Applied Computing – Bioinformatics Program Description

Note: This program description is temporary until the official University of Saskatchewan Course and Program Catalogue is published for the 2022-2023 academic year (Winter 2022). ***Program requirements are subject to change up to that point.***

	Bachelor of Science Four-year (B.Sc. Four-year) – Applied Computing – Bioinformatics No more than 6 credit units from one subject may be used in Requirements C1, C2, and the Junior Course Requirements in C3.	**Bachelor of Science Honours (B.Sc. Honours) – Bioinformatics** Students interested in entering an Honours program should consult advisors in the department concerned before registering for their second year. Of the 120 credit units required for the B.Sc. Honours degree, at least 66 credit units must be at the senior level. Application for admission to Honours is not considered until successful completion of at least 60 credit units with a Cumulative Weighted Average of at least 70% overall and at least 70% in the subject of Honours. For further details, please see the Academic Information and Policies section. No more than 6 credit units from one subject may be used in Requirements C1, C2, and the Junior Course Requirements in C3.
C1 College Require-ment (15 credit units)	**English Language Writing** Choose **6 credit units** from the following: • *Full list*	**Indigenous Learning** Choose **3 credit units** from the following: • *Full list* **Quantitative Reasoning** • MATH 163.3 Introduction to Mathematical Reasoning • MATH 164.3 Introduction to Linear Algebra
C2 Breadth Require-ment (6 credit units)	Choose **6 credit units** from the following areas: Fine Arts Humanities Social Sciences Courses with No Program Type	
C3 Cognate Require-ment (6 credit units)	**(6 credit units)** • CHEM 112.3 • PHIL 232.3 Ethics and Professional Responsibility in Computer Science	
C4	**(78 credit units)**	**(81 credit units)**

Major Require-ment	• BINF 351.3 Introduction to Bioinformatics • BINF 451.3 Algorithms and Modeling in Bioinformatics • BIOL 120.3 The Nature of Life • BIOL 121.3 The Diversity of Life • BMSC 200.3 Biomolecules • CHEM 250.3 Introduction to Organic Chemistry • CMPT 141.3 Introduction to Computer Science • CMPT 145.3 Principles of Computer Science • CMPT 260.3 Mathematical Logic and Computing • CMPT 270.3 Developing Object Oriented Systems • CMPT 280.3 Intermediate Data Structures and Algorithms • CMPT 318.3 Data Analytics • CMPT 353.3 Full Stack Web Programming • CMPT 360.3 Introduction to Artificial Intelligence Choose **3 credit units** from the following: • BMSC 240.3 Laboratory Techniques • BIOL 226.3 Genes to Genomics Choose **3 credit units** from the following: • BMIS 340.3 Introductory Molecular Biology • BIOL 316.3 Molecular Genetics of Eukaryotes Choose **3 credit units** from the following: • STAT 245.3 Introduction to Statistical Methods • STAT 246.3 Introduction to Biostatistics Choose **6 credit units** from the following, from any of the areas listed: Simulation: • CMPT 214.3 Programming Principles and Practice • CMPT 394.3 Simulation Principles	• BINF 351.3 Introduction to Bioinformatics • BINF 451.3 Algorithms and Modeling in Bioinformatics • BIOL 120.3 The Nature of Life • BIOL 121.3 The Diversity of Life • BMSC 200.3 Biomolecules • CHEM 250.3 Introduction to Organic Chemistry • CMPT 141.3 Introduction to Computer Science • CMPT 145.3 Principles of Computer Science • CMPT 260.3 Mathematical Logic and Computing • CMPT 270.3 Developing Object Oriented Systems • CMPT 280.3 Intermediate Data Structures and Algorithms • CMPT 318.3 Data Analytics • CMPT 353.3 Full Stack Web Programming • CMPT 360.3 Introduction to Artificial Intelligence • CMPT 407.3 Research Topics in Applied Computing Choose **3 credit units** from the following: • BMSC 240.3 Laboratory Techniques • BIOL 226.3 Genes to Genomics Choose **3 credit units** from the following: • BMIS 340.3 Introductory Molecular Biology • BIOL 316.3 Molecular Genetics of Eukaryotes Choose **3 credit units** from the following: • STAT 245.3 Introduction to Statistical Methods • STAT 246.3 Introduction to Biostatistics Choose one of the following areas (**6 credit units**): Simulation: • CMPT 214.3 Programming Principles and Practice • CMPT 394.3 Simulation Principles

	Artificial Intelligence: • CMPT 317.3 Introduction to Artificial Intelligence • CMPT 423.3 Machine Learning Theory: • CMPT 364.3 Automata and Formal Languages • CMPT 463.3 Advanced Algorithms Visualization: • CMPT 384.3 Information Visualization • CMPT 484.3 Graph Drawing and Network Visualization Choose **21 credit units** from the following: • ACB 331.3 Methods in Cell and Developmental Biology • ANBI 470.3 Applied Animal Biotechnology • ANSC 313.3 Animal Breeding and Genetics • BIOC 405.3 Structure and Function of Biomolecules • BIOC 436.3 Advanced Molecular Biology • BIOL 222.3 The Living Plant • BIOL 325.3 Plant Cells and Tissues • BIOL 420.3 Molecular Biology of Plants • BIOL 421.3 Functional Genomics • BMSC 210.3 Microbiology • BMSC 220.3 Cell Biology • BMSC 230.3 Metabolism • BMSC 320.3 Nucleic Acids from Central Dogma to Human Disease • CHEM 255.3 Bio Organic Chemistry • MCIM 417.3 Molecular Virology • MCIM 487.3 Microbial Genetic Systems • PLSC 317.3 Plant Metabolism • PLSC 411.3 Plant Breeding • PLSC 416.3 Applied Plant Biotechnology	Artificial Intelligence: • CMPT 317.3 Introduction to Artificial Intelligence • CMPT 423.3 Machine Learning Theory: • CMPT 364.3 Automata and Formal Languages • CMPT 463.3 Advanced Algorithms Visualization: • CMPT 384.3 Information Visualization • CMPT 484.3 Graph Drawing and Network Visualization Choose **21 credit units** from the following, with at least 3 credit units at the 400-level: • ACB 331.3 Methods in Cell and Developmental Biology • ANBI 470.3 Applied Animal Biotechnology • ANSC 313.3 Animal Breeding and Genetics • BIOC 405.3 Structure and Function of Biomolecules • BIOC 436.3 Advanced Molecular Biology • BIOL 222.3 The Living Plant • BIOL 325.3 Plant Cells and Tissues • BIOL 420.3 Molecular Biology of Plants • BIOL 421.3 Functional Genomics • BMSC 210.3 Microbiology • BMSC 220.3 Cell Biology • BMSC 230.3 Metabolism • BMSC 320.3 Nucleic Acids from Central Dogma to Human Disease • CHEM 255.3 Bio Organic Chemistry • MCIM 417.3 Molecular Virology • MCIM 487.3 Microbial Genetic Systems • PLSC 317.3 Plant Metabolism • PLSC 411.3 Plant Breeding • PLSC 416.3 Applied Plant Biotechnology
C5 Electives Require-	**(15 credit units)**	**(12 credit units)**

ment	Arts and Science courses, or those from other Colleges that have been approved for Arts and Science credit, to complete the requirements for 120 credit unit Four-year program, of which at least 66 must be at the 200-level or higher.	Arts and Science courses, or those from other Colleges that have been approved for Arts and Science credit, to complete the requirements for 120 credit unit Honours program, of which at least 66 must be at the 200-level or higher.