

# BIOCHEMISTRY WITH A MEDICAL PERSPECTIVE

Online Biochemistry Course, Faculty of Medicine, University of Toronto, Canada

## Course Schedule

Summer Semester 11 April to 23 July 2022

Week	Section / Online Quiz	Dates (Week Start)	Lectures	Lecturer	Medical Vignettes By Dr. Murray	Text Chapter
			<b>Course Introductory Lecture (Mandatory), E - presence Controls/My Media Videos</b>	Dr. Reithmeier	<b>*One medical vignette will be selected per weekly lecture series*</b>	
1	<b>Proteins and Enzymes</b>	11 Apr 2022	Lecture 1 - <b>Biochemistry and the Unity of Life</b> Lecture 2 - <b>Water, Weak bonds, pH</b> Lecture 3 - <b>Amino Acids</b> Lecture 4 - <b>Protein 3D Structure: Part 1</b>	Dr. Reithmeier Dr. Reithmeier Dr. Reithmeier Dr. Reithmeier	<b>Pathological Conditions Result if Protein Intake Is Inadequate</b>	1 2 3 4,5
2		18 Apr 2022	Lecture 5 - <b>Protein 3D Structure: Part 2</b> Lecture 6 - <b>Enzymes: Basic Concepts</b> Lecture 7 - <b>Enzyme Kinetics</b> Lecture 8 - <b>Enzyme Regulation, Allostery</b>	Dr. Reithmeier Dr. Baker Dr. Baker Dr. Baker	<b>Medical Uses of Enzymes: Diagnostic Enzymology</b>	4, 5 6 7 7
<b>Quiz 1 25 Apr 2022</b>						
3		25 Apr 2022	Lecture 9 - <b>Enzyme Inhibition</b> Lecture 10 - <b>Enzyme Mechanisms</b> Lecture 11 - <b>Hemoglobin</b> Lecture 12 - <b>Carbohydrates One</b>	Dr. Baker Dr. Baker Dr. Baker Dr. Baker	<b>CO- The Silent Killer</b>	8 8 9 10
4		02 May 2022	Lecture 13 - <b>Carbohydrates Two</b> Lecture 14 - <b>Lipids: Fatty Acids, Membrane Lipids</b> Lecture 15 - <b>Membrane Structure and Membrane Proteins</b> Lecture 16 - <b>Membrane Transport Proteins</b>	Dr. Baker Dr. Reithmeier Dr. Reithmeier Dr. Reithmeier	<b>Liposomes</b>	10 11 12 12
<b>Quiz 2 09 May 2022</b>						
5	<b>Metabolism</b>	09 May 2022	Lecture 17 - <b>Membrane Signaling Proteins</b> Lecture 18 - <b>Metabolism : Basic Concepts</b> Lecture 19 - <b>Glycolysis</b> Lecture 20 - <b>Accessing Glycogen Stores</b>	Dr. Reithmeier Dr. Baker Dr. Baker Dr. Baker	<b>Cholera and Whooping Cough Are Due to Altered G-protein Activity</b>	13 15 16 24

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6		16 May 2022	Lecture 21 – Pyruvate Dehydrogenase Complex and the Citric Acid Cycle Lecture 22 - Oxidative Phosphorylation/The Electron Transport Chain Lecture 23 - Oxidative Phosphorylation/Proton Motive Force Lecture 24 – Rebuilding Glycogen	Dr. Baker Dr. Baker Dr. Baker Dr. Baker	<b>Beriberi-A Disease Due to Deficiency Of Thiamine (Vitamin B-1)</b>	18,19 20 21  25
<b>Quiz 3      24 May 2022      **QUIZ MOVED TUESDAY MAY 24th</b>						
7		23 May 2022	Lecture 25 - Fat Mobilization Lecture 26 - Fatty Acid Degradation, ATP Production and Gluconeogenesis Lecture 27 - Diabetes and Ketone Bodies Lecture 28 - Discovery of Insulin	Dr. Baker Dr. Baker Dr. Baker Dr. Baker	<b>A Biochemical Understanding Of Glycogen Storage Diseases (GSDs) Is Possible</b>	27 17,27  27 13,27
8		30 May 2022	Lecture 29 - Fatty Acid and Triacylglycerol Synthesis Lecture 30 - Cholesterol Synthesis Lecture 31 - Lipoproteins Lecture 32 - Biochemistry of Platelets and Eicosanoids	Dr. Baker Dr. Baker Dr. Baker Dr. Baker	<b>Familial Hypercholesterolemia (FH)</b>	28,29  29 29 28
<b>Quiz 4      06 Jun 2022</b>						
9		06 Jun 2022	Lecture 33 - Phospholipid Synthesis Lecture 34 - Phosphoinositides and Signaling Lecture 35 - Amino Acid Synthesis Lecture 36 - Nucleotide Metabolism	Dr. Baker Dr. Baker Dr. Reithmeier Dr. Reithmeier	<b>Inherited Defects Of The Urea Cycle Cause Hyperammonemia</b>	29 13 31 32
10	<b>Nucleic Acids</b>	13 Jun 2022	Lecture 37 - Amino Acid Degradation and The Urea Cycle Lecture 38 - Nucleic Acid Structure One Lecture 39 - Nucleic Acid Structure Two Lecture 40 - DNA Replication	Dr. Reithmeier Dr. Kelley Dr. Kelley Dr. Kelley	<b>Loss of Allosteric Control Can Result in Pathological Conditions</b>	30 33 33 34

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<b>Quiz 5</b> <b>20 Jun 2022</b>						
11		20 Jun 2022	Lecture 41 - <b>DNA Repair</b> Lecture 42 - <b>Transcription I</b> Lecture 43 - <b>Transcription II</b> Lecture 44 - <b>Prokaryotic Regulation</b>	Dr. Kelley Dr. Kelley Dr. Kelley Dr. Kelley	<b>Some Genetic Diseases Are Caused by The Expansion of Repeats of Three Nucleotides</b>	35 36 36 37
12		27 Jun 2022	Lecture 45 - <b>Eukaryotic Regulation</b> Lecture 46 - <b>RNA Processing</b> Lecture 47 - <b>Genetic Code</b> Lecture 48 - <b>tRNAs and Amino Acids</b>	Dr. Kelley Dr. Kelley Dr. Kelley Dr. Kelley	<b>Genetic Defects Causing Cystic Fibrosis</b>	37 38 39 39
<b>Quiz 6</b> <b>05 Jul 2022</b> <b>**QUIZ MOVED TUESDAY JULY 5th</b>						
13		04 Jul 2022	Lecture 49 - <b>Translation I</b> Lecture 50 - <b>Translation II</b> Lecture 51 - <b>Protein Secretion</b> Lecture 52 - <b>Translation Regulation</b>	Dr. Kelley Dr. Kelley Dr. Kelley Dr. Kelley	<b>Some Antibiotics and Some Toxins Act by Inhibiting Protein Synthesis</b>	40 40 40 40
14		11 Jul 2022	Lecture 53 - <b>Recombinant Technology I</b> Lecture 54 - <b>Recombinant Technology II</b>	Dr. Kelley Dr. Kelley	<b>Gene Therapy, Transgenic Animals</b>	5, 41 5, 41
<b>MOCK QUIZ</b> <b>Available</b> <b>11 Jul 2022</b>						

## Final Examination 2022

### Date

23 July 2022

### Duration of Exam

3 hours

### Material Tested

Final exam includes all topics covered throughout the course