Introduction to Microbiology (BIOL 2320)

Credit: 3 semester credit hours (3 hours of lecture)

Prerequisite/Co-requisite: Must be enrolled in BIOL 2120 at the same time

Course Description

Study of cell types and structure also, microbial growth, control, metabolism, and genetic. This course provides information about microbes and human interactions, microbial pathogen and human diseases, and Health.

Recommended Textbook and Materials:

Microbial Fundamentals: A Clinical Approach, McGraw-Hill Publishing, Second edition or most current edition, by Marjorie Kelly Cowan. **ISBN 978-0-07-802104-6**

Microbiology, An Introduction, Pearson publishing, 12th edition, by Tortora, Funke, and Case, Publishing. **ISBN: 978-0-321-92915-0**

Course Objectives

Upon completion of the course, the student will be able to:

1. Identify and describe groups of microbes including prokaryote microbes, eukaryote microbes, and viruses.
2. Explain differences between prokaryotic and eukaryotic cells.
3. Understand importance of microorganisms on agriculture, environment, and human health.
4. Demonstrate microbial metabolism and genetics.
5. Describe interaction between microbes and human, and understand the mechanisms of pathogenesis, diseases transmission, spread, and control.
6. Describe host defense and immunity.
7. Understand microbial growth, manipulation of microorganisms, and control.

Core Objectives

1. Critical thinking skills and problem solving skills to make decision in the laboratory.
2. Communication skills to effectively develop, interpret, and express the ideas and results of scientific investigations.
3. Quantitative skills to investigate and analysis data and use scientific tools in the laboratory to collect data.

Course Outline

A. Fundamental of Microbiology
    1. Naming and Classifying Microorganisms
    2. History of Microorganisms
    3. Microbes and Human Benefits
    4. Microbes and Human Disease
B. Microorganisms Culturing and Microscopy
C. Prokaryotic Cells (Bacteria – Archaea)
    1. Bacteria
    2. Archaea
D. Eukaryotic Cells and Microorganisms
    1. Eukaryotic Microorganisms
    2. Structure of the Eukaryotic Cells
    3. Fungi
    4. The Protists
    5. Helminths
E. Viruses
    1. Introduction of Viruses
    2. Structure of Viruses
    3. Viral Multiplication
    4. Viruses and Host Cell
    5. Viruses and Cancer
    6. Bacteriophage
    7. Techniques in Cultivating and Identifying
    8. Noncellular Infectious Agents
    9. Viruses and Human Health
F. Microbial Metabolism
    1. Metabolism of Microbes
    2. Energy
    3. Catabolism
    4. Biosynthesis
G. Microbial Growth and Control
    1. Microbial Nutrition
    2. Microbes and Environmental Factors
    3. Microbial Growth
    4. Controlling Microbial Growth
H. Microbial Genetics
    1. Genetics and Genes
    2. Replication
    3. Transcription

4. Translation
5. Genetic Regulation
6. DNA Recombination
7. Mutations
8. Genetic Engineering

I. Host Defenses
   1. Defenses Mechanisms of The Host
      a. First Line of Defenses, Barriers
      b. Second Line of Defenses, Immune Defense
      c. Third Line of Defenses, Specific Immunity
   2. Adaptive Immunity

J. Disorder in Immunity
   1. Hypersensitivity (Primary and Secondary)
   2. Hyposensitivity (type I, II, III, and IV)

K. Antimicrobial Treatment
   1. Antimicrobial activity
   2. Microbe and Host Interactions

Grade Scale

A	900 – 1000 points
B	800 – 899 points
C	700 – 799 points
D	600 – 699 points
F	599 or below

Course Evaluation

Final Grades will be calculated according to the following criteria:

1. 4 Units Exams	60%
2. 5 Online Quizzes	20%
3. Current Event (A scientific Paper)	10%
4. Group Presentation	10%

Course Requirements

1. Be prepared to complete:
2. Reading and writing assignments
3. Class activity
4. Quizzes
5. Research current event with presentation (Power Point) - *Assigned topics*
6. Major Exams

