COMPUTER SCIENCE MAJOR, CONCENTRATION IN BIG DATA ANALYTICS

Data is being generated at high speed, in large volumes, and by a variety of systems around the world. In such a data-driven and information-centric world, the ability to analyze information and make informed decisions is crucial to every field including business, medicine, the sciences, entertainment, and government. This concentration provides students with the skills, techniques, and knowledge needed to pursue a career in this field.

Program Outcomes for the Major in Computer Science, Concentration in Big Data Analytics

Graduates of the Big Data Analytics Concentration will be able to (in addition to the Computer Science Major Program Learning Outcomes):

- Apply basic models, methods, programming languages, and tools for data storage, management and processing.
- Apply current data visualization techniques, programming languages and tools.
- Apply basic statistical data analysis methods, programming languages and tools.
- Apply cloud and distributed computing techniques, tools and services to solve real-word Big Data problems.
- Evaluate, select and apply data mining models, methods and tools for real-word problems.
- Evaluate, select and apply tools and technologies to analyze and solve Big Data problems.

A laptop computer running Windows, macOS, or Linux is required for courses in the Computer Science program. 16GB of memory is suggested. A Chromebook will not work.

Requirements for the Concentration in Big Data Analytics

Code	Title	Credits
Core Courses		**(38 credits)**
CS-101	Basics of Computer Science	3
CS-140	Introduction to Programming	4
CS-155	Computer Networking and Security	3
CS-225	Discrete Structures I	3
CS-242	Data Structures	3
CS-248	Algorithm Analysis	3
CS-254	Computer Organization and Architecture	4
CS-282	Unix Systems Programming	3
CS-286	Database Design and Applications	3
CS-295	Discrete Structures II	3
CS-348	Software Process Management	3
CS-373	Operating Systems	3
Elective Courses		**(3 credits)**
Credits in Computer Science courses at the 300 level or above [1]		3
Ancillary Requirements [2]		**(31 credits)**
CM-110	Public Speaking	3
EN-252	Technical Writing	3
UR-230	Technology, Public Policy and Urban Society	3
or PH-134	Computing Ethics	
MA-150	Statistics I [3]	3
or MA-302	Probability and Statistics	
MA-200	Calculus I	4
2 lab science courses		8
2 approved math or science course chosen from a department-approved list of courses [4]		7
Requirements for the Concentration in Big Data Analytics		**(9 credits)**
CS-383	Cloud, Parallel an Distributed Computing	3
CS-453	Data Mining	3
CS-483	Big Data Analytics Capstone	3
Total Credits		**81**

[1] Up to 3 credits of Internship (CS-498) and up to 3 credits of Independent Study (CS-499) may be used to satisfy the major elective requirements.

[2] 31 credits (may apply to LASC requirements). These ancillary courses cannot be taken on a pass/fail basis

[3] Students planning a Mathematics minor or a Computer Science/ Mathematics double major should take MA-302.

[4] Students planning a Mathematics minor or a Computer Science/ Mathematics double major should take math courses required for the Mathematics minor/major.

Department of Computer Science: Big Data Analytics Concentration Sample Timeline for Completion of Degree

This four-year plan assumes a Math Placement score of at least 6.

Year One

Semester One		Credits
CS-101	Basics of Computer Science	3
EN-101	College Writing I	3
MA-190	Pre-calculus (or Math/Science Course) [1,2]	4
LASC	First-Year Seminar (FYS)	3
LASC	LASC Elective (CON) [3]	3
	Credits	**16**

Semester Two		
CS-140	Introduction to Programming	4
CS-155	Computer Networking and Security	3
EN-102	College Writing II	3
MA-200	Calculus I	4
	Credits	**14**

Year Two

Semester Three		
CS-225	Discrete Structures I	3
CS-242	Data Structures	3
CS-286	Database Design and Applications	3
EN-252	Technical Writing	3

UR-230 or PH-134	Technology, Public Policy and Urban Society or Computing Ethics	3
	Credits	**15**
Semester Four		
CS-282	Unix Systems Programming	3
CS-295	Discrete Structures II	3
CM-110	Public Speaking	3
LASC	LASC Elective (GP) [3]	3
LASC	LASC Elective (CA)	3
	Credits	**15**
Year Three		
Semester Five		
CS-248	Algorithm Analysis	3
CS-254	Computer Organization and Architecture	4
CS-348	Software Process Management	3
MA-150 or MA-302	Statistics I [4] or Probability and Statistics	3
LASC	Lab Science (DAC)	3
	Credits	**16**
Semester Six		
CS-373	Operating Systems	3
CS-383	Cloud, Parallel an Distributed Computing	3
LASC	Math or Science course [2]	3-4
LASC	Lab Science (NSP)	4
LASC	LASC Elective (USW) [3]	3
	Credits	**16-17**
Year Four		
Semester Seven		
CS-453	Data Mining	3
LASC	LASC Elective (NSP) [3]	4
SELECT	General Elective	3
SELECT	General Elective	3
	Credits	**13**
Semester Eight		
CS-483	Big Data Analytics Capstone	3
LASC	LASC Elective (ICW) [3]	3
SELECT	300+ Level Elective in Major	3
SELECT	General Elective	3
SELECT	General Elective	3
	Credits	**15**
	Total Credits	**120-121**

Note:

The sequence of LASC courses marked with [3] is a suggestion but serves as a reminder that LASC designated courses must be taken to satisfy the LASC requirements.

Once LASC requirements are satisfied, students may select general requirements. Please refer to the University Catalog for specific curriculum details regarding major and LASC requirements.

Students are required to meet with their academic advisor to review their courses for the upcoming semester. A minimum of 120 credits is required for graduation. First-year and transfer students with 45 or fewer credits at the time of admission shall complete two academic programs (a major/major or major/minor) to qualify for graduation. For more information, please view the MajorPlus section of this catalog.

[1] If the students math placement score requires her/him to take MA-190, it should be taken this semester, so that MA-200 can be taken in the Spring semester. EN-101 & EN-102 satisfy LASC writing requirements.

[2] All Math and Science courses must be selected from a list of department approved courses.

[3] The sequence of LASC courses marked with [3] is a suggestion but serves as a reminder that LASC designated courses must be taken to satisfy the LASC requirements

[4] Students planning a Mathematics minor or a Computer Science/ Mathematics double major should take MA-302.