MOLECULAR MEDICAL MICROBIOLOGY BIMS 5374
Department of Life Sciences
Fall 2016 v1

A. COURSE INFORMATION

Course number/section: BIMS 5374.001
Class meeting time: MW 7:00-8:15 pm
Class location: Center for the Sciences (CS) 115
Course Website: http://bb9.tamucc.edu

B. INSTRUCTOR INFORMATION

Instructor: Gregory W. Buck, Ph.D., Associate Professor
Office location: Center for the Sciences (CS) 251
Office hours: MW 10:00-11:15; TR 1:00-2:15
Telephone: (361) 825-3717
e-mail: Gregory.Buck@tamucc.edu
Appointments: Preferred method is by e-mail

C. COURSE DESCRIPTION

Catalog Course Description
Study of common pathogenic microorganisms in eukaryotic animals. Includes bacterial, viral, parasitic and fungal infections, with emphasis on epidemiology, immunity, pathogenesis and treatment. Stress placed on case studies and didactic lectures, with presentations of updates on molecular basis of diseases based on current literature. Limited to individuals who have not taken BIMS 4374 (Medical Microbiology) for undergraduate credit.

Extended Course Description
The course entails a survey of selected major pathogenic bacteria, viruses, fungi, and parasites causing disease in humans, using an organ system approach. The course only highlights major mechanisms of HOW bacteria cause disease (pathogenesis), but specifically delves into WHY specific traits encoded by bacterial genes (virulence factors) may result in disease states, what effects these diseases have on individuals (in short, human microbial ecology), and the basis for therapeutic intervention (antimicrobial treatments). Some effect on groups and populations (public health microbiology) will be discussed. Students are not expected to learn or understand the details of basic science involved in either pathogenesis or virulence of etiologic agents. The course is offered to give graduate students a detailed and exhaustive survey of microorganisms that are of health significance to humans, and to describe the molecular basis for the factors that result in disease. Also, the course also gives graduate students the opportunity to read primary journal articles that focus on current research of these organisms, and to develop the ability to teach current information to undergraduate students.
D. PREREQUISITES AND COREQUISITES

Prerequisites
BIOL 2421, or any general sophomore or junior introductory course in microbiology (Texas Common Course no. BIOL 2421 or its equivalent) using one of the following texts: Alcamo, Baumann, Lin, Harley and Prescott, Nester et al., Madigan et al., Slonczewski and Foster, or Neidhardt et al. Persons having taken a mixed majors microbiology class (BIOL 2420 or equivalent) using the texts of Batzing, Talaro and Talaro, or Totora et al. will need to supplement their knowledge base.

Corequisites
None; BIOL/BIMS 4406 Immunology is highly suggested.

E. REQUIRED TEXTBOOK(S), READINGS AND SUPPLIES

Required Textbook(s)


Optional Textbook(s) or Other References

**Supplies**

Required textbook. Students may need to download and print journal articles at own cost.

**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.

Students will be able to perform these objectives at a level of $\geq 80\%$:

1. **Categorize** the pathology of infectious diseases caused by bacteria and viruses, and by certain selected fungi and parasites;
2. **Sort** infectious diseases to organ systems in both invertebrate and vertebrate organisms;
3. **Formulate** treatment plans of infectious agents using current pharmacological interventions;
4. **Compare and contrast** the epidemiology and immune responses to the pathogens;
5. **Revise** the information given on the Internet pertaining to current diseases, organisms, and treatments, based on current literature reviews;
6. **Investigate** an unknown etiologic agent within a case study for differential diagnoses and most probable pharmacologic treatment.
7. **Analyze and plan** a topic of current interest not covered in class using original primary articles, and **design** a lecture for undergraduates, including Power Point slides and test questions.
8. **Critique** original primary literature involving bacterial pathogenesis.

**G. INSTRUCTIONAL METHODS AND ACTIVITIES**

**Exams**--Four exams at 100 pts each, including a comprehensive final; these exams will consist of short answer, essay, multiple choice, case studies, matching and descriptive T/F questions.

**Case Histories**--You will have four of these exercises, which will be done outside of class as a group unless otherwise noted. These studies may be taken from texts, or written by me. The goal is not to focus on the medical treatment given, but on demonstrating a logical, coherent, rational thought process in elucidating a correct answer. **I reserve the right to give graduate students a different, more**
challenging case than those given to undergraduates.

