Sir John A. Macdonald Collegiate Institute Course Brief

Course Name	Grade 12 University Biology	**Grade**	12
Course Code	SBI4U1	**Credit Value**	1.0
Pre-Requisite	SBI3U1/3 **Or Recommended Pre-Requisite**		
Type of Course	University		

TEXTBOOK: Biology 12 (McGraw-Hill Ryerson) REPLACEMENT COST (if lost or damaged): $ 124.95

Course Description

This course provides students with the opportunity for in-depth study of the concepts and processes that occur in biological systems. Students will study theory and conduct investigations in the areas of biochemistry, metabolic processes, molecular genetics, homeostasis, and population dynamics. Emphasis will be placed on the achievement of detailed knowledge and the refinement of skills needed for further study in various branches of the life sciences and related fields.

Curriculum Strands

Biochemistry

- analyse technological applications of enzymes in some industrial processes, and evaluate technological advances in the field of cellular biology;
- investigate the chemical structures, functions, and chemical properties of biological molecules involved in some common cellular processes and biochemical reactions;
- demonstrate an understanding of the structures and functions of biological molecules, and the biochemical reactions required to maintain normal cellular function.

Metabolic Processes

- analyse the role of metabolic processes in the functioning of biotic and abiotic systems, and evaluate the importance of an understanding of these processes and related technologies to personal choices made in everyday life;
- investigate the products of metabolic processes such as cellular respiration and photosynthesis;
- demonstrate an understanding of the chemical changes and energy conversions that occur in metabolic processes.

Molecular Genetics

- analyse some of the social, ethical, and legal issues associated with genetic research and biotechnology;
- investigate, through laboratory activities, the structures of cell components and their roles in processes that occur within the cell;
- demonstrate an understanding of concepts related to molecular genetics, and how genetic modification is applied in industry and agriculture.

Homeostasis

- evaluate the impact on the human body of selected chemical substances and of environmental factors related to human activity;
- investigate the feedback mechanisms that maintain homeostasis in living organisms;
- demonstrate an understanding of the anatomy and physiology of human body systems, and explain the mechanisms that enable the body to maintain homeostasis.

Population Dynamics

- analyse the relationships between population growth, personal consumption, technological development, and our ecological footprint, and assess the effectiveness of some Canadian initiatives intended to assist expanding populations;
- investigate the characteristics of population growth, and use models to calculate the growth of populations within an ecosystem;
- demonstrate an understanding of concepts related to population growth, and explain the factors that affect the growth of various populations of species.

Assessment and Evaluation of Student Achievement

Unit	Unit Title	Evaluation Task	Achievement Chart Focus
Unit 1	Biochemistry	Biochemistry Quiz Membrane Transport Lab Macromolecules Lab Enzyme Lab Teacher's Choice Unit Test	K C, T and A C, T and A C, T and A T and/or C and/or A K and A
Unit 2	Metabolic Processes	Cellular Respiration and/or Photosynthesis Quiz Cellular Respiration Lab Photosynthesis Lab Teacher's Choice Unit Test	K T and/or C and/or A C, T and A T and/or C and/or A K and A
Unit 3	Molecular Genetics	Genetics Quiz DNA History Assignment DNA Extraction Lab Protein Synthesis Activity Teacher's Choice Unit Test	K C and A T and/or C and/or A T and/or C and/or A T and/or C and/or A K and A

Unit 4	Homeostasis	Homeostasis Lab(s) Teacher's Choice Nervous System Quiz Endocrine and Excretory System Test	T , C and A T and/or C and/or A K, A and/or T K, A and/or T
Unit 5	Population Dynamics	Population Dynamics Assignment Population Lab	K and C T, C and A

****Assessments and Evaluations are subject to change****

Levels of Achievement

For Grades 9 to 12, a student's achievement of the overall curriculum expectations will be evaluated in accordance with the achievement charts in the provincial curriculum and will be reported using percentage marks.

Achievement Level	Percentage Mark Range	Achievement Description
HL4/L4+ L4 LL4/L4-	95 – 100 87 – 94 80 – 86	Level 4 identifies achievement that surpasses the provincial standard. The student demonstrates the specified knowledge and skills with a high degree of effectiveness.
HL3/L3+ L3 LL3/L3-	77 – 79 73 – 76 70 – 72	Level 3 represents the provincial standard for achievement. The student demonstrates the specified knowledge and skills with considerable effectiveness. Parents of students achieving at level 3 can be confident that their children will be prepared for work in subsequent grades/courses
HL2/L2+ L2 LL2/L2-	67 – 69 63 – 66 60 – 62	Level 2 represents achievement that approaches the provincial standard. The student demonstrates the specified knowledge and skills with some effectiveness. Students performing at this level need to work on identified learning gaps to ensure future success.
HL1/L1+ L1 LL1/L1-	57 – 59 53 – 56 50 – 52	Level 1 represents achievement that falls much below the provincial standard. The student demonstrates the specified knowledge and skills with limited effectiveness. Students must work at significantly improving learning in specific areas, as necessary, if they are to be successful in the next grade/course

Students who achieve below 50% have not met curriculum expectations; a credit will not be granted.

Learning Skills	**Assessment of Learning Skills**
Responsibility Organization Independent Work Collaboration Initiative Self-Regulation	Excellent (E) Good (G) Satisfactory (S) Needs Improvement (N)

Weighting by Categories			
Knowledge and Understanding	34%	Communication	22%
Thinking	22%	Application	22%

Assessment and Evaluation Strategies: the following is a list of potential A/E strategies used within the course; the list may not be exhaustive and is subject to change

- Paper & pencil quizzes & tests
- Formal examination
- Practical lab performance
- Written assignment/projects
- Research presentations
- Library/Internet research projects
- Formal lab reports
- Scientific illustration
- Graphical analysis & presentation
- Portfolio assessment

CALCULATION OF FINAL MARK

FINAL MARK
→ 70% for evaluations conducted throughout the course → 30% culminating activities