Articulation Agreement by Major

Effective during the 2022-2023 Academic Year

To: California State University, Bakersfield 2022-2023 General Catalog, Semester	From: American River College 2022-2023 General Catalog, Semester

Computer Science

GENERAL INFORMATION

This articulation agreement displays lower-division course requirements specific to the major. Students should always contact an academic advisor about degree requirements for their baccalaureate major.

Helpful Resources

- CSUB Catalog
- Transfer Admission Requirements
- Academic Advising Student Centers

ABOUT THE MAJOR

Computer Science is a constantly evolving discipline. To quote the Association for Computing Machinery, "Computer Science is not simply concerned with the design of computing devices-nor is it just the art of numerical calculation. Computer Science is concerned with information in much the same sense that Physics is concerned with energy; it is devoted to the representation, storage, manipulation, and presentation of information in an environment permitting automatic information systems."

The Computer Science major at CSUB has three pathways that lead to a B.S. in Computer Science:

- **Traditional Computer Science** program follows the guidelines recommended by the Association for Computing Machinery (ACM) and the Accreditation Board for Engineering and Technology (ABET).
- **Computer Information Systems concentration** is intended for training application programmers or for those who wish to apply computer science in another discipline.
- **Information Security concentration** is intended for students who wish to pursue a career in information assurance and security, either with government agencies or with industry. Students in the three pathways will take different advanced courses of their choice. A Computer Science minor is also offered.

The Computer and Electrical Engineering and Computer Science Department moved into a new building in the Fall of 2008. The department administers its own local area network which includes multiple Unix/Linux servers, two software programming labs, a walk-in lab/tutoring center, one advanced workstation lab, an isolated network lab, an AI/visualization lab, a DSP/communications lab, one digital electronics hardware lab, a power systems/electronics lab, and a robotics/control systems lab. There is also a departmental library/major study room available to students.

An important goal of the department is to enable students to work much more closely with faculty than they would be able to at larger universities. A detailed description of student learning goals and objectives can be found at https://www.cs.csub.edu/abet/.

For additional information, visit the Department of Computer & Electrical Engineering and Computer Science.

IMPORTANT NOTE

A modification to the standard GE program has been approved that allows the possibility of satisfying some GE requirements through the major. Please see the Computer Science General Education Courses and Notes in the **CSUB catalog** for further information.

MAJOR IN COMPUTER SCIENCE

All courses in this section are required

CMPS 2010 - Programming I: Programming Fundamentals (4.00)	←	**CISP 400** - Object Oriented Programming with C++ (4.00)
CMPS 2020 - Programming II: Data Structures and Algorithms (4.00)	←	**CISP 430** - Data Structures (4.00)
CMPS 2120 - Discrete Structures (4.00)	←	**CISP 440** - Discrete Structures for Computer Science (3.00)
CMPS 2240 - Computer Architecture I: Assembly Language Programming (4.00)	←	**CISP 310** - Assembly Language Programming for Microcomputers (4.00)

MATH 2310 - Single Variable Calculus I for Engineers (4.00)	←	No Course Articulated
--- Or ---		
MATH 2510 - Single Variable Calculus I (4.00)	←	**MATH 400** - Calculus I (5.00)

MATH 2320 - Single Variable Calculus II for Engineers (4.00)	←	No Course Articulated
--- Or ---		
MATH 2520 - Single Variable Calculus II (4.00)	←	**MATH 401** - Calculus II (5.00)

PHYS 2210 - Calculus-Based Physics I (4.00)	←	**PHYS 410** - Mechanics of Solids and Fluids (5.00)
PHYS 2220 - Calculus-Based Physics II (4.00)	←	**PHYS 421** - Electricity and Magnetism (4.00)

