



University of Jordan  
Faculty of Science  
Department of Biological Sciences  
Lecturer: Dr. Hussein Masoud

General Microbiology 0334341  
Time : 9:00-10:00 S, T, and T  
First Semester 2011-2012  
Office: Biology, Room 302

**Outline of the theory part**

<b><u>Lect. No</u></b>	<b><u>Chap. No</u></b>	<b><u>Lecture Topic</u></b>
1-3	1	<b>The Evolution of Microorganisms and Microbiology</b> 1.1. Members of the Microbial World 1.2. Microbial Evolution 1.3. Microbiology and Its Origins 1.4. Microbiology Today
4-9	3	<b>Bacteria and Archaea</b> 3.1. Prokaryotes 3.2. Common Features of Bacterial and Archaeal Cell Structure 3.3. Bacterial Cell Envelopes 3.4. Archaeal Cell Envelopes 3.5. Cytoplasm of Bacteria and Archaea 3.6. External Structures 3.7. Motility and Chemotaxis 3.8. Bacterial Endospores
10-12	6	<b>Microbial Nutrition</b> 6.1. Elements of Life 6.2. Carbon, Hydrogen, Oxygen, and Electrons 6.3. Nutritional Types of Microorganisms 6.4. Nitrogen, Phosphorus, and Sulfur 6.5. Growth Factors 6.6. Uptake of Nutrients 6.7. Culture Media
13-18	7	<b>Microbial Growth</b> 7.1. Reproductive Strategies 7.2. Bacterial Cell Cycle 7.3. Growth Curve 7.4. Measurement of Microbial Growth (in Lab) 7.5. Continuous Culture of Microorganisms 7.6. Influence of Environmental Factors on Growth

19-21	8	<b>Control of Microorganisms in the Environment</b> 8.1. Definitions of Frequently Used Terms 8.2. The Pattern of Microbial Death 8.3. Conditions Influencing the Effectiveness of Antimicrobial Agents 8.4. Physical Control Methods 8.5. Chemical Control Agents 8.6. Evaluation of Antimicrobial Agent Effectiveness 8.7. Biological Control of Microorganisms
22-23		<b>Midterm Exam ( 17 . 11. 2011 )</b>
24-28	10	<b>Catabolism: Energy Release and Conservation</b> 9.1. Chemoorganotrophic Fueling Processes 9.2. Aerobic Respiration 9.3. Glucolytic Pathways 9.4. Tricarboxylic Acid Cycle 9.5. Electron Transport and Oxidative Phosphorylation. 9.6. Anaerobic Respiration. 9.7. Fermentations 9.8. Catabolism of Other Carbohydrates 9.9. Lipid Catabolism. 9.10. Protein and Amino Acid Catabolism. 9.11. Chemolithotrophy 9.12. Phototrophy
29-32	12	<b>Genetics: Gene structure, replication, and expression</b> 11.1. DNA as Genetic Material. 11.2. Flow of Genetic Information 11.3. Nucleic Acid and Protein Structure. 11.4. DNA Replication. 11.5. Gene Structure. 11.6. Transcription 11.7. The Genetic Code 11.8. Translation 11.9. Protein Maturation and Secretion
33-37	14	<b>Microbial Genetics: Mechanisms of Genetic Variation</b> 14.1. Mutations: Their Chemical Basis and Effects 14.2. Detection and Isolation of Mmutants 14.3. DNA Repair 14.4. Creating Genetic Variability 14.5. Transposable Elements 14.6. Bacterial Plasmids 14.7. Bacterial Conjugation 14.8. Bacterial Transformation 14.9. Transduction
38-40	17	<b>Microbial Taxonomy and the Evolution of Diversity</b> 17.1. Introduction to Microbial Taxonomy 17.2. Taxonomic Ranks. 17.3. Techniques for Determining Microbial Taxonomy and Phylogeny 17.4. Phylogenetic Trees

17.5. Evolutionary Processes and the Concept of a Microbial Species

17.6. Bergey's Manual of Systematic Bacteriology

**41-42      19      Bacteria: The Deinococci and Nonproteobacteria Gram Negatives**  
19.3. Photosynthetic bacteria  
19.5. Phylum *Chlamydiae*  
19.6. Phylum *Spirochaetes*  
19.7. Phylum *Bacteroidetes*

**43-45      20      Bacteria: The Proteobacteria**  
20.1. Class *Alphaproteobacteria*  
20.2. Class *Betaproteobacteria*  
20.3. Class *Gammaproteobacteria*  
20.4. Class *Deltaproteobacteria*  
20.5. Class *Epsilonproteobacteria*

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### **Recommended References**

1. Prescott's Microbiology, 8<sup>th</sup> edition by J. M. Willey, L. M. Sherwood, and C. J. Woolverton. 2011. McGraw-Hill.
2. Brock, Biology of Microorganisms, 11<sup>th</sup> ed. By Madigan & Martinko. 2006. Pearson, Prentice Hall.

### **Grades:**

#### Theory Part:

Midterm Exam	17.11. 2011	30%
Final Exam		35%

#### Practical Part:

Midterm Exam.	24 .11. 2011	10%
Reports & Personal Evaluation		10%
Final Exam		15%

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