assess critical thinking skills. The Final Exam: Friday, August 5. Cell phones must be turned off and put away during exams.

I may allow students to use one sheet of handwritten notes on the cumulative final exam. This is not a right, but a privilege which must be earned and may be taken away by the instructor at any time. Only the front and back of a single 8.5” x 11” page with no typing, photocopying or
computer generated information of any kind will be allowed. If at any time during the semester you engage in academic dishonesty on any assignment, you will forfeit this privilege for the rest of the term. This includes cheating, helping others to cheat, and even failure to report the dishonest actions of others.

PATHOGENIC MICROBE PROJECT
(Work will be graded by your group partners, your class peers, and by me)

1. Each of you will be assigned to a group of three or four. This group will be assigned a pathogen listed in the syllabus schedule below. As a group you are responsible for identifying a recent (last 4 years) review on the pathogenesis of the assigned microorganism. This should be emailed to me before class by July 11th.

2. Each student in the group should provide a complete (1 page) description of their assigned organism. This should include identifying characteristics, such as gram reaction, specific nutritional requirements, shape, etc., as well as a picture of the organism. I strongly suggest you utilize Bergey’s Manual (There is a copy in the library). This should be emailed to me before class by July 19th.

3. The group must then find a recent (2 years) primary research article on this particular organism and submit the abstract to me for verification. Once you have the okay, complete a reading report on a recent primary journal that will be used as one of your references.

4. Finally, each group will develop a PowerPoint presentation in IMRaD format. The presentation should include background information collected in step 2 and the information gathered for step 3.

READING REPORTS

Part 1

1. Provide the title, author(s), date and source of each reading.
2. Indicate the senior author's affiliation (e.g. Department of Microbiology and Molecular Genetics, Michigan State University).
3. Observation that led to research (look in abstract and introduction)
   a. Describe 2–3 observations.
4. Question (try rewording the title)
   a. Identify the model organism/system.
   b. State why the model is an appropriate choice.
   c. State why the question is important (what did the authors hope to learn about the field?).
5. Hypotheses (usually not stated but implied in abstract or introduction; look for phrases like “this research shows…”)
   a. Explain why these hypotheses make sense based on current knowledge (introduction).
6. Experiment (look at the figures to determine what they did)
   a. Choose 2–3 key figures that directly address the hypotheses.
   b. Restate the model organism/system (figure legend).
   c. Describe general experimental design; what was measured/compared and how?
d. Describe the methods and controls (draw a flow diagram on the board when presenting).
e. Explain why the choice of controls was appropriate.

Part 2.
7. Results (look at the figures first)
   a. Explain figures clearly; restate what is being compared to what for each one.
   b. Look for trends; e.g., What is increased over what?
   c. Identify the controls and how they validate the trends.
   d. Look for statistical analyses (figure legend or results) that validate the data.

8. Conclusion (based on the data, not on the discussion)
   a. Does the data support the hypotheses?
   b. Are there other possible explanations for the data?
   c. Is the data convincing (stats)?
   d. How could the experiment be improved?
   e. Why is the data interesting; how does it contribute to our understanding of the field?

## I. COURSE CONTENT/SCHEDULE

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture Topic</th>
<th>HW Due</th>
<th>Quiz</th>
<th>Journal</th>
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</thead>
<tbody>
<tr>
<td>07/05</td>
<td>Pathogenesis Introduction</td>
<td></td>
<td></td>
<td>How to Read a Journal</td>
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<tr>
<td>07/06</td>
<td>Innate Immunity</td>
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<td>Nature Immunology 17, 356–363 (2016)</td>
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<td>Adaptive Immunity</td>
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<td>Clinical &amp; Translational Immunology (2016) 5, e85; doi:10.1038/cti.2016.22</td>
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<td>Clinical &amp; Translational Immunology (2016) 5, e85; doi:10.1038/cti.2016.22</td>
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<td>07/18</td>
<td><strong>Exam I</strong></td>
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<tr>
<td>07/19</td>
<td><em>Pseudomonas aeruginosa</em></td>
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<td>TBD</td>
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<td>07/20</td>
<td><em>Pseudomonas aeruginosa</em></td>
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<td>07/28</td>
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<td><strong>Exam II</strong></td>
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<tr>
<td>08/02</td>
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<td>Project (3)</td>
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<td>08/03</td>
<td>Pathogenic Microbe Project Presentation</td>
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J. COURSE POLICIES

Emails
I am happy to communicate with you through emails but I do expect you to do so in a professional manner. Emails are not text messages, therefore, do not right them in that style. I expect an appropriate salutation followed by a brief explanation of the purpose of your email. I would prefer that you ask everything at once and it would be best to put all your questions in bullets to allow me to answer behind the question. Further, I do not answer emails on the weekend. If you sent your email during professional working hours (M-F: 9am-5pm) and it did not get answered after 24hrs it was more than likely lost in all my emails. Please resend the email.

Attendance/Tardiness
Attendance: Students are expected to attend every scheduled class. It is the responsibility of the student to obtain any material missed during an absence from his/her classmates. Tardiness: Students may enter when late but be respectful of your peers and do not disrupt the class as you enter.

Late Work and Make-up Exams
No late work will be accepted. It is your responsibility to review the syllabus for when items are due. It is also your responsibility to get it turned in through the appropriate outlet on the designated day.

No make-up exams will be given; one exam can be dropped and replaced by the grade from the Final Exam.

Extra Credit
Missed extra credit opportunities—Instructor is not obligated to give make-up assignments for extra credit opportunities, whether excused or unexcused.

Cell Phone Use
Lecture: Students are not allowed to use cell phones in class. Students will be asked to leave the room if found using cell phones in class. If it is urgent for you to use your phone feel free to exit the room to utilize your phone.

Laptop Use
Lecture: Students may utilize their laptops as long as it does not disrupt others in class.
Food in Class
Lecture: Students may eat food as long as it does not disrupt others in class. It is the student’s responsibility to clean up after themselves. If you fail to do so, you will no longer be allowed to have food in class.

Missed Exam
No make-up exams will be given; one exam can be dropped and replaced by the grade from the Final Exam.

Participation
Lecture: Students are required to participate in all group activities. Peer evaluations will be given with each activity to determine your final assessment.

BlackBoard and Other Electronic Resources:
Students are responsible for visiting the course BlackBoard site regularly. Updates to lecture outlines or study guides and other information, such as homework assignments, will be available on this site.
If you have never used BlackBoard before, click on Island Online on the homepage, choose BlackBoard under “Island Online Login” and then on “I am a new user” and follow the instructions. If you have any problems logging into BlackBoard, please call the Online Help Desk at x2825 (or 825-2825 from off-campus or 1-866-353-2491 for long distance).

K. COLLEGE AND UNIVERSITY POLICIES

**Academic Integrity (University)**
It is expected that university students will demonstrate a high level of maturity, self-direction, and ability to manage their own affairs. Students are viewed as individuals who possess the qualities of worth, dignity, and the capacity for self-direction in personal behavior.
See Full University Policy at [http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity](http://catalog.tamucc.edu/content.php?catoid=10&navoid=313#Academic_Integrity)

**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.

**Deadline for Dropping a Course with a Grade of W (University)**
The grade of W will be assigned to any student officially dropping a course by July
22, 2016. No student is eligible to receive a W without completing the official drop process by this deadline. Visit the Office of the University Registrar for the Course Drop Form that must submitted. After July 22, 2016 a student will not be allowed 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.
L. OTHER INFORMATION

Have a great semester and enjoy your journey to discover new knowledge

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 and within Blackboard.