Select 1 Course(s) from the following

BIOL 1009 - Perspectives in Biology (3.00)	←	**BIOL 303** - Survey of Biology (4.00) **--- Or ---** **BIOL 310** - General Biology (4.00)
--- Or ---		
BIOL 1039 - Principles of Ecology (3.00)	←	**BIOL 352** - Conservation Biology (3.00) **--- Or ---** **BIOL 370** - Marine Biology (4.00) **--- Or ---** **NATR 320** - Principles of Ecology (4.00)
--- Or ---		
BIOL 2010 - Introductory Biology - Cells (4.00)	←	**BIOL 400** - Principles of Biology (5.00)
--- Or ---		
CHEM 1000 - Foundations of Chemistry (3.00)	←	**CHEM 400** - General Chemistry I (5.00) • *Course is articulated in more than one agreement but credit can only apply to one*
--- Or ---		
GEOL 2010 - Physical Geology (4.00)	←	**GEOL 300** - Physical Geology (3.00) • *Course is articulated in more than one agreement but credit can only apply to one* **--- And ---** **GEOL 301** - Physical Geology Laboratory (1.00) • *Course is articulated in more than one agreement but credit can only apply to one* • *Articulates as a sequence only*
--- Or ---		
MATH 2200 - Introduction to Statistical Concepts and Methods (4.00)	←	**STAT 300** - Introduction to Probability and Statistics (4.00) **--- Or ---** **PSYC 330** - Introductory Statistics for the Behavioral Sciences (3.00) • *Course is articulated in more than one agreement but credit can only apply to one*
--- Or ---		
MATH 2533 - Multivariable and Vector Calculus (4.00)	←	**MATH 402** - Calculus III (5.00)
--- Or ---		
MATH 2540 - Ordinary Differential Equations (4.00)	←	**MATH 420** - Differential Equations (4.00)
--- Or ---		
MATH 2610 - Linear Algebra I (4.00)	←	**MATH 410** - Introduction to Linear Algebra (3.00)
--- Or ---		
PHYS 2230 - Calculus-Based Physics III (4.00)	←	**PHYS 431** - Heat, Waves, Light and Modern Physics (4.00)
--- Or ---		
SCI 1409 - Introduction to Scientific Thinking (3.00)	←	No Course Articulated

CONCENTRATION IN COMPUTER INFORMATION SYSTEMS

All courses in this section are required

CMPS 2010 - Programming I: Programming Fundamentals (4.00)	←	**CISP 400** - Object Oriented Programming with C++ (4.00)
CMPS 2020 - Programming II: Data Structures and Algorithms (4.00)	←	**CISP 430** - Data Structures (4.00)
CMPS 2120 - Discrete Structures (4.00)	←	**CISP 440** - Discrete Structures for Computer Science (3.00)
CMPS 2680 - Web Programming I (3.00)	←	**CISP 300** - Algorithm Design/Problem Solving (3.00) **--- Or ---** **CISW 300** - WEB Publishing (3.00)

MATH 2200 - Introduction to Statistical Concepts and Methods (4.00)	←	**STAT 300** - Introduction to Probability and Statistics (4.00) **--- Or ---** **PSYC 330** - Introductory Statistics for the Behavioral Sciences (3.00) • *Course is articulated in more than one agreement but credit can only apply to one*

MATH 1030 - College Algebra and Trigonometry, Dual Credit Program (3.00)	←	This Course is Never Articulated
--- Or ---		
MATH 1040 - Precalculus I and II Combined (6.00)	←	**MATH 370** - Pre-Calculus Mathematics (5.00) **--- Or ---** **MATH 375** - Pre-Calculus (6.00)
--- Or ---		
MATH 1050 - Precalculus I (4.00) **--- And ---** **MATH 1060** - Precalculus II (4.00)	←	No Course Articulated

CONCENTRATION IN INFORMATION SECURITY

All courses in this section are required

CMPS 2010 - Programming I: Programming Fundamentals (4.00)	←	**CISP 400** - Object Oriented Programming with C++ (4.00)
CMPS 2020 - Programming II: Data Structures and Algorithms (4.00)	←	**CISP 430** - Data Structures (4.00)
CMPS 2120 - Discrete Structures (4.00)	←	**CISP 440** - Discrete Structures for Computer Science (3.00)
CMPS 2240 - Computer Architecture I: Assembly Language Programming (4.00)	←	**CISP 310** - Assembly Language Programming for Microcomputers (4.00)

MATH 2310 - Single Variable Calculus I for Engineers (4.00)	←	No Course Articulated
--- Or ---		
MATH 2510 - Single Variable Calculus I (4.00)	←	**MATH 400** - Calculus I (5.00)

MATH 2320 - Single Variable Calculus II for Engineers (4.00)	←	No Course Articulated
--- Or ---		
MATH 2520 - Single Variable Calculus II (4.00)	←	**MATH 401** - Calculus II (5.00)

END OF AGREEMENT