THE UNIVERSITY OF NORTH CAROLINA ASHEVILLE
FACULTY SENATE

Senate Document Number SD3823S
Date of Senate Approval 03/30/2023

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Statement of Faculty Senate Action:

APC Document 28 (CSCI): **Changes to courses in the CSCI curriculum: Change when CSCI 107 is offered; Change the title of CSCI 183; Change the prerequisite for CSCI/STAT 329; Change the title of CSCI 333; Change the number of CSCI 434 to 302; Change the prerequisite of CSCI 431; Update the listing of required courses for the Concentration in Computer Systems based on the number change from 434 to 302**

Effective Date: Fall 2023

1. **Delete:** On pages 110-111, the offering time for **CSCI 107, Introduction to Computers and Multimedia:**

107 Introduction to Computers and Multimedia (3)
A survey of computer hardware and software, networking and the Internet, the convergence of personal computers and consumer electronics, digital representation of sound and images, multimedia presentations and authoring. Includes formal labs to develop skills in useful computer applications such as spreadsheets, databases, Internet browsers and multimedia design tools. Fall and Spring.

Add: On pages 110-111, in place of deleted entry:

107 Introduction to Computers and Multimedia (3)
A survey of computer hardware and software, networking and the Internet, the convergence of personal computers and consumer electronics, digital representation of sound and images, multimedia presentations and authoring. Includes formal labs to develop skills in useful computer applications such as spreadsheets, databases, Internet browsers and multimedia design tools. See department chair.

Impact: CSCI 107 is not a required course, and although it can be used for the Scientific Perspectives requirement, it is offered very infrequently, and usually as a distance learning course for off-campus programs. This is a change to reflect our current course offering schedule, so there should be no impact except avoiding potential confusion.

Rationale: CSCI 107 has been offered twice in the last 4 years in Cherokee, NC, and although there is some interest within the department to potentially offer the course again, there are no plans to offer it with any regularity. We are leaving it in the curriculum at this time, but removing the Fall and Spring offering pattern.

2. **Delete:** On page 111, the title for CSCI 183, **Introduction to Programming: Numerical Applications:**

183 Introduction to Programming: Numerical Applications (3)
Problem solving, algorithm development, and data and procedural abstraction with an emphasis on developing scientific applications. Includes a formal laboratory section using program development tools. Students may receive credit for only one course from CSCI 182, 183 and 185. No credit given to students who have credit for CSCI 181. Fall and Spring.

Add: On page 111, in place of deleted entry:

183 Introduction to Programming: Data Science (3)
Problem solving, algorithm development, and data and procedural abstraction with an emphasis on developing scientific applications. Includes a formal laboratory section using program development tools. Students may receive credit for only one course from CSCI 182, 183 and 185. No credit given to students who have credit for CSCI 181. Fall and Spring.

Impact: This is a course name change, so there is minimal impact beyond more accurately describing the course content.

Rationale: Changing the name of CSCI 183 to "Data Science" more closely reflects the content of the course that includes importing, organizing, cleaning, and visualizing data. The old name "Numerical Applications" persisted after we redesigned the course in 2017 and the title implies a more mathematical or numerical analysis focus that is no longer applicable to the course.

3a. **Delete:** On page 112, the entry for **CSCI 329, Big Data Analytics (STAT 329):**

329 Big Data Analytics (STAT 329) (3)
The analysis of unstructured and large data sets. Topics include: preparing data for deeper analysis, breaking down the process into manageable steps, regression techniques and Bayesian approach for dealing with multivariate data, and Exploratory Data Analysis with statistics software such as SAS, R, or similar packages. Prerequisites: STAT 185 or 225, CSCI 182 or 183, or permission of instructor. Even years Spring.

Add: On page 112, in place of deleted entry:

329 Big Data Analytics (STAT 329) (3)
The analysis of unstructured and large data sets. Topics include preparing data for deeper analysis, breaking down the process into manageable steps, regression techniques and Bayesian approaches for dealing with multivariate data, and Exploratory Data Analysis with statistics software such as SAS, R, or similar packages. Prerequisites: STAT 185 or 225, and one course from CSCI 182, 183 or 185, or permission of instructor. Even years Spring.

3b. **Delete:** On page 252, the entry for **STAT 329, Big Data Analytics (CSCI 329):**

329 **Big Data Analytics (CSCI 329) (3**)
The analysis of unstructured and large data sets. Topics include: preparing data for deeper analysis, breaking down the process into manageable steps, regression techniques and Bayesian approach for dealing with multivariate data, and Exploratory Data Analysis with statistics software such as SAS, R, or similar packages. Prerequisites: STAT 185 or 225, CSCI 182 or 183, or permission of instructor. Even years Spring.

