# Biochemistry 384 – Foundations in Biochemistry

| Module | Topic-Rev | Lecture Title (PPT and Lecture Video) | Textbook Readings |
|---|---|---|---|
| **1** | MO1.T01 | *Introduction to Biochemical Principles* | *Chapter 1.1* |
| | MO1.T02 | *The Complexity of Life* | *Chapter 1.2* |
| | MO1.T04 | *Review of Thermodynamics* | *Chapter 2.1* |
| | MO1.T05-7 | *Principles of Bioenergetics* | *Chapter 2.1* |
| *D2Q-01R SW-01R* | MO1.T08 | *Water is Essential for Life* | *Chapter 2.2* |
| **2** | MO2.T01 | *Structure of DNA and RNA* | *Chapter 3.1* |
| | MO2.T03 | *RNA Biochemistry and Binding Proteins* | *Chapter 3.1* |
| | MO2.T06 | *Protein Polymers* | *Chapter 4.1* |
| | MO2.T07 | *Chemistry of Amino Acids* | *Chapter 4.1* |
| *D2Q-02R SW-02R* | MO2.T08 | *Chemistry of the Peptide Bonds* | *Chapter 4.1* |
| **3** | MO3.T01 | *Protein Structure: Primary and Secondary* | *Chapter 4.2* |
| | MO3.T02 | *Protein Structure: Tertiary and Quaternary* | *Chapter 4.2* |
| *D2Q-03 SW-03* | MO3.T03 | *Mechanisms of Protein Folding* | *Chapter 4.3* |
| | | ***EXAM 1 Topics covered in Modules 1-3*** | |
| **4** | MO4.T01 | *Protein Purification; Chromatography* | *Chapter 5.1* |
| | MO4.T02 | *Protein Purification; Electrophoresis* | *Chapter 5.1* |
| | MO4.T03 | *Protein Structure Methods* | *Chapter 5.2, 5.3* |
| | MO4.T04 | *Major Protein Classes* | *Chapter 6.1* |
| | MO4.T05 | *Hemoglobin: Structure and Function* | *Chapter 6.2* |
| *D2Q-04 SW-04* | MO4.T06 | *Oxygen Binding to Hemoglobin* | *Chapter 6.2* |
| **5** | MO5.T01 | *Hemoglobin: Allostery and Evolution* | *Chapter 6.2* |
| | MO5.T02 | *Membrane Transport Proteins* | *Chapter 6.3* |
| | MO5.T03 | *Passive Transport* | *Chapter 6.3* |
| | MO5.T04 | *Active Transport* | *Chapter 6.3* |
| *D2Q-05 SW-05* | MO5.T05 | *Muscle Contraction* | *Chapter 6.4* |

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|---|---|---|---|
| **6** | MO6.T01 | *Overview of Enzymes* | *Chapter 7.1* |
| | MO6.T02 | *Enzyme Function* | *Chapter 7.2* |
| | MO6.T03 | *Enzyme Mechanisms* | *Chapter 7.3* |
| | MO6.T04 | *Enzyme Reactions* | *Chapter 7.3* |
| *D2Q-06 SW-06* | MO6.T05 | *Enzyme Kinetics* | *Chapter 7.4* |
| | | ***EXAM 2 Topics covered in Modules 4-6*** | |
| **7** | MO7.T01 | *Enzyme Inhibition* | *Chapter 7.5* |
| | MO7.T02 | *Enzyme Regulation* | *Chapter 7.5* |
| | MO7.T03 | *Cell Signaling* | *Chapter 8.1* |
| *D2Q-07 SW-07* | MO7.T04 | *G Protein-Coupled Receptors* | *Chapter 8.2* |
| **8** | MO8.T01 | *Growth Factor Signaling* | *Chapter 8.3* |
| | MO8.T02 | *Insulin Signaling* | *Chapter 8.3* |
| | MO8.T03 | *Tumor Necrosis Factor Signaling* | *Chapter 8.4* |
| | MO8.T04 | *Nuclear Receptor Signaling* | *Chapter 8.5* |
| | MO8.T05 | *Overview of Metabolism* | *Chapter 9.1* |
| *D2Q-08 SW-08* | MO8.T06 | *Metabolic Flux* | *Chapter 9.1* |
| **9** | MO9.T01 | *Simple Sugars* | *Chapter 9.2* |
| | MO9.T02 | *Glycolysis Energetics* | *Chapter 9.3* |
| | MO9.T03 | *Glycolysis Reactions* | *Chapter 9.3* |
| | MO9.T04 | *Glycolysis Regulation* | *Chapter 9.4* |
| *D2Q-09 SW-09* | MO9.T05 | *Glycolysis Shared Intermediates* | *Chapter 9.5* |
| | | ***EXAM 3 Topics covered in Modules 7-9*** | |
| **10** | MO10.T01 | *REDOX Reactions* | *Chapter 10.1* |
| | MO10.T02 | *Pyruvate Dehydrogenase Overview* | *Chapter 10.2* |
| | MO10.T03 | *Pyruvate Dehydrogenase Reactions* | *Chapter 10.2* |
| *D2Q-10 SW-10* | MO10.T04 | *Citrate Cycle Reactions* | *Chapter 10.3* |

| Module | Topic-Rev | Lecture Title (PPT and Lecture Video) | Textbook Readings |
|---|---|---|---|
| **11** | MO11.T01 | *Citrate Cycle Regulation* | *Chapter 10.4, 10.5* |
| | MO11.T02 | *Chemiosmosis* | *Chapter 11.1* |
| | MO11.T03 | *Electron Transport System - Part 1* | *Chapter 11.2* |
| *D2Q-11 SW-11* | MO11.T04 | *Electron Transport System - Part 2* | *Chapter 11.2* |
| **12** | MO12.T01 | *ATP Synthase* | *Chapter 11.3* |
| | MO12.T02 | *Mitochondrial Transport* | *Chapter 11.4* |
| *D2Q-12 SW-12* | MO12.T03 | *Regulation of Oxidative Phosphorylation* | *Chapter 11.5* |
| | | ***EXAM 4 Topics covered in Modules 10-12*** | |
| | | ***FINAL EXAM: Based on a Set of 250 Questions***<br>*(Final Exam Question Set is available in the D2L Quiz tab)* | |