

## FLORIDA STATE COLLEGE AT JACKSONVILLE

## COLLEGE CREDIT COURSE OUTLINE

COURSE NUMBER: MCB 2010C

COURSE TITLE: Microbiology

PREREQUISITE(S): CHM 1020, CHM 1025C, CHM 1032C or CHM 2045C  
or other College level chemistry course

COREQUISITE(S): None

CREDIT HOURS: 4

CONTACT HOURS/WEEK: 6

CONTACT HOUR BREAKDOWN:

Lecture/Discussion: 3

Laboratory: 3

Other \_\_\_\_\_:

FACULTY WORKLOAD POINTS: 5.1

STANDARDIZED CLASS SIZE  
ALLOCATION: 24

## CATALOG COURSE DESCRIPTION:

This course is a study of microscopic forms of life including bacteria, viruses, fungi, protozoa and helminthes of medical and economic importance. Laboratory work will include microscopy and staining, aseptic transfer and culture techniques and biochemical tests for microbial identification. Recommended: Successful completion of BSC 1005, BSC 2010C, or BSC 2085C/2086C.

SUGGESTED TEXT(S): Norton, Cynthia Friend: Microbiology, Latest Edition

Tortora, Funke & Case. Microbiology - An Introduction, Benjamin Cummings, Latest Edition

Talaro, K.P. Foundations in Microbiology: Basic Principles, McGraw-Hill, Latest Edition

Leboffee, M.J. and B.E. Pierce. Photographic Atlas for the Microbiology Laboratory, Morton Publishing, Latest Edition

Leboffee, M.J. and B.E. Pierce. Microbiology Laboratory Theory and Application, Morton Publishing, Latest Edition.

SUGGESTED TEXT (S):

Cowan and Talaro, Microbiology: A Systems Approach,  
Mcgraw-Hill, 1<sup>st</sup> Edition.

IMPLEMENTATION DATE:

November 14, 1987

REVIEW OR MODIFICATION DATE:

Fall Term, 2003 (20041)

Fall Term, 2006 (20071)

Fall Term, 2008 (20091) - Outline Review 2007

COURSE TOPICS	CONTACT HOURS <u>PER TOPIC</u>
I. Introduction to Microbiology	1
II. Review of Chemistry A. Chemical bonding and reactions B. Organic molecules 1. Carbohydrates 2. Lipids 3. Proteins 4. Nitrogenous Bases	3
III. Cell structure A. Prokaryotic Cells B. Eukaryotic Cells	3
IV. Metabolism A. Enzyme function B. Catabolism 1. Respiration 2. Fermentation 3. Photosynthesis C. Anabolism	4
V. Bacterial Growth A. Physical factors of growth B. Chemical factors of growth C. Culture media and characteristics D. Bacterial growth curve E. Enumerating microorganisms	4
VI. Genetics A. Replication of DNA B. Protein Synthesis C. Mutation D. Gene Transfer E. Genetic Engineering	5
VII. Microbial control A. Physical methods of control B. Chemical methods of control C. Chemotherapy (antibiotics)	5
VIII. Viruses A. Classification B. Anatomy C. Life Cycles	3

COURSE TOPICS (CONTINUED)	<u>CONTACT HOURS PER TOPIC</u>
IX. Eukaryotic microorganisms	2
A. Algae	
B. Fungi	
C. Protozoa	
D. Helminths	
X. Host/Microbe Interactions	3
A. Types of symbiotic relationships	
B. Normal flora	
C. Factors of pathogenicity	
D. Mechanisms of invasiveness	
E. Toxin formation	
1. Exotoxins	
2. Endotoxins	
F. Epidemiology	
XI. Nonspecific defense mechanisms	2
XII. Specific Immunity	4
A. Antigens	
B. Antibodies	
C. Humoral Immune System	
D. Cellular Immune System	
E. Adverse reactions of the Immune System	
XIII. Diseases	6
A. Integumentary System	
B. Respiratory System	
C. Genitourinary System	
D. Cardiovascular System	
E. Digestive System	
F. Nervous System	
TOTAL HOURS:	45

