

# COMPUTER SCIENCE (B.S.)

Degree: Bachelor of Science

Major: Computer Science

Total Hours: 120

The computer science program at Lamar is a broad-based program emphasizing the areas of programming languages, data structures, information systems, the theory of programming languages, software engineering, networking, database, multimedia, applications of computer science, and computer architecture.

Students are required to take the ETS Computer Science Field Exam during the semester in which they are graduating. This program is also offered online.

The student who completes this four-year academic program is awarded a Bachelor of Science degree in Computer Science and is well prepared to pursue a professional career as a computer scientist or to pursue graduate work in computer science or in an area of related specialization. Advisor: Bo Sun.

| Code                                     | Title                              | Hours |
|--|------------------------------------|-------|
| <b>General Education Core Curriculum</b> |                                    |       |
| <i>Communication</i>                     |                                    |       |
| ENGL 1301                                | Composition I                      | 3     |
| Select one of the following:             |                                    | 3     |
| COMM 1315                                | Public Speaking I                  |       |
| COMM 1321                                | Business and Professional Speech   |       |
| DSDE 1371                                | ASL I                              |       |
| ENGL 1302                                | Composition II                     |       |
| FREN 1311                                | Beginning French I                 |       |
| SPAN 1311                                | Beginning Spanish I                |       |
| <i>Mathematics - 3 Hours</i>             |                                    |       |
| MATH 2413                                | Calculus and Analytical Geometry I | 4     |
| <i>Life and Physical Sciences</i>        |                                    |       |
| Select two of the following:             |                                    | 8     |
| BIOL 1406                                | General Biology I (Majors)         |       |
| BIOL 1407                                | General Biology II (Majors)        |       |
| PHYS 2425                                | University Physics I               |       |
| PHYS 2426                                | University Physics II              |       |
| <i>Language, Philosophy and Culture</i>  |                                    |       |
| Select three hours from the following:   |                                    | 3     |
| DSDE 1374                                | Introduction to Deaf Studies       |       |
| ENGL 2300                                | Close Reading II                   |       |
| ENGL 2322                                | British Literature                 |       |
| ENGL 2326                                | American Literature                |       |
| ENGL 2331                                | World Literature                   |       |
| ENGL 2376                                | African-American Literature        |       |
| FREN 2312                                | Intermediate French II             |       |
| PHIL 1370                                | Philosophy of Knowledge            |       |
| PHIL 2306                                | Ethics                             |       |
| SPAN 2312                                | Intermediate Spanish II            |       |
| <i>Creative Arts</i>                     |                                    |       |

|  |                                      |   |
|--|--------------------------------------|---|
| Select three hours from the following: |                                      | 3 |
| ARTS 1301                              | Art Appreciation                     |   |
| ARTS 1303                              | Art History I                        |   |
| COMM 1375                              | Film Appreciation                    |   |
| COSC 1324                              | The Art of Computer Game Development |   |
| DANC 2304                              | Dance Appreciation                   |   |
| MUSI 1306                              | Music Appreciation                   |   |
| MUSI 1309                              | Jazz History and Appreciation        |   |
| MUSI 1310                              | History of Rock and Roll             |   |
| PHIL 1330                              | Arts and Ideas                       |   |
| THEA 1310                              | Theatre Appreciation                 |   |

## *American History*

|                              |                           |   |
|------------------------------|---------------------------|---|
| Select two of the following: |                           | 6 |
| HIST 1301                    | U S History I 1763-1877   |   |
| HIST 1302                    | U S History II Since 1877 |   |
| HIST 2301                    | Texas History             |   |

## *Government/Political Science*

|           |                                |   |
|-----------|--------------------------------|---|
| POLS 2301 | Intro to American Government I | 3 |
| POLS 2302 | Intro/American Government II   | 3 |

## *Social/Behavioral Sciences*

|                              |  |   |
|------------------------------|--|---|
| Select one of the following: |  | 3 |
| ANTH 2346                    | Introduction to Anthropology           |   |
| ANTH 2351                    | Cultural Anthropology                  |   |
| BULW 1370                    | Business Environment and Public Policy |   |
| CRIJ 1301                    | Intro to Criminal Justice              |   |
| ECON 1301                    | Principles and Policies                |   |
| ECON 2301                    | Principles of Economics I Macro        |   |
| ECON 2302                    | Principles of Economics II Micro       |   |
| FINC 2310                    | Intro to Consumer Finance              |   |
| INEN 2373                    | Engineering Economics                  |   |
| PSYC 2301                    | General Psychology                     |   |
| PSYC 2315                    | Lifespan Development                   |   |
| POLS 1301                    | Intro to Political Science             |   |
| SOCI 1301                    | Introduction to Sociology              |   |
| SOWK 2361                    | Intro Social Work                      |   |

