**BIO580 MEDICAL MICROBIOLOGY**

**Syllabus Fall 2014**

**A. General information**

Infection is a conflict between a host and a microorganism with two possible outcomes, resistance or disease, dependent on interactions between the infectious agent and the host’s immune response. Medical microbiology, therefore, is a discipline that includes the study of the microorganisms, the host immune system, and interactions between the two. Although bacteria and viruses are the most numerous and most important pathogens and are emphasized in this course in lecture and clinical case studies, fungi and protozoa are also included. The goal of this course is *to provide a foundation of concepts* in host-microbe interactions that will allow students to understand the diseases facing humans today and be prepared for the diseases coming tomorrow.

Medical Microbiology is an advanced course and will be taught at a rigorous level. Most of the students who take this course are interested in pursuing a career in health related fields or are graduate students in microbiology and are ready for a course that requires synthesis, integration, and application.

**B. Course logistics.**

Lectures meet Mon. and Wed from 10-10:50 pm in BR 201. Laboratories meet Mon. and Wed from 12-1:50 and 2-3:50 pm in BR 129. There will be some Tues., especially during the clinical case portion of the course, when the student or their lab/group partner(s) will need to check laboratory test results.

**Course instructor**: Dr. Elizabeth Alm

**Office hours**: Office hours will be posted on Blackboard. I will have a sign-up sheet outside Brooks 157.

**E-mail**: alm1ew@cmich.edu (Note: this is the easiest way to reach me). If you have a BIO580 question, put "BIO580" as the beginning of the subject line of your e-mail message. I get about 100 e-mail a day, much junk that I trash in batches. If you fail to include this header I may accidentally trash your e-mail.

Example:

To: Elizabeth.W.Alm <alm1ew@cmich.edu>

From: Susan B. Student <stude1sb@cmich.edu> Subject: BIO580: questions on today’s lecture

**Prerequisites**: BIO 208 (Microbiology) and physiology. BIO 324 (Cell Biology) is also recommended.

**C. Required materials**

**Textbook:** Goering, Dockrell, Zuckerman, Roitt, and Chiodini (2013) *Mim’s Medical Microbiology 5th Ed*., Elsevier. ISBN:978-0-7234-3601-0.

**Lab Manual:** Alm (2013) Laboratory Manual of Diagnostic Microbiology. Course Pak.

**Lecture Notes**: Posted under Course Materials on Blackboard

**Access to Internet, Blackboard, and an E-mail account.** I will be posting many class materials on Blackboard, and expect every student to check for announcements/assignments a couple times a week. I can be reached more easily by e-mail than by any other method, and will reply to any concern or question you raise if you reach me by e-mail.

**D. Laboratory**

All organisms handled in the laboratory have the potential to cause illness, especially in compromised individuals (at least half of the microbes are classified as Biological Safety Level 2). Compromising conditions include cancer, chemotherapy, diabetes, HIV positivity, open wounds, pregnancy, steroid use, etc. See me if you have concerns about your safety in laboratory. All inquiries will be confidential.

**E. Clinical Cases**

Three important skills in medical microbiology are problem-solving, interacting with other professionals, and written communication skills. Development of these skills is an objective in this course. Written communication skills will be developed throughout the semester in concept checks and essay exam questions. Problem-solving and team work skills will especially be emphasized in the second half of the semester. For the first half of the semester, both the lecture and laboratory will emphasize basic concepts and foundational techniques. After Midterm, skill sets will be integrated by way of clinical cases. Clinical cases will be handed out in lecture at the beginning of the week. Cases will be accompanied by a clinical sample that you will work with in the laboratory. Case reports will be collected and graded rigorously.

**F. Late policy – to receive full credit, all assignments must be turned in on time.**

**G. Reading**

Readings and lectures will complement each other — I cannot cover every detail in lecture, and I will expect you to obtain information from reading the text in addition to lecture. Don't fall behind! Try to read the assignment before each class, but at the very least read it on the same day as the class.

