MICRO 5 Course Outline as of Summer 2007

CATALOG INFORMATION

Dept and Nbr: MICRO 5 Title: GENERAL MICROBIOLOGY
Full Title: General Microbiology
Last Reviewed: 8/14/2023

Units		Course Hours per Week		Nbr of Weeks	Course Hours Total	
Maximum	5.00	Lecture Scheduled	3.00	17.5	Lecture Scheduled	52.50
Minimum	5.00	Lab Scheduled	6.00	6	Lab Scheduled	105.00
		Contact DHR	0		Contact DHR	0
		Contact Total	9.00		Contact Total	157.50
		Non-contact DHR	0		Non-contact DHR	0

Total Out of Class Hours: 105.00 Total Student Learning Hours: 262.50

Title 5 Category:	AA Degree Applicable
Grading:	Grade Only
Repeatability:	00 - Two Repeats if Grade was D, F, NC, or NP
Also Listed As:	
Formerly:	

Catalog Description:
Physiology and genetics of micro-organisms with emphasis on bacteria. Principles of host-parasite interaction.

Prerequisites/Corequisites:
Completion of CHEM 60 or higher and completion of BIO 10.

Recommended Preparation:
Elibility for English 1A

Limits on Enrollment:

Schedule of Classes Information:
Description: Physiology, genetics, and toxonomy of micro-organisms with emphasis on bac teria. Principles of host-parasite interaction. (Grade Only)
Prerequisites/Corequisites: Completion of CHEM 60 or higher and completion of BIO 10.
Recommended: Elibility for English 1A
Limits on Enrollment:
Transfer Credit: CSU;UC. (CAN BIOL14)
Repeatability: Two Repeats if Grade was D, F, NC, or NP

ARTICULATION, MAJOR, and CERTIFICATION INFORMATION:

AS Degree:	**Area**		Effective:	Inactive:
	C	Natural Sciences	Fall 1981	
CSU GE:	**Transfer Area**		Effective:	Inactive:
	B2	Life Science	Fall 1981	
	B3	Laboratory Activity		
IGETC:	**Transfer Area**		Effective:	Inactive:
	5B	Biological Sciences	Fall 1981	
	5C	Fulfills Lab Requirement		

CSU Transfer:	Transferable	Effective:	Fall 1981	Inactive:
UC Transfer:	Transferable	Effective:	Fall 1981	Inactive:

CID:

Certificate/Major Applicable:
Major Applicable Course

COURSE CONTENT

Outcomes and Objectives:
Upon successful completion of this course students will be able to:
1. Outline the history of major microbiological discoveries and describe their contributions to world civilization.
2. Describe the steps in the scientific method.
3. Relate basic principles of chemistry and cell biology to microbes.
4. Describe the unique structures and mechanisms of microbial genetics.
5. Categorize microbes taxonomically and evolutionarily.
6. Describe viruses and their relation to cells.
7. Compare various mechanisms of pathogenicity.
8. Describe the function of the immune system and its relation to disease.
9. Perform a variety of microbiological laboratory techniques.

Topics and Scope:

I. Historical development
   A. The pre-microbial world
   B. Discovery of microbial world, development of the microscope
   C. Spontaneous generation and pleiomorphism
   D. Koch's postulates
   E. Contribution of biochemistry and molecular biology to microbiology
   F. Contribution of microbiology to world civilization
II. Cell biology
   A. Chemistry and biochemistry review
   B. Lipids, membranes and cells
   C. DNA, RNA, Protein: structure and functions

D. ATP synthesis and cell work
E. The eucaryotic cell - structure and function
F. The procaryotic cell - structure and function

III. Methodology
A. Steps of the scientific method
B. Methods of sterilization: heat and filtration
C. Media and their construction and utilization
D. Methods of obtaining pure cultures
E. Staining and microscopy
F. Analysis and manipulation of growth: the standard curve
G. Enrichment culture
H. Fermentation: theory and practice
I. Isolation of mutants and recombinants
J. Virus titration

IV. Microbial genetics
A. Genome and phenotype
B. Mutation, selection, adaptation
C. Recombination
1. mobile genetic elements: virus, plasmid
2. enzymes and mechanisms
3. isolation and identification of recombinants
D. The environment and the genome

V. Virus
A. Definitions and historical background
B. Interactions with cells
C. Viral disease
1. vaccination and treatment
2. small pox and polio
3. HIV disease

VI. Taxonomy
A. Problems intrinsic to taxonomy
B. Traditional versus modern approaches
C. Taxonomy of selected groups

VII.Symbiosis
A. Evolutionary origins.
B. Specific types: nitrogen fixation, cellullose disgestion
C. Impact on model of infectious disease

VIII.Infectious disease
A. Role of normal flora
B. Mechanisms of pathogenicity
C. Epidemiology
D. Role of the host in disease
1) Non-specific resistance
2) Immune system
3) Factors influencing host resistance
E. Vaccination

IX. Applied microbiology
A. Modern biotechnology or "genetic" engineering
B. Enrichment culture in biotechnology
C. Traditional enrichment and fermentation biology

Assignment:

1. Reading assignments from text, averaging one chapter per week; additional reading assignments averaging 5-10 pages per week.
2. Laboratory experiments, data collection, demonstration of sterile and culture technique.
3. Lab reports: 6-8 per semester, averaging 2-3 pages.
4. Examinations: 2-4 lecture exams and a final exam.

Methods of Evaluation/Basis of Grade:

Writing: Assessment tools that demonstrate writing skills and/or require students to select, organize and explain ideas in writing.

Lab reports	Writing 10 - 30%

Problem Solving: Assessment tools, other than exams, that demonstrate competence in computational or non-computational problem solving skills.

None	Problem solving 0 - 0%

Skill Demonstrations: All skill-based and physical demonstrations used for assessment purposes including skill performance exams.

Sterile and culture technique	Skill Demonstrations 5 - 10%

Exams: All forms of formal testing, other than skill performance exams.

Multiple choice, Completion, Essay	Exams 60 - 80%

Other: Includes any assessment tools that do not logically fit into the above categories.

None	Other Category 0 - 0%

Representative Textbooks and Materials:
Microbiology: An Introduction, 8th edition, by G.J. Tortora, B.R. Funke and C.L. Case, 2004
Microbiology: A Human Perspective by E.W. Nester, C.E. Roberts, M.T. Nester, D.G. Anderson, 2005
Instructor prepared lab manual