Power Point presentation--Students will research a current topic related to some micro-organism causing microbial disease or describe its virulence factors, and using a minimum of at least three primary journal articles and one review, present a 20 min Power Point lecture on the topic. The microorganism cannot be one that the instructor has discussed in lecture! They will also design at least four (4) multiple choice questions and one short answer question for possible use on a test. The basis for evaluation will be a rubric with 50% of the grade determined by the instructor, and 50% determined by the undergraduate and other graduate students. The rubric (see next page) will allow grading of the presentation based on format, scientific content, and oral presentation. The instructor will grade the proposed exam questions.

Extra Credit assignments may be given at prerogative of instructor, who is NOT obligated to give make-up extra credit opportunities. These opportunities include quizzes on antibiotics, additional case studies, Internet assignments, or journal articles to read/summarize.

N.B: Instructors reserve the right to assign talks by visiting seminar speakers as an extra case history not included in the four (4), or as a make-up. Instructor may also give information on selected microorganisms not covered in lecture as handouts ("The Weekly Microbe"), Web-based assignments, case histories, journal articles, or MMWR synopses. These organisms can be included on examinations. Students will be responsible for all material (textbook, guest lectures, web sites, case studies, and handouts) covered in the lecture.

H. MAJOR COURSE REQUIREMENTS AND GRADING

Introduction--Please note that Instructor may modify assignments, number of assignments and point values depending on number of students in class. Also note that “any mid-term grades posted on S.A.I.L. and Blackboard are not official University grades, not a guarantee of final grades and are never updated; once they are posted they cannot be changed even if your grade in the class does change.”

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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<tbody>
<tr>
<td>Exams (Including comprehensive final)</td>
<td>67</td>
</tr>
<tr>
<td>Homework (Case Studies)</td>
<td>17</td>
</tr>
<tr>
<td>Power Point Lecture to Undergrads</td>
<td>16</td>
</tr>
</tbody>
</table>
I. **COURSE CONTENT/SCHEDULE**  Chapters are from Murray et al (M) or from Gallagher and MacDougal (G)

