# **Articulation Agreement by Major**

Effective during the 2022-2023 Academic Year

To: California State University, Bakersfield 2022-2023 General Catalog, Semester

From: College of Marin 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 Al/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 the	is section are required
CMPS 2010 - Programming I: Programming Fundamentals (4.00)	← No Course Articulated
CMPS 2020 - Programming II: Data Structures and Algorithms (4.00)	← COMP 220 - Data Structures and Algorithms (3.00)
CMPS 2120 - Discrete Structures (4.00)	COMP 117 - Discrete Mathematics (3.00) Same-As: MATH 117
CMPS 2240 - Computer Architecture I: Assembly Language Programming (4.00)	← COMP 160 - Computer Organization: An Assembly Language Perspective (3.00)

MATH 2310 - Single Variable Calculus I for Engineers (4.00)	← No Course Articulated
	Or
MATH 2510 - Single Variable Calculus I (4.00)	← MATH 121 - Calculus I with Applications (3.00)
	MATH 123 - Analytic Geometry and Calculus I (5.00)

MATH 122 - Calculus II with Applications (3.00)  MATH 123 - Malpix II with Applications (3.00)  MATH 123 - Calculus II with Applications (3.00)  MATH 124 - Calculus II with Applications (3.00)  MATH 125 - Calculus II with Applications (3.00)  MATH 125 - Majors Isology II with Applications (3.00)  MATH 125 - Majors Isology II with Applications (3.00)  MATH 125 - Majors Isology II with Applications (3.00)  MATH 125 - Majors Isology II with Applications (3.00)  MATH 125 - Majors Isology II with Applications (3.00)  MATH 125 - Majors Isology II with Applications (3.00)  MATH 125 - Majors Isology II with Applications (3.00)  MATH 125 - Majors Isology II with Applications (4.00)  MATH 125 - Probability and Statistics (4.00)  MATH 126 - Linear Algebra (4.00)  MATH 127 - Probability and Statistics (4.00)  MATH 128 - Elementary Differential Equations (4.00)  MATH 129 - Introduction to Statistics II (4.00)  MATH 129 - Introduction to Statistics II (4.00)  MATH 129 - Probability and Statistics (4.00)  MATH 129 - Introduction to Statistics II (4.00)  MATH 129 - Introduction to Statistics II (4.00)  MATH 129 - Probability and Statistics (4.00)  MATH 129 - Introduction to St	MATH 2220 Single Variable Calculus II for Engineers (4.00)	← No Course Articulated
MATH 122 - Calculus II with Applications (3.00)  MATH 124 - Analytic Geometry and Calculus II (5.00)  MATH 124 - Analytic Geometry and Calculus II (5.00)  MYS 2201 - Calculus Based Physics II (4.00)  MYS 2202 - Calculus Based Physics II (4.00)  Select I Course(s) from the following  OL 1009 - Perspectives in Biology (3.00)  Select I Course(s) from the following  OL 1039 - Principles of Ecology (3.00)  No Course Articulated  OC	MATH 2320 - Single Variable Calculus II for Engineers (4.00)	
MATH 124 - Analytic Geometry and Calculus II (5.00)  HYS 2210 - Calculus-Based Physics II (4.00)  Select 1 Course(s) from the following  FPHYS 2078 - Electricity and Magnetism (5.00)  FPHYS 2078 - Electricity and Magnetism (5.00)  Select 1 Course(s) from the following  No Course Articulated  OF THE SIDL 112C - Majors' Biology (3.00)  Findiples of Ecology (3.00)	MATH 2520 - Single Variable Calculus II (4.00)	
HYS 2210 - Cakulus-Based Physics I (4.00)		
Select 1 Course(s) from the following  OL 1009 - Perspectives in Biology (3.00)  Select 1 Course(s) from the following  OL 1009 - Perspectives in Biology (3.00)  No Course Articulated  OF  OF  OL 2010 - Introductory Biology - Cells (4.00)  Select 1 Course (3.00)  No Course Articulated  OF  OF  HEM 1000 - Foundations of Chemistry (3.00)  CHEM 131 - General Chemistry (1,5.00)  COURSE is articulated in more than one agreement but credit can only apply to one  COURSE is articulated in more than one agreement but credit can only apply to one  COURSE (3.00)  SECOL 120 - Physical Geology (4.00)  FEOL 2010 - Physical Geology (4.00)  FEOL 2010 - Physical Geology (4.00)  FEOL 2010 - Physical Geology (4.00)  FEOL 120 - Physical Geology (3.00)  Articulates as a sequence only  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Introduction to Statistical Concepts and Methods  FEOL 2010 - Physical Geology (3.00)  FEOL		MATH 124 - Analytic Geometry and Calculus II (5.00)
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IOL 1009 - Perspectives in Biology (3.00)  OL 1039 - Principles of Ecology (3.00)  OL 2010 - Introductory Biology - Cells (4.00)  HEM 1000 - Foundations of Chemistry (3.00)	PHYS 2220 - Calculus-Based Physics II (4.00)	← PHYS 207B - Electricity and Magnetism (5.00)
OL 1039 - Principles of Ecology (3.00)	Select 1 Course	e(s) from the following
OL 1039 - Principles of Ecology (3.00)	BIOL 1009 - Perspectives in Biology (3.00)	← No Course Articulated
OL 2010 - Introductory Biology - Cells (4.00)		Or
BIOL 112C - Majors' Biology: Molecules, Cells, Prokaryotes and Genetics (5.00)	BIOL 1039 - Principles of Ecology (3.00)	← No Course Articulated
Genetics (5.00)		Or