LABORATORY TOPICS	CONTACT HOURS <u>PER TOPIC</u>
I. Introduction and Lab Safety A. Biosafety Level 2 Hazards B. Disposal of Cultures C. Spill protocol D. Handwashing	3
II. Microscopy A. Introduction to the Compound Microscope B. Use and care of the microscope C. Oil Immersion Technique	3
III. Aseptic Technique A. Culture methods B. Streak plate C. Colony morphology	3
IV. Staining techniques, (Exercise or demonstration)      6 A. Simple stain B. Gram stain C. Endospore stain D. Acid fast stain E. Negative stain F. Flagellar stain G. Capsule stain	6
V. Serial Dilutions and Organism Enumeration A. Colony count B. Calculations C. TNTC	3
VI. Control of Microorganisms A. Disinfectants and antiseptics B. Ultraviolet radiation C. Thermal death point D. Antibiotic sensitivity	3
VII. Selective and Differential Culture Media A. MacConkeys B. Eosin Methylene Blue C. Mannitol Salt agar D. Blood agar E. Other media at instructor's discretion	3

## LABORATORY TOPICS (CONTINUED)

CONTACT HOURS  
PER TOPIC

VIII. Selected Chemical Tests for Microorganisms	6
A. Carbohydrate fermentation	
B. H <sub>2</sub> S gas production	
C. MRVP	
D. Citrate utilization	
E. Urea hydrolysis	
F. Catalase	
G. Other tests at instructor's discretion	
IX. Identification of Unknown Bacterium	6
X. Survey of Microorganisms	3
XI. Other labs according to the interest of the instructor and needs of the class	6
Total Hours	45



<b>Course Prefix and Number:</b> MCB 2010C	<b>Semester Credit Hours:</b> 4
<b>Course Title:</b> Microbiology	

Discipline Area for the Course:

<input type="checkbox"/> <b>Communication</b>	<input type="checkbox"/> <b>Mathematics</b>	<input type="checkbox"/> <b>Social &amp; Behavioral Sciences</b>
<input type="checkbox"/> <b>Humanities &amp; Visual/Performing Arts</b>	<input checked="" type="checkbox"/> <b>Natural Sciences</b>	<input type="checkbox"/> <b>Other-Designated Option</b>

INTELLECTUAL COMPETENCIES:

<input checked="" type="checkbox"/> <b>Reading</b>	<input checked="" type="checkbox"/> <b>Speaking</b>	<input checked="" type="checkbox"/> <b>Critical Analysis</b>	<input checked="" type="checkbox"/> <b>Quantitative Skills</b>	<input checked="" type="checkbox"/> <b>Scientific Method of Inquiry</b>
<input checked="" type="checkbox"/> <b>Writing</b>	<input checked="" type="checkbox"/> <b>Listening</b>	<input checked="" type="checkbox"/> <b>Information Literacy</b>	<input checked="" type="checkbox"/> <b>Ethical Judgment</b>	<input checked="" type="checkbox"/> <b>Working Collaboratively</b>