**H. Grades**

|  |  |  |
| --- | --- | --- |
|  **Grading**: | Undergraduates | Graduates\*\* |
| 1st halfQuizzes  | 5% | 3% |
| Concept checks  | 10%  | 7% |
| Test One  | 15%  | 15% |
| Test Two  | 20% | 20% |
| 2nd halfQuizzes  | 10% | 5% |
| Case Reports | 25% | 25% |
| Comprehensive Final | 15% | 15% |
| Additional Required Elements |  none | 10% |

\*\* Expectations for graduate student performance will be higher, in accordance with their advanced academic standing

**Grading Scale**:

|  |  |
| --- | --- |
| 94+ = A | 80-83.9 = B- |
| 90-93.9 = A- | 77-79.9 = C+ |
| 87-89.9 = B+  | 74-76.9 = C |
| 84-86.9 = B | 70-73.9 = C- |

**H. Students requiring accommodations**

CMU provides students with disabilities reasonable accommodation to participate in educational programs, activities or services. Students with disabilities requiring accommodation to participate in class activities or meet course requirements should first register with the office of Student Disability Services (250 Foust Hall, telephone #989-774-3018), and then contact me as soon as possible.

**I. Makeup policy**

Makeup exams are available only to students who have a legitimate excuse for missing an exam, such as professional school interview, presentation at a scientific conference, sanctioned athletic team event out of town, personal illness or injury, or death in the immediate family. If you know in advance that you must miss an exam, see me in advance and bring documentation to support your anticipated absence. If you miss an exam unexpectedly because of last-minute illness or accident, contact me by e-mail or phone as soon as possible with documentation of your situation. Make-ups for the final exam will be scheduled for Friday of exam week.

**J. How to succeed in this course**

As you proceed upward in course level difficulty you assume greater responsibility for your own learning. The ultimate goal is to become an independent learner and critical thinker.

In order to succeed in this course you should plan to attend all lectures and allow ample time to read and study assigned material. You will get more out of lectures if you read (or at least skim) the assigned readings before lecture and then reread relevant material carefully soon after lecture.

Two hours study time for each hour of class time is a minimum requirement for most students to perform satisfactorily (B level). If you desire an "A", you will probably need to put in more than this minimum recommendation. If you begin to fall behind, make every effort to catch up quickly; this course is progressive and you may soon find yourself swamped with too much material to assimilate before a test.

Many of you will find that careful attention in class, reading the text, and thoughtfully completing the concept checks is all the support you will need to do well in the course. If you have difficulties with some of the material in this course, I offer several forms of assistance:

1. I will be happy to repeat information and/or answer questions during lecture, please do not hesitate to ask me to do so. Also feel free to e-mail questions to me at any time.
2. The textbook provides a list of key facts at the end of each chapter for review. There is also a web site associated with the text (student consult.com) that will allow you to take quizzes over the material. See the inside cover of your text for more information.
3. A course web page (which will be linked in Blackboard) will contain links to additional internet resources, <http://www.cst.cmich.edu/users/alm1ew/medimicro.html>.
4. There is a Facebook group for BIO 580 Medical Microbiology at CMU.
5. I am available for individual consultation regarding any aspect of the course. If you have unanswered questions or concerns, or are in serious academic trouble, see me! I will provide whatever assistance I can to help you do well in this course; however, ultimately the grade you earn is your responsibility.

