Microbial Pathogenesis: BIMS 5375.001
Department of Life Sciences
Fall 2019

Course number/section: BIMS 5375.001
Instructional method: 25-49% online
Class meeting time: MW 2:00 pm -3:15pm
Class location: Lecture: IH 156
Course Website: bb9.tamucc.edu

A. INSTRUCTOR INFORMATION
Instructor: Xavier F. Gonzales, PhD, MSPH
Office location: Tidal Hall 235
Office hours: T: 10:00 am-12:30pm & R: 3:30pm-6:00pm
Telephone: 361-825-3824
e-mail: Xavier.Gonzales@tamucc.edu
Appointments: email me to set up appointments
Email Responses: Only expect responses M-F from 10am-4pm.

B. COURSE DESCRIPTION
Catalog Course Description
Study of the mechanisms by which microorganisms invade a host and produce pathological symptoms associated with disease. Emphasis is on the chemical and molecular interaction between various pathogens and host cells, especially immune responses. Involves discussion of research papers on these topics. Limited to individuals who have not taken BIMS 4375 (Mechanisms of Microbial Pathogenesis) for undergraduate credit. Prerequisite: BIOL 2421 (Microbiology) or equivalent.
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.

C. PREREQUISITES AND COREQUISITES
Prerequisites

D. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES
Required Reading:
Primary literature provided by the professor. Much of the discussion 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. Mastering Microbiology e-text will help you in understanding the concepts that will be highlighted.

**Recommended Reading:**
Mastering Microbiology with Pearson e-Text -- Instant Access -- for Brock Biology of Microorganisms, 14th Edition;

**Other OPTIONAL References:**

**Supplies**
Note taking material and discussion material

**E. STUDENT LEARNING OUTCOMES AND ASSESSMENT**
By the end of this course, students should be able to:
1. Utilize specialized language relevant to pathogenic microbiology
2. Demonstrate a familiarity with various mechanisms of microbial pathogenesis
3. Demonstrate an understanding between immune response and microbial pathogenesis
4. Demonstrate an ability to lead and participate in discussions of science
5. Demonstrate an ability to think critically about the scientific literature on the selected topics
6. Engagement of undergraduate students in discussions of journals
7. Write a credible project summary styled in NIH or NSF formats

**F. INSTRUCTIONAL METHODS AND ACTIVITIES**
This course will be a combination of traditional lecture, discussion, paper reading and in class presentations. This is a group learning style of course. Attendance and participation in class discussions are essential for this type of class to work, the importance of attendance and participation are reflected in the grading scheme.
G. MAJOR COURSE REQUIREMENTS AND GRADING

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<tr>
<th>ACTIVITY</th>
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<tr>
<td>Participation</td>
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<td>Discussion Leader</td>
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<td>Council Microbe Projects</td>
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<td>Eukaryotic Pathogen Presentation</td>
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<tr>
<td>Grant Microbe Project</td>
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**Nature of Assignments:**

**Team Learning:** We will use a team learning approach in this class. **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.

**Attendance:** Attendance in this class is mandatory. There are no formal lectures, and no notes/powerpoint slides to be posted online, so attendance to the class is integral, furthermore, participation in class discussions will make up a large portion of your grade.

**Participation:** This is a discussion based course. Students will receive 15% of their grade from participation and sharing of ideas every week in lecture. Vigorous discussion and debate is welcome, but respect for your colleagues is expected always. Discussions will be moderated by the professor.

**Discussion Lead:** All students are expected to lead the discussion of the presented lecture material and the focal paper. The discussion leader(s) is expected to give a summary of the topic of the day, highlighting or defining important concepts related to the topic, with emphasis on the presented lecture and the focal paper. The use of brief powerpoint slide shows is encouraged for the summary portion. The discussion leader(s) is(are) expected to also lead the discussion of this topic by coming prepared with questions to pose to the group that will be answered by anyone in the class and to keep the flow of the conversation moving. All students are expected to come prepared to lecture each day by reading the focal assigned paper as well as finding their own paper to add to the discussion of the specific topic.

**Council Undergraduates on PATHOGENIC MICROBE PROJECT**

These are the expectations for the undergraduates.