Course Policies

1. No food or drinks, or use of tobacco products in class.
2. Beepers, telephone, headphones and any other electronic devices must be turned off while in class.
3. Do not bring children to class.
4. No late assignment will be accepted. All assignments are due when stated. Be ready (have things printed out and stapled and ready to turn in)
5. Students that miss a test or quiz are not allowed to make up the test or quiz. Student that miss a test will receive a grade of '0'.
6. There are no make-ups for either a missed test or a missed quiz. The lowest quiz test grade and the lowest quiz grade will be automatically dropped.
7. Attendance policy. Two absents are allowed. If a student is tardy to class or departs early (3) times, it will be equal to one (1) absence. Each absence beyond two absences wil result in a 5 point deduction from your final grade.
8. If you wish to drop a course, the student is responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an 'F' in the course.
9. In the event that LIT is forced to cancel classes due to inclement weather, DMS classes and clinical rotations will also be canceled. Notification of closures will be made through local radio and TV stations. Students out of the immediate broadcast area should contact either their instructor or the program director.
10. Students are responsible for material in instructor Power Points, handouts and on videos found on the course website. Exam questions may come from this material.

Academic Dishonesty

Cheating and Plagiarism are two types of academic dishonesty.
Cheating is taking an examination or test in a dishonest way, as by improper access to answers. Plagiarism is taking someone else's work and misrepresenting it as your own.
Student's work should always be his/her own unless participating in a group project.
Cheating and/or plagiarism will result in disciplinary action; i.e., zero on assignment/exam or an **F** in the course, expulsion, etc.

Students with Disabilities:

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator, (409) 880-1737 or visit the office located in the Cecil Beeson Building.

Course Calendar - Course Schedule (Tentative)

Week

Course Schedule (Tentative)*

Week of	Topic	Reference
Aug. 22	Course Overview and Introduction Ch 1(Fundamental of Microbiology)	Textbook
Aug.29	Ch 1(Fundamental of Microbiology) **Quiz 1** (over Ch 1)	Textbook
Sep. 5	Ch 3 (Microscopy and Identification of Microbes) Ch 3 (Microscopy and Identification of Microbes)	Textbook
Sep. 12	Ch 4 (Prokaryote Microorganisms) Ch 4 (Prokaryote Microorganisms)	Textbook
Sep. 19	Ch 4 and Ch 12 (Eukaryotic Microorganisms) **EXAM I** (Over Ch 1, 3, 4, and 12)	Textbook
Sep. 26	Ch 13 (Virus) **Quiz 2** (Over Ch 13) **Papers Due**	Textbook
Oct. 3	Ch 5 (Microbial Metabolisms) Ch 5 (Microbial Metabolisms)	Textbook
Oct. 10	Ch 5 (Microbial Metabolisms) **EXAM II** (Over13, and 5)	Textbook
Oct. 17	Ch 6 (Microbes Growth) Ch 7 (Microbes Control)	Textbook
Oct. 24	**Quiz 3** (Over Ch 6 and 7) Ch 8 (Microbial Genetics)	Textbook
Oct. 31	Ch 8 (Microbial Genetics) Ch 8 (Microbial Genetics)	Textbook
Nov. 7	**EXAM III** (Over Ch 6, 7, and 8) Ch 16, 17 (Host Defense)	Textbook
Nov. 14	Ch 16, 17 (Host Defense) **Quiz 4** (Over Ch 16 and 17)	Textbook
Nov. 21	Ch 19 (Disorder in Immunity) Ch 20 (Antimicrobial Treatment)	Textbook
Nov. 28	**Quiz 5** (Over Ch 19 and 20) Holiday (Campus Closed)	Textbook
Dec. 5	Group Presentations (finish up everything/ review for Final) **Final EXAM, Dec. 8**	Review Final Exam

Contact Information:

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Office Hours: see the door schedule
(Or by appointment)