HEM 1000 - Foundations of Chemistry (3.00)  CHEM 131 - General Chemistry (5.00)  Course is articulated in more than one agreement but credit can only apply to one  GEOL 2010 - Physical Geology (4.00)  GEOL 120 - Physical Geology (3.00)	BIOL 2010 - Introductory Biology - Cells (4.00)	, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Course is articulated in more than one agreement but credit can only apply to one  FEOL 2010 - Physical Geology (4.00)  GEOL 120 - Physical Geology (3.00)		Or
EOL 2010 - Physical Geology (4.00)  GEOL 1201 - Physical Geology (3.00)	CHEM 1000 - Foundations of Chemistry (3.00)	CHEM 131 - General Chemistry I (5.00)
GEOL 120 - Physical Geology (4.00)  GEOL 120 - Physical Geology (3.00)		<ul> <li>Course is articulated in more than one agreement but credit can only apply to one</li> </ul>
GEOL 120 - Physical Geology (3.00)  And  GEOL 120L - Physical Geology Laboratory (1.00)  Articulates as a sequence only  Or  MATH 2200 - Introduction to Statistical Concepts and Methods Or  STAT 115 - Introduction to Statistics (4.00) Or  STAT 115 - Introduction to Statistics for Business (4.00) Or  MATH 2533 - Multivariable and Vector Calculus (4.00) Or  MATH 2540 - Ordinary Differential Equations (4.00) Or  MATH 2540 - Condinary Differential Equations (4.00) Or  MATH 2610 - Linear Algebra I (4.00) Or  MATH 116 - Linear Algebra (4.00) Or  MATH 117 - Probability and Statistics (4.00) Or  MATH 2533 - Multivariable and Vector Calculus (4.00) Or  MATH 2540 - Ordinary Differential Equations (4.00) Or  MATH 2540 - Differential Equations (4.00) Or  MATH 2540 - Linear Algebra (4.00) Or  MATH 116 - Linear Algebra (4.00) Or  MATH 117 - Probability and Statistics (4.00) Or  MATH 2540 - Ordinary Differential Equations (4.00) Or  MATH 2540 - Differential Equations (4.0		Or
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STAT 115 - Introduction to Statistics for Business (4.00)  Or  NATH 2533 - Multivariable and Vector Calculus (4.00)  Or  NATH 2540 - Ordinary Differential Equations (4.00)  Or  NATH 2610 - Linear Algebra I (4.00)  Or  NATH 2610 - Linear Algebra I (4.00)  Or  HYS 2230 - Calculus-Based Physics III (4.00)  Or  CI 1409 - Introduction to Scientific Thinking (3.00)  Or  CI 1409 - Introduction to Scientific Thinking (3.00)  Or  CI 1409 - Programming I: Programming Fundamentals (4.00)  Or  No Course Articulated  MPS 2010 - Programming I: Programming Fundamentals (4.00)  No Course Articulated	MATH 2200 - Introduction to Statistical Concepts and Methods	← MATH 115 - Probability and Statistics (4.00)
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ATH 2540 - Ordinary Differential Equations (4.00)  Or  NATH 2610 - Linear Algebra I (4.00)  Or  HYS 2230 - Calculus-Based Physics III (4.00)  Or  CI 1409 - Introduction to Scientific Thinking (3.00)  CONCENTRATION IN COMPUTER INFORMATION SYSTEMS  All courses in this section are required  MPS 2010 - Programming I: Programming Fundamentals (4.00)  Or  No Course Articulated		
ATH 2610 - Linear Algebra I (4.00)  Or  HYS 2230 - Calculus-Based Physics III (4.00)  Or  CI 1409 - Introduction to Scientific Thinking (3.00)  CONCENTRATION IN COMPUTER INFORMATION SYSTEMS  All courses in this section are required  MPS 2010 - Programming I: Programming Fundamentals (4.00)  Or  No Course Articulated		
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HYS 2230 - Calculus-Based Physics III (4.00)  — PHYS 207C - Heat, Light, Sound and Modern Physics (5.00)  — Or  CI 1409 - Introduction to Scientific Thinking (3.00)  — No Course Articulated  CONCENTRATION IN COMPUTER INFORMATION SYSTEMS  All courses in this section are required  MPS 2010 - Programming I: Programming Fundamentals (4.00)  — No Course Articulated		
HYS 2230 - Calculus-Based Physics III (4.00)		
Or CI 1409 - Introduction to Scientific Thinking (3.00) ← No Course Articulated  CONCENTRATION IN COMPUTER INFORMATION SYSTEMS  All courses in this section are required  MPS 2010 - Programming I: Programming Fundamentals (4.00) ← No Course Articulated		
CI 1409 - Introduction to Scientific Thinking (3.00)   CONCENTRATION IN COMPUTER INFORMATION SYSTEMS  All courses in this section are required  MPS 2010 - Programming I: Programming Fundamentals (4.00)   No Course Articulated	·	<u> </u>
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All courses in this section are required  MPS 2010 - Programming I: Programming Fundamentals (4.00) ← No Course Articulated		
MPS 2010 - Programming I: Programming Fundamentals (4.00)   No Course Articulated	CONCENTRATION IN COM	MPUTER INFORMATION SYSTEMS
	All courses in	this section are required
WPS 2020 - Programming II: Data Structures and Algorithms (4.00) ← COMP 220 - Data Structures and Algorithms (3.00)	CMPS 2010 - Programming I: Programming Fundamentals (4.00)	← No Course Articulated
	CMPS 2020 - Programming II: Data Structures and Algorithms (4.00)	← COMP 220 - Data Structures and Algorithms (3.00)