**Tentative schedule - any schedule changes will be posted on Blackboard**

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| --- | --- | --- | --- |
| **DATE** | **LECTURE TIME**  | **READING** | **LABORATORY TIME** |
| MAug 25 | Course introduction; Dynamics of infectious disease | pp. xi-xivCh. 3, 2 | **UNIT 1 - THE PLAYERS****Part A – The Pathogens**Lecture Viruses  |
| WAug 27 | Bacteria | Ch. 4-8 | Lecture Euk pathogens and intro to clinical cases**QUIZ 1- Review of Microbes - Take Home**  |
| M Sep 1 | ***Labor Day – No Class*** |
| WSep 3 | Quiz 1 due 10 am**Part B – The Host Defenses**Nonspecific host defenses against microbial invaders | Ch. 9 | Lab 1 – Gram stain and streak plate |
| MSep 8 | Nonspecific defenses continued |  | Lab 2 – Colony morphology |
| WSep 10 | Specific host defenses against microbial invaders | Ch. 10,11,14 | **QUIZ 2 – Nonspecific Defenses and Labs 1&2**Lab 3 – Initial sorting |
| MSep 15 | Specific defenses continued |  | Lab 4 – Gram positive cocci |
| WSep 17 | Specific defenses continued |  | GPC continued**Test One Essays – Take Home** |
| MSep 22 | Test One Essays due 10 am**Test One Multiple Choice, Short Answer – In class** |  | Lab 5 – Enterobacteriaceae |
| T |  |  | Check KIA results |
| WSep 24 | **UNIT 2- HOST AND PATHOGEN CONFLICTS**How are pathogens acquired and transmitted? | Ch. 12, 13 | Lab 5 - continued |
| MSep 29 | Acquisition and transmission continued |  | Lab 6 - Identification of Oxidase-positive, Gram-negative Rods  |
| WOct 1 | How do pathogens multiply and spread while avoiding host defenses | Ch. 15 | **QUIZ 3 – Acquisition, transmission/Labs 3-5**Lab 6 – continuedLab 7 – Identification of Gram-negative CocciLab 8 – Identification of Gram-positive Rods |
| MOct 6 | continued | Ch. 16 | Lab 9 – Introduction to Anaerobes Bacterial Unknown assigned to Honors/Grads |
| WOct 8 | What are the pathological consequences of infection? | Ch. 17 | **QUIZ 4 – Avoiding host defenses/Labs 6-8**Lab 9 - continued  |
| MOct 13 | continued |  | Lab 10 – Intro to Fungi |
| W Oct 15 | continued |  | **QUIZ 5 – Pathology/Labs 9-10**Test Two Essays – Take Home |
| MOct 20 | Test Two Essays due 10 am**Test Two Multiple Choice, Short Answer – In class** |  | No lab |
| **DATE** | **LECTURE TOPIC** | **READING** | **Laboratory and/or Clinical Case** |
| WOct 22 | **UNIT 3 – CLINICAL MANIFESTATIONS OF INFECTION BY BODY SYSTEM**Upper Respiratory Tract Infections | Ch. 18 | How to work up clinical unknowns |
| MOct 27 | Lower Respiratory Tract Infections, Case 1 assigned | Ch. 19 | Lab 11 - Clinical specimen received |
| T-F | Continue working on cases, no W lecture | Work on solving cases |
| MNov 3 | Clinical Case 1 due 10am**QUIZ 6 - RTI**Urinary Tract Infections and Sexually Transmitted Infections; Case 2 assigned | Ch. 20, 21  | Lab 12 - Clinical specimen received |
| T-F | Continue working on cases, no W lecture | Work on solving cases |
| MNov 10 | Clinical Case 2 due 10am**QUIZ 7 – UTI and STI**Gastrointestinal Infections; Case 3 assigned | Ch. 22 | Lab 13 - Clinical specimen received |
| T-F | Continue working on cases, no W lecture | Work on solving cases |
| MNov 17 | Clinical Case 3 due 10am**QUIZ 8 - GI**Nervous System Infections; Case 4 assigned | Ch. 24 | Lab 14 - Clinical specimen received |
| T-F | Continue working on cases, no W lecture | Work on solving cases |
| MNov 24 | Clinical Case 4 due 10am**QUIZ 9 - NS**Infections of Skin and Wounds; Case 5 assigned | Ch. 26 | Lab 15 - Clinical specimen received |
| T-W | Continue working on cases, no W lecture |  | Work on solving cases |
| R Nov 27 | ***Thanksgiving*** |  |
| MDec 1 | **UNIT 4 – CONTROL OF INFECTIONS****QUIZ 10 – Skin and Wounds**Chemotherapy | Ch. 33 | Lecture - Antibiotic resistanceLab 16 - Antimicrobial Susceptibility Testing |
| T Dec 2 |  | Check lab results |
| WDec 3 | Clinical Case 5 due 10amVaccinations | Ch. 34 | Lab 16 - continued |
| **M****Dec 8** | **FINAL EXAM****Comprehensive with emphasis on Units 3 and 4****BR 201 10:00am – 11:50am** |  |  |