Syllabus for BMS 127, Medical Microbiology, Spring 2018

CRN 63217: Lecture M,W 12:45–2:05, EBS 301; Lab M 2:30–5:35, EBS 313

CRN 63218: Lecture M,W 12:45–2:05, EBS 301; Lab W 7:50–10:55, EBS 313

CRN 64098: Lecture M,W 12:45–2:05, EBS 301; Lab W 2:30–5:35, EBS 313

**Instructor:** Email: rhfischer@sbcc.edu Office Hours: M,W 11:30–12:30; R 5:00-6:00

Robbie Haines Fischer Phone: 805-730-8780 Office Location: EBS 314

**Required Texts:** Openstax *Microbiology* (2016) ISBN 1938168143. *https://openstax.org/details/microbiology*

SBCC, *Microbiology Reader* (available only at Campus Store)

SBCC, *Microbiology Lab Manual* (available only at Campus Store)

**Recommended Text:** Bauman’s *Microbiology with Diseases by Taxonomy*, used, any previous edition

**Course Description:** BMS 127 is a 4-unit, college-level course designed to meet the needs and interests of students of both health-related sciences and general biology. It includes investigations of bacteria, viruses, fungi, and protists, with emphases on microbe–host interactions and bacterial biology. This course also investigates the principles of disease transmission and prevention, virology, genetics, and immunology.

**Grades:** Please note that I will not “give” you a grade; I will merely report the grade that you earn. Your overall letter grade for the course will reflect the percentage of points that you accumulate. There is no curve. The best way to find out what you need to do to earn a particular grade is to keep track of your points as the semester progresses.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Point distribution | |  | Percentage earned | Grade |
|  | |  |  |  |
| 3 Lecture Midterm Exams | 300 |  | 97–100% | A+ |
| 1 Lecture Final Exam | 150 |  | 93–96% | A |
| 1 Vocabulary Quiz | 50 |  | 90–92% | A– |
| 7 Lab Quizzes/Assignments | 70 |  | 87–89% | B+ |
| 3 Lab Mini-Practicals | 20 |  | 83–86% | B |
| 1 Unknown Bacterium Project | 30 |  | 80–82% | B– |
| 10 Lecture Quizzes | 50 |  | 77–79% | C+ |
| 1 Lab Exam | 100 |  | 70–76% | C |
| Total points possible | 770 |  | 60–69% | D |
|  |  |  | 0–59% | F |

**Your Success:** My job in this course is to guide, challenge, and inspire you, not to simply present a stream of facts. Your job in this course is to work *diligently*, *creatively*, and *proactively* to learn the material, not to simply memorize everything I say. (Memorization is the lowest level of learning.) If I do my job, you will get a sense of how fascinating and relevant microbiology is; if you do your job, you will succeed in and enjoy this course.

**Study Tips:** You should not expect to do well in this course unless you follow this advice. The only difference between passing and failing this course is the amount and quality of work that you put into it. Although I will do everything I can to help you in this course, your grade is ultimately up to you.

* The very best way to study is to attempt to teach the material to someone else. Listening to and understanding information is *completely different* than being able to use it or reproduce it under pressure without your notes!
* You should budget into your schedule at least *three hours* of study and reading time for every one hour of lecture time. That’s a *minimum* of 8–9 hours every week, exclusive of exam and lab preparation.
* Read the assigned material casually before lecture, and then very carefully read the relevant sections a second time after the lecture. If you don’t understand something at that point, ask me.
* Take notes on your post-lecture reading, and incorporate these notes into your lecture notes. Re-write all your notes, cleaning up and re-organizing them as you do.
* Write tests for yourself to *evaluate* and *use* the material; take your tests later to practice doing well on exams.
* Join or form a study group. You’re more likely to study if it’s scheduled and others are depending on you. Plus, in a study group, you have people to whom you can teach the material. (See first bullet point.)
* Different techniques work for different people, so be creative and proactive in how you *use* the lecture material.

**Attendance and Make-up Policies:** *It is extremely difficult to earn a good grade in this class without attending every lecture and lab!* Although there are no points directly associated with attendance, you should consider each absence or tardiness to be a blow to your grade. You will be held responsible for all announcements made in class, even if you were absent that day. If you know in advance that you cannot be present for an exam—and it’s a dire situation that can be documented in writing—I *might* be able to reschedule the exam. I do not guarantee that, though, and each case is considered independently. *Quizzes will not be rescheduled under any circumstances*, and missed labs cannot be made up. Quizzes will be unannounced and will be given in the first ten minutes of lab. Those who are late will not be given extra time to complete them.