<table>
<thead>
<tr>
<th>DATE (BY DAY OR WEEK)</th>
<th>TOPIC</th>
<th>CHAPTER(S)</th>
<th>ASSIGNMENTS</th>
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</thead>
<tbody>
<tr>
<td>#1 - W Aug 24</td>
<td>Review of Bacteria Structure</td>
<td>M-1, 12, 13</td>
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<tr>
<td>#2 - M Aug 29</td>
<td>Normal flora, Pathogenesis</td>
<td>M-2, 14, 15</td>
<td>WM 1-Norm Flora</td>
</tr>
<tr>
<td>#3 - W Aug 31</td>
<td>Infection and Immunity 1</td>
<td>M-7-10</td>
<td>WM2-Immunology</td>
</tr>
<tr>
<td>#4 - M Sep 5</td>
<td>Labor Day Holiday—no class</td>
<td></td>
<td></td>
</tr>
<tr>
<td>#5 - W Sep 7</td>
<td>Infection and Immunity 2</td>
<td>M-7-10</td>
<td>WM2-Immunology</td>
</tr>
<tr>
<td>#6 - M Sep 12</td>
<td>Vaccines</td>
<td>M-11</td>
<td>Case Study 1 given</td>
</tr>
<tr>
<td>#7 - W Sep 14</td>
<td>Antimicrobials 1</td>
<td>M-17; G-5, 7-13</td>
<td>HO 2AB Antibiotics</td>
</tr>
<tr>
<td>#8 - M Sep 19</td>
<td>Antimicrobials 2</td>
<td>G-14-25</td>
<td>HO 2AB Antibiotics</td>
</tr>
<tr>
<td>#9 - W Sep 21</td>
<td>Viral Resp Infections</td>
<td>M-37-38, 42, 46, 47,48, 49, 53</td>
<td>HO 3 Pneumonia</td>
</tr>
<tr>
<td>M Sep 26</td>
<td>Exam 1</td>
<td>Lect. 1-9</td>
<td></td>
</tr>
<tr>
<td>#10 - W Sep 28</td>
<td>Bacterial Resp. Infections 1</td>
<td>M-18, 19, 22, 24</td>
<td>WM3- Staph; WM8-Pseudomonas</td>
</tr>
<tr>
<td>#11 - M Oct 3</td>
<td>Bacterial Resp. Infections 2</td>
<td>M-18, 19, 27, 29</td>
<td>WM3- Staph; WM8-Pseudomonas</td>
</tr>
<tr>
<td>#12 - W Oct 5</td>
<td>Intravascular Infections &amp; Sepsis</td>
<td>M-18, 19, 20, 35</td>
<td>WM3-Staph; Case Study 2 given</td>
</tr>
<tr>
<td>#13 - M Oct 10</td>
<td>Anaerobes; CNS Infections 1</td>
<td>M-21, 23, 24, 56</td>
<td>WM5-Naegleria; WM6-Anaerobes</td>
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<tr>
<td>#14 - W Oct 12</td>
<td>CNS Infections 2</td>
<td>M-29, 31, 43, 50</td>
<td></td>
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<tr>
<td>#15 - M Oct 17</td>
<td>CNS Infections 3</td>
<td>M-52, 54, 58, 60, 64, 65</td>
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<tr>
<td>#16 - W Oct 19</td>
<td>GI Infections 1</td>
<td>M-21, 27, 30, 34, 55</td>
<td>WM 7-Hepatitis</td>
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<tr>
<td>#17 - M Oct 24</td>
<td>GI Infections 2</td>
<td>M-28, 31, 32, 42, 47, 51, 65, 68</td>
<td>WM4-Enterobacteriaceae WM 4C-Vibrios</td>
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<tr>
<td>W Oct 26</td>
<td>Exam 2</td>
<td>Lect. 10-17</td>
<td></td>
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<tr>
<td>#18 - M Oct 31</td>
<td>GU-STD 1</td>
<td>M-23, 32, 33</td>
<td></td>
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<tr>
<td>#19 - W Nov 2</td>
<td>GU-STD 2</td>
<td>M-35, 41, 55</td>
<td>Case study 3 given</td>
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<tr>
<td>#20 - M Nov 7</td>
<td>Obligate Intracellular Bacteria</td>
<td>M-34-35</td>
<td>WM 9 Obl Intracel. Bact.</td>
</tr>
<tr>
<td>#21 - W Nov 9</td>
<td>Skin &amp; Soft Tissue 1</td>
<td>M-18, 19, 25, 27, 30, 32</td>
<td>WM3- Staph; WM8-Pseudomonas;</td>
</tr>
<tr>
<td>#22 - M Nov 14</td>
<td>Skin &amp; Soft Tissue 2; Viral Exanthems</td>
<td>M-41, 42, 44</td>
<td>WM10-Skin Lesions</td>
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<tr>
<td>W Nov 16</td>
<td>Exam 3</td>
<td>Lect.18-22</td>
<td></td>
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<tr>
<td>#23 - M Nov 21</td>
<td>Graduate Student Presentation</td>
<td>TBA</td>
<td>Case Study 4 given</td>
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<tr>
<td>DATE (BY DAY OR WEEK)</td>
<td>TOPIC</td>
<td>CHAPTER(S)</td>
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<tr>
<td>#24-W Nov 23</td>
<td>No Class-Happy Thanksgiving</td>
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<tr>
<td>#26-W Nov 30</td>
<td>Bioterrorism &amp; Emerging Infections</td>
<td>TBA</td>
<td>WM 14-bioterrorism</td>
</tr>
<tr>
<td>#28—Dec 5</td>
<td>Review</td>
<td></td>
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<tr>
<td>M Dec 7</td>
<td>Final Exam and optional Case Study 5</td>
<td>Comprehensive</td>
<td>7:15-9:45 pm Note different time</td>
</tr>
</tbody>
</table>

Handouts (subject to change):
- Weekly Microbe (WM) 1—Normal Flora v8 2014
- WM2-Immunology v3 2015
- WM3-Staph_Strep_Enterococcus v9 2015
- WM4-Enterobacteriaceae v7 2013
- WM4C-Non-cholera Vibrios v7 2016
- WM5-Naegleria v6 2015
- WM6-Anaerobes v8 2013
- WM7-Hepatitis viruses v10 2016
- WM8-Pseudomonas v9 2015
- WM9-Obligate Intracellular Bacteria v9 2013
- WM10-Skin Lesions v9 2015
- Handout 2AB Antibiotics v23 2015
- Handout 3 Pneumonia v5 2016
- WM13-HIV/AIDS v5 2011
- WM14-Bioterrorismv102016

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

J. COURSE POLICIES

Attendance/Tardiness
Students are expected to attend every scheduled class meeting and to be on-time. It is the responsibility of the student to obtain any material missed during an absence from his/her classmates. Power Points are not placed in the library and placement on Blackboard will be limited.