## *Component Area Option*

|           |                                     |   |
|-----------|-------------------------------------|---|
| ENGL 1302 | Composition II                      | 3 |
| MATH 2414 | Calculus and Analytical Geometry II | 4 |

## **Required Courses for Major**

|           |   |   |
|-----------|---|---|
| COSC 1172 | Thinking, Speaking, and Writing         | 1 |
| COSC 1173 | Programming Lab                         | 1 |
| COSC 1174 | Fundamentals of Computing II Lab        | 1 |
| COSC 1336 | Programming Fundamentals I              | 3 |
| COSC 1337 | Programming Fundamentals II             | 3 |
| COSC 2336 | Programming Fundamentals III            | 3 |
| COSC 2372 | Computer Organization Assembly Language | 3 |
| COSC 2375 | Discrete Structures                     | 3 |
| COSC 3302 | Intro to Computer Theory                | 3 |
| COSC 3304 | Algorithms Design and Analysis          | 3 |
| COSC 3308 | Design Programming Languages            | 3 |
| COSC 3325 | Computer Law and Ethics                 | 3 |
| COSC 4272 | Senior Assessment                       | 2 |

2 Computer Science (B.S.)

|           |   |   |
|-----------|---|---|
| COSC 4302 | Operating Systems                                   | 3 |
| COSC 4310 | Introduction to Computer Architecture               | 3 |
| CPSC 4317 | Computer Networks                                   | 3 |
| COSC 4333 | Distributed Systems                                 | 3 |
| CPSC 4340 | Database Design                                     | 3 |
| CPSC 4360 | Software Engineering                                | 3 |
| MATH 2318 | Linear Algebra                                      | 3 |
| MATH 3370 | Introduction to the Theory of Statistical Inference | 3 |
| One from: |   | 3 |
| COSC 4345 | Cybersecurity Networks                              |   |
| CPSC 4361 | Secure Software Engineering                         |   |
| CPSC 4363 | Cybersecurity: Systems                              |   |

**Elective Courses**

*COSC/CPSC Electives*

|                              |                               |   |
|------------------------------|-------------------------------|---|
| Select two of the following: |                               | 6 |
| COSC 3306                    | UNIX/C++                      |   |
| COSC 4301                    | Special Topics                |   |
| COSC 4319                    | Computer Graphics             |   |
| COSC 4324                    | Computer Game Development I   |   |
| COSC 4345                    | Cybersecurity Networks        |   |
| CPSC 4315                    | Network System Administration |   |
| CPSC 4330                    | Multimedia Processing         |   |
| CPSC 4361                    | Secure Software Engineering   |   |
| CPSC 4363                    | Cybersecurity: Systems        |   |
| CPSC 4370                    | Artificial Intelligence       |   |
| CPSC 4375                    | Machine Learning              |   |

*COSC/CPSC/ELEN Elective*

|                              |  |   |
|------------------------------|--|---|
| Select two of the following: |  | 6 |
| COSC 4301                    | Special Topics                         |   |
| COSC 4319                    | Computer Graphics                      |   |
| COSC 4324                    | Computer Game Development I            |   |
| COSC 4345                    | Cybersecurity Networks                 |   |
| CPSC 4315                    | Network System Administration          |   |
| CPSC 4330                    | Multimedia Processing                  |   |
| CPSC 4370                    | Artificial Intelligence                |   |
| CPSC 4375                    | Machine Learning                       |   |
| ELEN 3381                    | Electrical Analysis                    |   |
| ELEN 4486                    | Embedded Microprocessor Systems        |   |
| ELEN 4387                    | Computer Organization and Architecture |   |
| ELEN 4304                    | Advanced Topics                        |   |

*Academic Elective*

|   |  |   |
|---|--|---|
| Select any college-level course that grants semester credit hours |  | 3 |
|---|--|---|

**Total Hours** **120**

| Course            | Title                              | Hours     |
|-------------------|------------------------------------|-----------|
| <b>First Year</b> |                                    |           |
| <b>Fall</b>       |                                    |           |
| COSC 1336         | Programming Fundamentals I         | 3         |
| COSC 1173         | Programming Lab                    | 1         |
| COSC 1172         | Thinking, Speaking, and Writing    | 1         |
| ENGL 1301         | Composition I                      | 3         |
| MATH 2413         | Calculus and Analytical Geometry I | 4         |
| HIST 1301         | U S History I 1763-1877            | 3         |
| <b>Hours</b>      |                                    | <b>15</b> |

|                           |                                  |           |
|---------------------------|----------------------------------|-----------|
| <b>Spring</b>             |                                  |           |
| COSC 1337                 | Programming Fundamentals II      | 3         |
| COMM or Modern Language   |                                  | 3         |
| Social/Behavioral Science |                                  | 3         |
| ENGL 1302                 | Composition II                   | 3         |
| Lang, Phil & Culture      |                                  | 3         |
| COSC 1174                 | Fundamentals of Computing II Lab | 1         |
| <b>Hours</b>              |                                  | <b>16</b> |