**Student Responsibilities:**

* It is your responsibility to keep track of all SBCC administrative deadlines (e.g. drop and withdraw dates, etc.).
* Disturbances to the learning environment will not be tolerated in lecture or lab.
* Phone and laptop use are strictly forbidden in lecture or lab. *Don’t even touch your phone while you are in the lab!*
* Treat email as the professional communication that it is. Complex or urgent topics should be handled in person.
* Your safety is taken very seriously. All laboratory safety procedures must be understood and followed at all times.
* Students with an immune-compromising medical situation (e.g. pregnancy, illness, medical treatment) must provide a written note from a licensed health care professional authorizing their participation in this course.

**Academic Honesty:** All instances of cheating, plagiarism, or any other form of academic dishonesty will be reported to the school’s administration. Consequences range from receiving an F for the assignment or exam to expulsion from the College. If you’re not sure what constitutes academic honesty for a particular situation, please ask me.

**Student Learning Outcomes:**

* Explain the basic structure, physiology, metabolism, and chemistry of human-associated microorganisms.
* Compare the pathogenesis of microorganisms, including virulence mechanisms and the human immune response.
* Characterize infectious diseases, including both clinical and epidemiological manifestations.
* Using the scientific method and critical thinking, analyze data generated by laboratory experiments.

**What is Learning?** Bloom’s Taxonomy is a commonly used classification of what actually constitutes learning. In it, learning objectives are listed from lowest- to highest-order processes. Questions addressing all of these will appear on quizzes and exams throughout this course. Note that memorization is the lowest level of learning. Although often necessary, memorization is rarely sufficient for learning and will not by itself earn anyone a good grade.

* Remembering—Memorize information.
* Understanding—Comprehend the meaning, translation, interpolation, and interpretation of instructions and problems. State a problem in one's own words.
* Applying—Use a concept in a new situation or unprompted use of an abstraction. Apply what was learned in the classroom into novel situations in the work place.
* Analyzing—Separate material or concepts into component parts so that its organizational structure may be understood. Distinguish between facts and inferences.
* Evaluating—Make judgments about the value of ideas or materials.
* Creating—Build a structure or pattern from diverse elements. Put parts together to form a whole, with emphasis on creating a new meaning or structure.

**Disclaimer:** The syllabus and schedule accurately represent my intentions for this course, but they are subject to change. Changes may include the addition of assignments and thus a change in the point distribution used to determine your grade. I will advise the class of any changes in a timely manner. *Being absent from class and missing any such announcements is not an excuse for being unaware of those announcements.*

**Keeping Track of Your Progress:**  To calculate your grade at any time, simply divide your score by the total points possible at that time, then multiply by 100 to get a percentage: your points / possible points x 100 = your grade.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | points | your score |  |  | points | your score |  |  | points | your score |
| Lecture Quiz #1 | 5 |  |  | Lab Quiz #1 | 10 |  |  | Vocabulary Quiz | 50 |  |
| Lecture Quiz #2 | 5 |  |  | Lab Quiz #2 | 10 |  |  | Gram Stain Practical | 6 |  |
| Lecture Quiz #3 | 5 |  |  | Lab Quiz #3 | 10 |  |  | Streak Practical | 8 |  |
| Lecture Quiz #4 | 5 |  |  | Lab Quiz #4 | 10 |  |  | Pipetting Practical | 6 |  |
| Lecture Quiz #5 | 5 |  |  | Lab Quiz #5 | 10 |  |  | Unknowns Project | 30 |  |
| Lecture Quiz #6 | 5 |  |  | Lab Quiz #6 | 10 |  |  | Lab Final Exam | 100 |  |
| Lecture Quiz #7 | 5 |  |  | Lab Quiz #7 | 10 |  |  | Lecture Final Exam | 150 |  |
| Lecture Quiz #8 | 5 |  |  | Lecture Midterm #1 | 100 |  |  |  |  |  |
| Lecture Quiz #9 | 5 |  |  | Lecture Midterm #2 | 100 |  |  | **Total Points** | **770** |  |
| Lecture Quiz #10 | 5 |  |  | Lecture Midterm #3 | 100 |  |  |  |  |  |