KNOWLEDGE	Primary	Secondary	N/A	VALUE	Primary	Secondary	N/A
A. Global and Historical Knowledge & Understanding				Intellectual honesty	<input checked="" type="checkbox"/>		
• Comprehends a general knowledge of the nature, origins and contributions of major civilizations		<input checked="" type="checkbox"/>		Curiosity and openness to new ideas	<input checked="" type="checkbox"/>		
• Comprehends the workings and interrelations of personal, business and government economies		<input checked="" type="checkbox"/>		Recognition of one's own creative potential		<input checked="" type="checkbox"/>	
• Comprehends political, social and economic systems and their effects upon society		<input checked="" type="checkbox"/>		Acceptance of and respect for differences among people and cultures	<input checked="" type="checkbox"/>		
B. Cultural and Aesthetic Knowledge and Understanding							
• Comprehends the contributions of the arts and humanities to the human experience on a personal, national or global level			<input checked="" type="checkbox"/>	Civic Engagement		<input checked="" type="checkbox"/>	
• Comprehends the historical development of the arts and sciences		<input checked="" type="checkbox"/>		Lifelong Learning	<input checked="" type="checkbox"/>		
• Comprehends religious and cultural systems and their effects upon society		<input checked="" type="checkbox"/>					
C. Human Awareness and Understanding							
• Comprehends the dynamics of human behavior and the process of increasing self-awareness, growth and development		<input checked="" type="checkbox"/>					
• Comprehends the stages of human development and the dynamics of human relationships in diverse cultures		<input checked="" type="checkbox"/>					
• Comprehends the factors that promote physical, mental and social well-being	<input checked="" type="checkbox"/>						
D. Mathematics, Science and Technology							
• Comprehends the basic concepts and investigative processes of the natural sciences	<input checked="" type="checkbox"/>						
• Comprehends the breadth, significance and development of the mathematical sciences	<input checked="" type="checkbox"/>						
• Comprehends the ways science and technology have shaped and continue to reshape human cultures and the environment	<input checked="" type="checkbox"/>						

Name of Person Completing This Form: Nancy Webster Yurko

Signature: \_\_\_\_\_ Date: 3/4/05



Course Prefix and Number: <b>MCB 2010C</b>	Semester Credit Hours: <b>4</b>
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Course Title: <b>Microbiology</b>
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Discipline Area for the Course:		
<input type="checkbox"/> <b>Communication</b>	<input type="checkbox"/> <b>Mathematics</b>	<input type="checkbox"/> <b>Social &amp; Behavioral Sciences</b>
<input type="checkbox"/> <b>Humanities &amp; Visual/Performing Arts</b>	<input checked="" type="checkbox"/> <b>Natural Sciences</b>	<input type="checkbox"/> <b>Other-Designated Option</b>

INTELLECTUAL COMPETENCIES:					
<input checked="" type="checkbox"/> <b>Reading</b>	<input checked="" type="checkbox"/> <b>Speaking</b>	<input checked="" type="checkbox"/> <b>Critical Analysis</b>	<input checked="" type="checkbox"/> <b>Quantitative Skills</b>	<input checked="" type="checkbox"/> <b>Scientific Method of Inquiry</b>	
<input checked="" type="checkbox"/> <b>Writing</b>	<input checked="" type="checkbox"/> <b>Listening</b>	<input checked="" type="checkbox"/> <b>Information Literacy</b>	<input checked="" type="checkbox"/> <b>Ethical Judgment</b>	<input checked="" type="checkbox"/> <b>Working Collaboratively</b>	

	Learning Outcomes	Method Of Assessment
1	Explain and apply major concepts in microbiology including structure and metabolism of microbes, control methods, mechanism of the disease state, immunity, and representative organisms and diseases.	Written tests, reports and/or use of equipment to demonstrate student competency in field.
2	Demonstrate knowledge of scientific method.	Formulate problem, make observations, derive and test hypothesis and make conclusions.
3	Communicate scientific ideas through oral or written assignments.	Students use analytical reasoning skills to solve problems on written tests and/or laboratory work.
4	Interpret scientific models such as formulas, graphs, tables and schematics, draw inferences from them and recognize their limitations.	Written reports of lab experiments and/or written tests demonstrate student competency in the application of scientific knowledge.
5	Demonstrate problem solving methods in situations that are encountered outside of the classroom.	Students use demonstrations, group discussions, written tests, laboratory reports, research projects and/or field experiences to illustrate competence in recognizing and evaluating various scientific processes.
6	Demonstrate proper laboratory technique including safety in the use and care of laboratory equipment and materials.	Results from laboratory work and experiments demonstrate student awareness of science and society.

Name of Person Completing This Form: Nancy Webster Yurko

Signature: \_\_\_\_\_ Date: 3/4/05