Late Work and Make-up Exams
Students will be given a Late Assignment Penalty for tardy work: 10% assignment grade deduction per class day late. However, after the 3rd day, late assignments will not be accepted. In-class late assignments are defined by being turned in after 7:05 pm. Please
note that class assignments may be sent to me by e-mail or slid under my office door; tardiness is determined by the time noted on the instructor’s Inbox, but allowances can be made for server problems. Files contaminated by viruses, spyware, and worms will not be accepted. DO NOT ASK THE CUSTODIANS to let you into my office to place an assignment on my desk.

**Extra Credit**

Some extra credit is assured as pre- and post-test assessments. No make-ups are given for pre- and post-tests. Other extra credit assignments may be given at instructor’s prerogative. Instructor is **not obligated** to give make-up assignments for extra credit opportunities, whether excused or unexcused. The ONLY possible exception is for students with a university-approved scheduled absence. The make-up (if given) may not be the exact same assignment given to the class.

**Cell Phone Use**

DO NOT USE CAMERA PHONES IN LECTURE. DO NOT SEND TEXT MESSAGES DURING CLASS. Please turn off all cell phones, beepers, Bluetooth devices, Black Berrys, etc., before entering the classroom, or at least place them on silent mode. **I would prefer that earpieces not be worn in lecture.** DO NOT TAKE PHOTOS of Power Point slides or videos with your cell phone camera unless otherwise instructed. Recording of lectures with recorders can only be done with permission of instructor—please see me privately.

**Laptop Use**

I have no problems with any student using a laptop in class, as long as they are not looking at pornography, anime, videos, etc.

**Food in Class**

I prefer that you not eat or drink in class, but I will not throw you out or ask you to leave.

**Missed Exams**

Students have two choices for making up exams due to excused absences. They can do an all-essay make-up exam, or doubling the grade on the final exam. There is no make-up for missed quizzes, or for missed exams due to unexcused absences. Missed extra credit opportunities may or may not be given make-up assignments, depending upon the nature of the assignment. Please note that instructor determines what is not excused. I define excused absences as emergency visits to the ER or physician or dentist; job, graduate and professional school interviews; death of close family members (siblings, in-laws, parents, aunts or uncles, step-parents, grandparents or great-grandparents, first cousins), or University-approved absences as described in the Catalogue and Student Handbook.

**Participation**

I expect that **all members** in the class will participate in the questioning, discussions, and interactions within the lecture. Formal assessment of class participation is not done
as part of grade, but I do informally monitor it, and I will note it if you ask me for a letter of recommendation.

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)**
  The grade of W will be assigned to any student officially dropping a course. Please consult with the instructor before you decide to drop to be sure it is the best thing to do. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. Should dropping the course be the best course of action, visit the Office of the University Registrar for the Course Drop Form that must submitted. No student is eligible to receive a W without completing the official drop process by this deadline. 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 (ADA of 1990, including the ADA Amendments from 2008 (PL 110-325), 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.

  • This act also includes **returning veterans** who may be experiencing cognitive and/or physical access issues in the classroom or on campus. 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.

  • 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.

L. OTHER INFORMATION

- Academic Advising
  - The College of Science and Engineering requires that graduate students meet with their Graduate Advisory Committee (GAC) Chair as soon as possible to formulate a committee and a degree plan, which must be signed by the student, the Chair, and the GAC members. The College's Academic Advising Center is located in CI-350, and can be reached at (361) 825-3928.

- Hints on doing well in course
  First, read the syllabus. Second, re-read the syllabus. Third, read the syllabus again.

Next, read the assigned text chapters. The text is designed for medical student use, so chapters are relatively short and contain plenty of tables, charts and graphs. You need to re and re-read the text in conjunction with the notes taken from class Power Points, the Weekly Microbes and other handouts. This course aims for higher-level critical thinking, not just memorize the textbook and regurgitate facts. If you just memorize, you will obtain a C. If you integrate material and think of how organisms correlate to body systems and to diseases, you will retain information longer and it will make more sense. Please read the frontispiece of the Medical Micro text for an example of how to approach studying for this course. This message came from a current medical student and alumnus:

I had to stop and take a moment to think about Med Micro and be grateful about the way you taught the course. Although it has almost been [three] years, I am grateful that I took your course back then. I may not remember everything, but I know that I am not having as hard of a time as some of my peers ...

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.