**BMS 127 Medical Microbiology Spring 2018**

**Lecture Schedule and Reading Assignments**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Lect #** |  | Date |  | Topic |  | **Reading** |
|  |  | 15 Jan |  | — Holiday, no class — |  | — |
| 1 |  | 17 Jan |  | Introduction, Overview and History of Microbiology |  | Chs. 1, 3 |
| 2 |  | 22 Jan |  | Chemistry of Life |  | Ch. 7 |
| 3 |  | 24 Jan |  | Genetic Code, Gene Expression I |  | Ch. 10, 11 |
| 4 |  | 29 Jan |  | Gene Expression II |  | Ch. 10, 11 |
| 5 |  | 31 Jan |  | Taxonomy, Cell Structure I |  | Chs. 1, 3–5 |
| 6 |  | 5 Feb |  | Cell Structure II |  | Chs. 1, 3–5 |
|  |  | 7 Feb |  | **MID-TERM #1 (lectures 1–6)** |  | — |
| 7 |  | 12 Feb |  | Viruses |  | Ch. 6 |
| 8 |  | 14 Feb |  | Viral Diseases I |  | Chs. 21–26 |
|  |  | 19 Feb |  | — Holiday, no class — |  | — |
| 9 |  | 21 Feb |  | Viral Diseases II |  | Chs. 21–26 |
| 10 |  | 26 Feb |  | Metabolism |  | Ch. 8 |
| 11 |  | 28 Feb |  | Growth and Reproduction I |  | Ch. 9 |
| 12 |  | 5 Mar |  | Growth and Reproduction II |  | Ch. 9 |
|  |  | 7 Mar |  | **MID-TERM #2 (lectures 7–12)** |  | — |
| 13 |  | 12 Mar |  | Innate Immunity |  | Ch. 17 |
| 14 |  | 14 Mar |  | Adaptive Immunity |  | Ch. 18 |
| 15 |  | 19 Mar |  | Adaptive Immunity and Immunization |  | Ch. 18 |
| 16 |  | 21 Mar |  | Host–microbe Interactions, Mutualism |  | — |
|  |  |  |  | — *SPRING BREAK* — |  | — |
| 17 |  | 2 Apr |  | Host–microbe Interactions, Virulence I |  | Chs. 15, 16 |
| 18 |  | 4 Apr |  | Host–microbe Interactions, Virulence II |  | Chs. 15, 16 |
|  |  | 9 Apr |  | **MID-TERM #3**  **(lectures 13–18)** |  | — |
| 19 |  | 11 Apr |  | Prokaryotic Genetics |  | — |
| 20 |  | 16 Apr |  | Eukaryotic Pathogens I |  | Chs. 21–26 |
| 21 |  | 18 Apr |  | Eukaryotic Pathogens II |  | Chs. 21–26 |
| 22 |  | 23 Apr |  | Prokaryotic Pathogens I |  | Chs. 21–26 |
| 23 |  | 25 Apr |  | Prokaryotic Pathogens II |  | Chs. 21–26 |
| 24 |  | 30 Apr |  | Prokaryotic Pathogens III |  | Chs. 21–26 |
| 25 |  | 2 May |  | Epidemiology |  | Ch. 16 |
|  |  | 7 May |  | **FINAL EXAM (cumulative!) 11:00 a.m.–1:00 p.m.** |  |  |

**BMS 127 Medical Microbiology Spring 2018**

**Lab Schedule**

|  |  |  |
| --- | --- | --- |
| **Week/Date** | **Monday** | **Wednesday** |
| Week 1  22, 24 Jan | Lab Introduction and Safety  The Scientific Method | Lab Introduction and Safety  The Scientific Method |
| Week 2  29, 31 Jan | Microscopy  Aseptic Technique  Culturing and Pure Culture  **Vocabulary Quiz** | Microscopy  Aseptic Technique  Culturing and Pure Culture  **Vocabulary Quiz** |
| Week 3  5, 7 Feb | Smears  Staining | Smears  Staining |
| Week 4  12, 14 Feb | Enumeration  Water Testing | Enumeration  Water Testing |
| Week 5  19, 21 Feb | — HOLIDAY — | Protists |
| Week 6  26, 28 Feb | Bacteriophages  Plaque Assay | Bacteriophages  Plaque Assay |
| Week 7  5, 7 Mar | Unknown Project I   * Diagnostic Media * Streak Isolation | Unknown Project I   * Diagnostic Media * Streak Isolation |
| Week 8  12, 14 Mar | Unknown Project II   * Additional Media * Culture Characteristics | Unknown Project II   * Additional Media * Culture Characteristics |
| Week 9  19, 21 Mar | Unknown Project III   * Additional Tests and Stains * Researching Candidates | Unknown Project III   * Additional Tests and Stains * Researching Candidates |
| Week 10 | — *SPRING BREAK* — | |
| Week 11  2, 4 Apr | Controlling Microbial Growth I   * Temperature * Osmotic Pressure * Radiation   **Streak Isolations due** | Controlling Microbial Growth I   * Temperature * Osmotic Pressure * Radiation   **Streak Isolations due** |
| Week 12  9, 12 Apr | Controlling Microbial Growth II   * Culture and Sensitivity * Antiseptics and Disinfectants   **Unknown Results Due** | Controlling Microbial Growth II   * Culture and Sensitivity * Antiseptics and Disinfectants   **Unknown Results Due** |
| Week 13  16, 18 Apr | Transformation | Transformation |
| Week 14  23, 25 Apr | PCR I  **Gram Stain Practical** | PCR I  **Gram Stain Practical** |
| Week 15  30 Apr, 2 May | PCR II  **Pipetting Practical** | PCR II  **Pipetting Practical** |
| Week 16  7, 9 May | **Comprehensive Lab Practical** | **Comprehensive Lab Practical** |