 College of Arts and Sciences

**BACHELOR OF SCIENCE DEGREE in BIOINFORMATICS**

Coursework is required in Biology, Bioinformatics, Computer Science, Chemistry, and Mathematics as outlined below. Bioinformatics is an interdisciplinary major and therefore fulfills College requirements. All University general education requirements must be met (summarized below) for a minimum of 120 credits to graduate.

**REQUIRED BIOLOGY COURSEWORK:**

BIOL 1450 Biology I 5 credits

BIOL 1750 Biology II 5 credits

BIOL 2140 Genetics 4 credits

BIOL 3020 Molecular Biology of the Cell 3 credits

BIOL 4130 or 4140 Molecular Genetics or Cellular Biology 4 credits

BIOL 4560 Bioinformatics Internship 3 credits

**REQUIRED BIOINFORMATICS COURSEWORK:**

BIOI 1000 Introduction to Bioinformatics 3 credits

BIOI 2000 | SP Foundations of Bioinformatics 3 credits

BIOI 3000 | FA Applied Bioinformatics 3 credits

BIOI 3500 | SP Advanced Bioinformatics Programming 3 credits

BIOI 4860 | FA Bioinformatics Algorithms 3 credits

BIOI 4870 | SP Database Search and Pattern Discovery 3 credits

**REQUIRED COMPUTER SCIENCE COURSEWORK:**

CIST 1400\* Introduction to Computer Science I 3 credits

CSCI 1620 Introduction to Computer Science II 3 credits

CIST 2500 Applied Statistics for IS&T 3 credits

CIST 3110 Information Technology Ethics (HFA) 3 credits

CSCI 3320 Data Structures 3 credits

\*Prerequisite: CIST 1300 or CSCI 1200

**REQUIRED CHEMISTRY COURSEWORK:**

CHEM 1140 & 1144 Fundamentals of College Chemistry 5 credits

 —OR—

CHEM 1180 & 1184 General Chemistry I 4 credits

CHEM 1190 & 1194 General Chemistry II 4 credits

CHEM 2210 & 2214 Fundamentals of Organic Chemistry 5 credits

—OR—

CHEM 2250 Organic Chemistry I 3 credits

CHEM 2260 & 2274 Organic Chemistry II 5 credits

CHEM 3650 & 3654 Fundamentals of Biochemistry 4 credits

 —OR—

CHEM 4610 Biochemistry of Metabolism 4 credits

or CHEM 4650/4654 & Biochemistry I 4 credits

 CHEM 4660/4664 Biochemistry II 4 credits

**REQUIRED MATHEMATICS COURSEWORK:**

MATH 1950 Calculus I 5 credits

MATH 2030 Discrete Mathematics 3 credits

WRITING IN THE DISCIPLINE (ADVANCED WRITING):

**Option I**

Advanced Writing requirement can be met by completing **two courses from** **each of the three tiers** below:

Tier I: BIOL 1450 (Biology I), BIOL 1750 (Biology II)

Tier II: BIOL 2140 (Genetics), BIOL 3020 (Molecular Biology of the Cell)

Tier III: BIOL 4130 or 4140 (Molecular Genetics or Cellular Biology), BIOL 4560 (Internship)

All courses used to meet the writing requirement **must be taken at UNO**. Only courses completed in 2010 or later qualify. Completion of the writing requirement will not exempt students from completing assigned writing in other courses.

**Option II**

Alternatively, students may meet the writing requirement by completing ENGL 3980 or ENGL 2400.

**GENERAL EDUCATION REQUIREMENTS (those not met by major coursework):**

ENGL 1150 or proficiency English Composition I 3 credits

ENGL 1160 or proficiency English Composition II 3 credits

CMST 1110 or 2120 Public Speaking or Argumentation and Debate 3 credits

Humanities/Fine Arts two different disciplines 6 credits

Social Sciences two different disciplines 9 credits

United States Diversity can be HFA or SS course

Global Diversity can be HFA or SS course

**RECOMMENDED ELECTIVE COURSES TO REACH 120 TOTAL CREDITS:**

BIOI 4890 | SP Computerized Genetic Sequence Analysis 3 credits

CSCI 4150 Graph Theory & Applications 3 credits

CSCI 4830 Introduction to Software Engineering 3 credits

CSCI 4850 Database Management Systems 3 credits

CSCI 4890 Data Warehousing and Data Mining 3 credits

BIOL 4760 Genome Technology and Analysis 3 credits

BIOL 4860 Comparative Genomics 3 credits

ISQA 4150 Advanced Statistical Methods for IS&T 3 credits

Note: Most courses are offered each semester, fall (FA) and spring (SP). Certain classes may also be offered during the summer (SU), and some electives may be offered less frequently. Consult your advisor for details.