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

1. Each of you will be assigned a partner. 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.
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).

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?


Eukaryotic Pathogen:

Students will be responsible for developing the topic and leading the discussion for eukaryotic pathogens.

Grant Development:

Students will be assigned a microbial pathogen and prepare a Project Summary addressing a mechanism of pathogenesis. The Project Summary (1.5 page maximum) describing the project in the language of the discipline. Include a statement of the research objective(s) and/or hypotheses and discuss the significance of the project to the advancement of knowledge in the field of microbial pathogenesis. Project Summary should be derived from published journals only.

Council Undergraduate Microbe Project:

Student will be expected to aid undergraduate students in understanding the development reading reports and oral presentation for pathogenic microbe project. Student will be expected to meet with instructor outside of class twice each week.
H. COURSE CONTENT/SCHEDULE

Note: Changes in this course schedule may be necessary and will be announced to the class by the Instructor in Blackboard announcements. The assignments and exams shown are directly related to the Student Learning Outcomes described in Section F.

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Items Due</th>
<th>Presenter(s)</th>
<th>Journal Reading</th>
<th>Quiz</th>
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<td>08/26</td>
<td>Course Introduction &amp; Expectations</td>
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<td>Budden et al.</td>
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<td>08/28</td>
<td>Review Journal Training (1: face)</td>
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<td>XFG</td>
<td>Budden et al.</td>
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<td>09/04</td>
<td>Review Journal Training (2: face)</td>
<td>Goals Update: Ex: Read Rao Journal, familiarize syllabus, meet w/group to discuss paper, etc.</td>
<td>XFG</td>
<td>Rao et al.</td>
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<td>Primary Journal Training (1: online)</td>
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<td>XFG</td>
<td>Rao et al.</td>
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<td>09/11</td>
<td>Primary Journal Training (2: face)</td>
<td>Goals Update: Ex: Read Okino Journal; Prepare Immune Mechanisms presentation</td>
<td>XFG</td>
<td>Okino et al.</td>
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<td>09/16</td>
<td>Immune Mechanisms (1: online)</td>
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<td>Toll Like Receptors</td>
<td>Okino et al.</td>
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<td>09/18</td>
<td>Immune Mechanisms (2: face)</td>
<td>Reflections; Goals Update Ex: Read Pipkins Journal, Prepare Airborne Bacteria Presentation</td>
<td>Toll Like Receptors</td>
<td>Pipkins et al.</td>
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<td>09/20 Fri.</td>
<td>Pathogenic Microbe Project</td>
<td>Part 1: Load to Blackboard</td>
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<td>Griffith’s Gram Positives</td>
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<td>09/23</td>
<td>Airborne Bacterial Diseases (1: online)</td>
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<td>Airborne Viral Diseases (1: online)</td>
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<td>Orthomyxoviridaes</td>
<td>Chai et al.</td>
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<td>Airborne Viral Diseases (2: face)</td>
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<td>Yan et al.</td>
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<td>10/14</td>
<td>Direct Contact Diseases (1: online)</td>
<td>Goals Update</td>
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<td>Trombley et al.</td>
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<td>10/21</td>
<td>Sexually Transmitted Diseases (1: online)</td>
<td>Goals Update</td>
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<td>Deadliest Catch</td>
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<td>Discussion on Project Review Papers</td>
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<td>10/30</td>
<td>Pathogenic Microbe Project Rev Papers (1: online)</td>
<td>Reflections; Goals Update; Read Project Rev Papers</td>
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<td>11/04</td>
<td>Pathogenic Microbe Project Rev Papers (2:face)</td>
<td>Two Presentations</td>
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<td>11/06</td>
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<td>11/25</td>
<td>Pathogenic Microbe Project Presentation</td>
<td>Grad Presentations</td>
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I. 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 write 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-R: 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 Quizzes
No late work will be accepted. One quiz can be dropped. 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.

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 Quizzes
No make-up quizzes will be given; one quiz can be dropped.

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).

J. 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/) 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, and the College of Science and Engineering Grade Appeals webpage at 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/

- **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.

K. **OTHER INFORMATION**

- **Academic Advising**
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

**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.