

SPRINGFIELD TECHNICAL COMMUNITY COLLEGE

**ACADEMIC AFFAIRS**

Course Number: BIOL 206 Department: Biological Sciences

Course Title: General Biology 2 Semester: Spring Year: 1997

**Objectives/Competencies**

<b>Course Objective</b>	<b>Competencies</b>
1. Protein Synthesis	<ol style="list-style-type: none"><li>1. Describe experiments linking genes to proteins</li><li>2. Explain importance of Beadle &amp; Tatum's results</li><li>3. Compare RNA and DNA</li><li>4. Describe transcription and translation</li><li>5. Explain genetic code</li><li>6. Compare different types of RNA</li><li>7. Review initiation, elongation, and termination</li></ol>
2. Microbial Genetics	<ol style="list-style-type: none"><li>1. Describe basic design of virus</li><li>2. Explain concept of obligate parasite</li><li>3. Compare lysogenic and lytic cycles</li><li>4. Contrast conjugation, transduction, and transformation</li><li>5. Describe the role of the F plasmid</li><li>6. Explain the lac and trp operans</li></ol>
3. DNA Technology	<ol style="list-style-type: none"><li>1. Describe major techniques of gene manipulation</li><li>2. Discuss use of restriction enzymes</li><li>3. Explain polymerase chain reaction</li></ol>

Course Objective	Competencies
4. Theory of Evolution	<ol style="list-style-type: none"><li>4. Outline applications of DNZ technology</li><li>5. Describe role of Agrobacterium</li> <li>1. Outline early theories</li><li>2. Describe major contributions of early biologists</li><li>3. Discuss Lamarck's view of evolution</li><li>4. Describe Darwin's voyage and observations</li><li>5. State how Wallace influenced Darwin</li><li>6. List evidences of evolution</li></ol>
5. Origin of Life	<ol style="list-style-type: none"><li>1. Describe early atmosphere on earth</li><li>2. Discuss Miller, Urey, and Oparin's models</li><li>3. Summarize stages of chemical evolution</li><li>4. Discuss Whittaker's system of classification</li></ol>
6. Prokaryote	<ol style="list-style-type: none"><li>1. Describe basic morphology of prokaryote</li><li>2. List major features of cell surfaces</li><li>3. Compare motility to that of eukaryotes</li><li>4. Compare genome to that of higher cells</li><li>5. Account for different staining properties</li><li>6. Describe significance of endospores</li></ol>
7. Protists	<ol style="list-style-type: none"><li>1. Describe major features of protists</li><li>2. Compare autogenous and endosymbiotic models</li><li>3. List and describe protozoa phyla</li><li>4. Describe major algae divisions</li><li>5. Describe relevance of all forms to man</li></ol>

Course Objective	Competencies
8. Land Plants	<ol style="list-style-type: none"><li>1. List basic feature of plants</li><li>2. Diagram plant reproductive cycles</li><li>3. Describe major categories of land plants</li><li>4. Illustrate phylogenetic progressions</li><li>5. Compare life cycles of all groups</li><li>6. Distinguish between homosporous and heterosporous</li><li>7. Distinguish between pollination and fertilization</li><li>8. Describe major floral structures</li></ol>
9. Fungi	<ol style="list-style-type: none"><li>1. Describe the basic characteristics of fungi</li><li>2. Discuss nutrient absorption</li><li>3. Differentiate between coenocytic and septate</li><li>4. Describe in detail major fungal divisions</li><li>5. Explain association with algae in lichens</li><li>6. Discuss ecological significance</li><li>7. Identify mycorrhizae</li></ol>
10. Invertebrates and Vertebrates	<ol style="list-style-type: none"><li>1. Identify major characteristics of animals</li><li>2. Describe in detail phylogenetic trends</li><li>3. List characteristics of each phylum</li><li>4. Describe progression of systems</li><li>5. Compare deuterostome and protostomes</li><li>6. Describe classes of vertebrates and progressions</li><li>7. List primary features of chordates</li></ol>
11. Plant Architecture and Growth	<ol style="list-style-type: none"><li>1. List differences between monocots and dicots</li><li>2. Describe different organs and their functions</li><li>3. Explain how taproots differ from fibrous</li></ol>

Course Objective	Competencies
12. Conduction within Plants	<ol style="list-style-type: none"> <li>4. List the types of tissues found in plants and roles</li> <li>5. Explain growth mechanisms</li> <li>6. Describe role of Casparian strip and endodermis</li> <li>7. Describe in detail structures of root, stems, and leaves</li> </ol> <ol style="list-style-type: none"> <li>1. Compare symplastic and apoplastic routes</li> <li>2. Trace water and mineral movement</li> <li>3. Explain root pressure and guttation</li> <li>4. Explain role of guard cells</li> <li>5. Outline mechanism for transpiration</li> <li>6. Describe process of translocation</li> <li>7. List major macronutrients</li> </ol>
13. Plant Control	<ol style="list-style-type: none"> <li>1. Explain the phenomenon of photoperiodism</li> <li>2. List the five classes of plant hormones and functions</li> <li>3. Account for acid-growth influence of auxins</li> <li>4. Compare roles of auxins and gibberellins</li> <li>5. Describe antagonistic and synergistic hormone roles</li> <li>6. List applications for agriculture</li> </ol>
14. Animal Systems	<ol style="list-style-type: none"> <li>1. Differentiate between herbivore, carnivore, omnivore</li> <li>2. Compare intracellular and extracellular digestion</li> <li>3. Compare invertebrate systems showing advances</li> <li>4. Describe human systems, their components and roles</li> <li>5. List the two mechanisms of hormonal action</li> <li>6. Describe physiology of major human systems</li> </ol>