Computer Science, Bioinformatics Concentration, B.A.

The Concentration in Bioinformatics presents up-to-date methods for data handling and interpretation while developing an understanding of critical issues in bioinformatics research design, statistical data analysis, and the application of genomics domain knowledge.

The B.A. in Computer Science with Concentration in Bioinformatics requires a compact set of a computer science core (15 credit hours). The Bioinformatics concentration requires 14 credit hours of related work with courses in the fields

of biology and chemistry, while other B.A. in Computer Science concentrations require 15 credit hours of elective courses outside the computer science discipline, satisfied by a second major, or a minor. Graduates of the B.A. program are expected to have knowledge and skill in computer science, plus elective coursework outside the discipline. The emphasis in this program is less theoretical/mathematical, and more on the applied side of computing.

All program-level Admissions and Progression Requirements are in addition to the University of North Carolina at Charlotte Admission Requirements.

Admission Requirements

Freshmen

- See University Admission Requirements
- *Minimum GPA*: 2.5
- Admission is competitive for computer science programs and, if admissible, freshmen must present a minimum SAT-Math score of 530 or ACT-Math subscore of 22.

Transfers

- See University Admission Requirements
- *Minimum GPA*: 2.5
- *Pre-Major/Prerequisite Courses*: A grade of C or above is required in any previously attempted Computer Science course(s). Students must be able to transfer credits for the equivalent of College Algebra.
- *Transferable Credit Hours*: 24

Currently Enrolled Students

- *Minimum GPA*: 2.5
- Must have earned 12 or more hours at UNC Charlotte

- Must have earned a grade of C or higher in MATH 1241, or MATH 1120 (Note: Students coming in with MATH 1120 will still be required to take MATH 1241 for the Bachelor of Science program)
- Must have earned a grade of C or higher in ITSC 1212, or ITSC 1110, or DTSC 1302
- Participation in a Change of Major Workshop offered by the CCI Advising Center is required before becoming eligible to declare the Computer Science major. Details are on the CCI Advising website.

Degree Requirements

General Education Courses (31-32 credit hours)

For details on required courses, refer to the General Education Program. Total hours to satisfy General Education Requirements may vary as some general education requirements may be double-counted in the major with departmental approval. Please see your advisor for information. Students majoring in Computer Science should plan on taking the following courses that meet both general education and major requirements:

- MATH 1120 - Calculus (3) *(fulfills Quantitative/Data requirement)*
- STAT 1222 - Introduction to Statistics (3) *(fulfills Quantitative/Data requirement)*

Major Courses (39 credit hours)

Core Courses (19 credit hours)

- ITSC 1212 - Introduction to Computer Science I (4)
- ITSC 1213 - Introduction to Computer Science II (4)

- ITSC 1600 - Computing Professionals (2)
- or ITSC 2600 - Computer Science Program, Identity, Career (2)
- ITSC 2175 - Logic and Algorithms (3)
- or MATH 2165 - Introduction to Discrete Structures (3)
- ITSC 2214 - Data Structures and Algorithms (4)
- ITSC 3688 - Computers and Their Impact on Society (3)

Advanced Statistics Course (3 credit hours)

- BINF 3121 - Statistics for Bioinformatics (3)

Related Courses (14 credit hours)

- BIOL 2120 - General Biology I (3)
- BIOL 2130 - General Biology II (3)
- CHEM 1251 - General Chemistry I (3)
- CHEM 1251L - General Chemistry I Laboratory (1)
- CHEM 1252 - General Chemistry II (3)
- CHEM 1252L - General Chemistry II Laboratory (1)

Capstone Course (3 credit hours)

Select one of the following:

- BINF 4650 - Senior Project (1 to 3)
- BINF 4900 - Principles of Team Science (3)
- ITCS 4232 - Game Design and Development Studio (3)
- ITIS 4390 - Interaction Design Projects (3)
- ITIS 4246 - Competitive Cyber Defense (3)
- ITSC 4681 - Senior Design I (3)
- ITSC 4682 - Senior Design II (3)
- ITSC 4850 - Senior Project I (3)
- ITSC 4851 - Senior Project II (3)

- ITSC 4990 - Undergraduate Research (3)
- ITSC 4991 - Undergraduate Thesis (3)
- ITSC 4750 - Honors Thesis (3)

Concentration Courses (27-29 credit hours)

Required Concentration Courses (18 credit hours)

- BINF 1101 - Introduction to Bioinformatics and Genomics (4) *(fulfills Natural Science General Education requirement)*
- BINF 2111 - Introduction to Bioinformatics Computing (4)
- BINF 3101 - Sequence Analysis (3)
- BINF 4600 - Bioinformatics and Genomics Seminar (1)
- BIOL 3111 - Cell Biology (3)
- BIOL 3166 - Genetics (3)

Concentration Elective Courses (9-11 credit hours)

Subarea 1: Database/Analytics (3-4 credit hours)

Select one of the following:

- BINF 4211 - Applied Data Mining for Bioinformatics (4)

Subarea 2: Professional Development (3 credit hours)

Select one of the following:

- BINF 4171 - Business of Biotechnology (3)
- BINF 4191 - Life Sciences and the Law (3)

Subarea 3: Upper-Division Elective (3-4 credit hours)

Select one of the following:

- BINF 3131 - Bioinformatics Algorithms (4)

- BINF 3201 - Genomic Methods (4)

Unrestricted Elective Courses

As needed to complete the credit hours required for graduation.

Degree Total = 120 Credit Hours

Progression Requirements

The GPA requirement for all Computer Science undergraduate degree programs is 2.0 or above in all courses applied to the degree and all courses in the major.

Students have a limit of 3 attempts per course in the major. This applies to all courses listed under the Major Courses and Concentration Courses categories of B.S. and B.A. in Computer Science degree programs. The third attempt at a course can only be approved by petition. In addition, a Withdrawal does not count as an attempt, as that effort is already restricted via the Withdrawal limit.

Students are required to achieve a grade of C or above in all Core Courses within the major, as listed above.

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