

## CURRICULUM GUIDE: OFFICIAL COURSE OUTLINE

Course Code	BIOL 201	Course Title	Cell Biology			
Credit Value	4	Department	Mathematics and Science			
No. of weeks	14	Hrs. per week	<i>Lecture</i>	<i>Tutorial</i>	<i>Laboratory</i>	<i>Total</i>
			3	0	3	6
Course Description	This course investigates the structure and function of plant and animal cells; membrane models, cytoplasmic organelles, biological information from gene to protein, the endomembrane system, secretion, intracellular digestion, endocytosis, transport processes, cytoskeleton and cell motility. Modern techniques used in the analysis of organelle and cell function are integral parts of the course					
Prerequisite(s)	ENGL 100, BIOL 101 & BIOL 102 (or BIOL 101 B or higher), CHEM 102					
Initial Articulation Targets	<i>UBC</i>	<i>SFU</i>	<i>UVic</i>	<i>UNBC</i>	<i>TRU</i>	
	BIOL_V 200 (3)	MBB 201 (3)	BIOL 225 (1.5)	BIOL 2XX (3)	BIOL 2130 (3)	
	For updated information on the transferability of this course, please consult the BC Transfer Guide, <a href="http://www.bctransferguide.ca">www.bctransferguide.ca</a>					
Learning Outcomes	<p>Upon successful completion of this course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• Compare the structure and function of the four main classes of biological macromolecules.</li> <li>• Analyze the basic metabolism of eukaryotic cells including central metabolic pathways involved with cellular respiration and photosynthesis.</li> <li>• Apply the energetics of cellular reactions to calculate free energy changes for important biological reactions.</li> <li>• Utilize the basic structure and function of cellular membranes to assess the modes of cellular communication and movement of molecules.</li> <li>• Use the transport processes which occur in cells to describe the role of the endomembrane system.</li> <li>• Differentiate between the different stages and the control of the cell cycle.</li> <li>• Explain the structure and functions of the cytoskeleton.</li> <li>• Analyze and interpret scientific experimental data and be able to make summary graphs and tables.</li> <li>• Demonstrate laboratory skills such as: use of spectrophotometers, protein gel electrophoresis, use of analytical probes and DNA analysis.</li> </ul>					



Content	<p><b>Core topics</b> – all of the following will be covered:</p> <ul style="list-style-type: none"> <li>• Plant and animal cell structure and function</li> <li>• Review of protein biochemistry and macromolecules</li> <li>• Structure and function of membranes and organelles</li> <li>• Biological information flow (transcription and translation)</li> <li>• Cell cycle</li> <li>• Energy conversion and carbon flow (photosynthesis and cellular respiration)</li> <li>• Intracellular compartments and protein sorting</li> <li>• Intracellular vesicular traffic</li> <li>• Cell signaling</li> <li>• The cytoskeleton and cell based movement</li> <li>• Modern techniques using the analysis of organelle and cell function</li> </ul> <p>Additional topics may also be covered, at the discretion of the instructor.</p> <p>Labs:</p> <ul style="list-style-type: none"> <li>• Oil Microscopy</li> <li>• Restriction Enzymes Analysis</li> <li>• Agarose Gel</li> <li>• Cellular Respiration</li> <li>• Bacterial Transformation</li> <li>• DNA Fingerprinting and Electrophoresis</li> <li>• Sodium Dodecyl Sulfate-Polyacrylamide Gel Electrophoresis (SDS-PAGE)</li> <li>• Western Blot</li> </ul>	
Methods of Instruction	Lectures, demonstrations, small group discussions, case study analysis, concept mapping, and internet research.	
Required Textbook(s)	<p>The following textbook(s) is/are required, or approved equivalent(s).</p> <p>Alberts, Bruce et al. Essential Cell Biology. The last edition. W W Norton &amp; Co Inc.</p> <p>Hart, Peter E and Hable Whitney. Biology of Cells Laboratory Manual. 2nd Edition. Hunt Publishing Company, 2014.</p>	
Required Equipment and Technology	<p>Students are required to have a computer with internet access.</p> <p>The following resources are provided by the College:</p> <ul style="list-style-type: none"> <li>• Office 365</li> <li>• Student email</li> </ul>	
Homework Hours	At minimum, students can expect one hour of homework for every hour of instructional time.	
Evaluation	<i>Component</i>	<i>% Value</i>
	Quizzes and assignments	10-15%
	Laboratory experiments and activities	15-20%
	<ul style="list-style-type: none"> <li>• Weight divided over 8 labs</li> </ul>	
	Comprehensive laboratory exam	15-20%



	Midterm exam Comprehensive final exam	15-20% 30-35%	
Completion Requirements	The minimum grade to pass this course is D (50%). Unless otherwise stated, a minimum grade of C- (55%) is required for this course to fulfil a prerequisite.		
Course Designer(s)	Dr. Mitra Panahi, Biology Instructor, Alexander College	Consultant(s), <i>if applicable</i>	Sharon Gillies, Ph.D., (Head) Department of Biology, University of the Fraser Valley
Dean's Approval	Barbara Moon, Ph.D. Dean of Arts and Sciences, Alexander College	Dean's Approval Date	October 5, 2014
Curriculum Committee Approval Date	October 5, 2014	First Term Offered	Spring 2018
Last Review Date	September 1, 2024	Next Review Date	September 1, 2029
Revision History	June 28, 2016-Prerequisites changed to ENGL 099, BIOL 101 and 102 or BIOL 101 (B or higher), CHEM 102 per Barbara Moon and Mitra Panahi.  March 1, 2023-Minor updates (e.g., assessment ranges, textbooks) by Lindsey Spielman and Carol Pollock  September 1, 2024 – Laboratory assessments revised by Kelly Cheung.  January 2, 2025 – English prerequisite increased to ENGL 100, effective Winter 2025		