**Second Year**

**Fall**

|              |                                     |           |
|--------------|-------------------------------------|-----------|
| COSC 2336    | Programming Fundamentals III        | 3         |
| MATH 2414    | Calculus and Analytical Geometry II | 4         |
| Lab Science  |                                     | 4         |
| POLS 2301    | Intro to American Government I      | 3         |
| <b>Hours</b> |                                     | <b>14</b> |

**Spring**

|                      |                              |           |
|----------------------|------------------------------|-----------|
| COSC 2325            | Computer Organization        | 3         |
| COSC 2375            | Discrete Structures          | 3         |
| POLS 2302            | Intro/American Government II | 3         |
| Approved Lab Science |                              | 4         |
| HIST 1302            | U S History II Since 1877    | 3         |
| <b>Hours</b>         |                              | <b>16</b> |

**Third Year**

**Fall**

|                         |   |           |
|-------------------------|---|-----------|
| COSC/CPSC/ELEN Elective |   | 3         |
| MATH 2318               | Linear Algebra                                      | 3         |
| COSC 3304               | Algorithms Design and Analysis                      | 3         |
| MATH 3370               | Introduction to the Theory of Statistical Inference | 3         |
| CPSC 4360               | Software Engineering                                | 3         |
| <b>Hours</b>            |   | <b>15</b> |

**Spring**

|                              |                              |           |
|------------------------------|------------------------------|-----------|
| COSC 3325                    | Computer Law and Ethics      | 3         |
| COSC 3302                    | Intro to Computer Theory     | 3         |
| COSC 3308                    | Design Programming Languages | 3         |
| Select one of the following: |                              | 3         |
| CPSC 4361                    | Secure Software Engineering  |           |
| CPSC 4363                    | Cybersecurity: Systems       |           |
| COSC 4345                    | Cybersecurity Networks       |           |
| COSC/CPSC Elective           |                              | 3         |
| <b>Hours</b>                 |                              | <b>15</b> |

**Fourth Year**

**Fall**

|                    |                   |           |
|--------------------|-------------------|-----------|
| COSC 4302          | Operating Systems | 3         |
| COSC/CPSC Elective |                   | 3         |
| Creative Arts      |                   | 3         |
| CPSC 4340          | Database Design   | 3         |
| Academic Elective  |                   | 3         |
| <b>Hours</b>       |                   | <b>15</b> |

**Spring**

|                         |                                       |            |
|-------------------------|---------------------------------------|------------|
| COSC 4333               | Distributed Systems                   | 3          |
| COSC 4310               | Introduction to Computer Architecture | 3          |
| COSC/CPSC/ELEN Elective |                                       | 3          |
| COSC 4272               | Senior Assessment                     | 2          |
| CPSC 4317               | Computer Networks                     | 3          |
| <b>Hours</b>            |                                       | <b>14</b>  |
| <b>Total Hours</b>      |                                       | <b>120</b> |

Comments:

- a. Changes and substitutions must be approved by the department chair.

- b. A grade of B or better is required in COSC 1336 Programming Fundamentals I before taking COSC 1337 Programming Fundamentals II. A grade of B or better is required in COSC 1336 Programming Fundamentals I and COSC 1337 Programming Fundamentals II before taking COSC 2336 Programming Fundamentals III.
- c. Approved Lab Science must be chosen from the following four courses: BIOL 1406 General Biology I (Majors) | BIOL 1407 General Biology II (Majors), PHYS 2425 University Physics I | PHYS 2426 University Physics II.
- d. Acceptable COSC/CPSC electives are: COSC 3306 UNIX/C+, COSC 4301 Special Topics, COSC 4319 Computer Graphics, COSC 4324 Computer Game Development I, COSC 4345 Cybersecurity Networks , CPSC 4315 Network System Administration, CPSC 4330 Multimedia Processing, CPSC 4361 Secure Software Engineering, CPSC 4363 Cybersecurity: Systems, CPSC 4370 Artificial Intelligence, CPSC 4375 Machine Learning
- e. Acceptable COSC/CPSC/ELEN electives are 3381, 4486, 4387, 4304 (with approval).
- f. Sufficient academic elective hours are required to total 120 hours. Any college-level course which offers semester credit hours is permitted.