Add: On page 252, in place of deleted entry:

329 **Big Data Analytics (CSCI 329) (3**)
The analysis of unstructured and large data sets. Topics include preparing data for deeper analysis, breaking down the process into manageable steps, regression techniques and Bayesian approaches for dealing with multivariate data, and Exploratory Data Analysis with statistics software such as SAS, R, or similar packages. Prerequisites: STAT 185 or 225, and one course from CSCI 182, 183 or 185, or permission of instructor. Even years Spring.

Impact: This is a correction of an inadvertent omission, so there should be no impact. The Mathematics and Statistics department is also included in the Compliance section because CSCI/STAT 329 is cross-listed.

Rationale: The computer science department created CSCI 185 in 2017 with the intent of it being an additional intro programming option along with CSCI 182 and CSCI 183. We inadvertently neglected to add CSCI 185 to the prerequisite options at that time for CSCI/STAT 329, so this corrects that omission. It also fixes a minor typo in "Bayesian approaches".

4. **Delete**: On page 112, the title for **CSCI 333, Algorithms and Data Structures**:

333 **Algorithms and Data Structures (3)**
Data structures, efficient algorithms that use them, and their representation in programming languages. Topics include recursive analysis, randomized analysis, searching and sorting algorithms along with their data structures, order statistic selection, graph algorithms, and a selection of additional, related topics. Students will analyze their efficiency and implement them in a modern programming language. Prerequisite: grade of C or higher in CSCI 202. Fall.

Add: On page 112 in place of deleted entry:

333 **Algorithms (3)**
Data structures, efficient algorithms that use them, and their representation in programming languages. Topics include recursive analysis, randomized analysis, searching and sorting algorithms along with their data structures, order statistic selection, graph algorithms, and a selection of additional, related topics. Students will analyze their efficiency and implement them in a modern programming language. Prerequisite: grade of C or higher in CSCI 202. Fall.

Impact: This is a course title change, so there is minimal impact beyond more accurately describing the course content and avoiding confusion with a different course.

Rationale: Changing the name of our algorithms class to "Algorithms" is more appropriate. Removing the phrase "Data Structures" helps to distinguish it from CSCI 202 "Introduction to Data Structures".

5. **Delete:** On page 113, the entry for **CSCI 434, Theory of Computation:**

> **434 Theory of Computation (3)**
> A study of formal models of computation, grammars and languages, including finite state machines, regular expressions and Turing machines. Prerequisites: grade of C or higher in CSCI 202; MATH 251. See department chair.

Add: On page 111, renumbered course, **CSCI 302, Theory of Computation:**

> **302 Theory of Computation (3)**
> A study of formal models of computation, grammars and languages, including finite state machines, regular expressions and Turing machines. Prerequisites: grade of C or higher in CSCI 202; MATH 251. Fall.

Impact: Changing the course number from CSCI 434 to 302 has minimal impact. Changing the semester when the course is offered from "See department chair" to "Fall" won't have an impact since we are currently offering it every fall already. It does commit us to offering it every fall, but if demand for our courses decline substantially, we would cancel other elective courses before canceling this course since it is required in the Computer Systems concentration of the Computer Science major.

Rationale: Currently, CSCI 434 is a prerequisite for CSCI 431. It's slightly confusing to have the higher-numbered course be required before the lower-number, so lowering the number of 434 avoids that confusion. We are making it a 300-level course to appeal to more students (in our department we generally don't vary the difficulty level between 300 and 400 level courses). We are adding "Fall"to the course description rather than "See department chair" to reflect that we intend to continue to offer this course every fall semester as we have for the past several years.

6. **Delete:** On page 113, the prerequisite for **CSCI 431, Organization of Programming Languages:**

> **431 Organization of Programming Languages (3)**
> Definition and design of high-level programming languages; formal tools for language definition and specification of semantics; case studies of several languages. Prerequisite: CSCI 434. Even years Spring.

Add: On page 113, in place of deleted entry:

> **431 Organization of Programming Languages (3)**
> Definition and design of high-level programming languages; formal tools for language definition and specification of semantics; case studies of several languages. Prerequisite: CSCI 302. Even years Spring.

Impact: There is no impact to changing the prerequisite based on the course number change.

Rationale: This simply changes the prerequisite to the newly renumbered CSCI 302.

7. **Delete:** On page 110, item I under **Concentration in Computer Systems:**

I. Required courses in the major—41 hours: one course from CSCI 182, 183 or 185; CSCI 201, 202, 235, 280, 333, 335, 338, 431, 434, 480, 481; one of the following data science courses: CSCI 312, 329, 343, 346, 347, 412, 441; 6 additional hours at the 300-400 level.

Add: On page 110, in place of deleted entry:

I. Required courses in the major—41 hours: one course from CSCI 182, 183 or 185; CSCI 201, 202, 235, 280, 302, 333, 335, 338, 431, 480, 481; one of the following data science courses: CSCI 312, 329, 343, 346, 347, 412, 441; 6 additional hours at the 300-400 level.

Impact: This simply replaces CSCI 434 with CSCI 302 in the listing of courses.

Rationale: The listing of required courses needs to reflect the course number change.