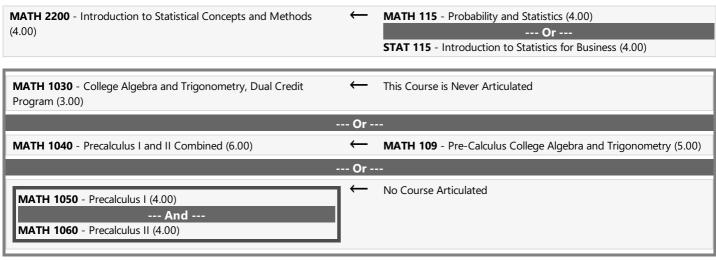
← COMP 117 - Discrete Mathematics (3.00)

Same-As: MATH 117

← No Course Articulated

CMPS 2120 - Discrete Structures (4.00)

CMPS 2680 - Web Programming I (3.00)



CONCENTRATION IN	INFORMATION SECURITY
All courses in the	is section are required
CMPS 2010 - Programming I: Programming Fundamentals (4.00)	← No Course Articulated
CMPS 2020 - Programming II: Data Structures and Algorithms (4.00)	← COMP 220 - Data Structures and Algorithms (3.00)
CMPS 2120 - Discrete Structures (4.00)	COMP 117 - Discrete Mathematics (3.00) Same-As: MATH 117
CMPS 2240 - Computer Architecture I: Assembly Language Programming (4.00)	← COMP 160 - Computer Organization: An Assembly Language Perspective (3.00)
MATH 2310 - Single Variable Calculus I for Engineers (4.00)	← No Course Articulated
MATH 2510 - Single Variable Calculus I (4.00)	<ul> <li>← MATH 121 - Calculus I with Applications (3.00)</li> <li>MATH 123 - Analytic Geometry and Calculus I (5.00)</li> </ul>
MATH 2320 - Single Variable Calculus II for Engineers (4.00)	← No Course Articulated
-	- Or  ← MATH 122 - Calculus II with Applications (3.00)

## **END OF AGREEMENT**