

## Computer Science with Business Applications

| Fall Quarter  | Units | Winter Quarter  | Units | Spring Quarter  | Units |
|---|-------|---|-------|---|-------|
| <b>FIRST YEAR</b>   |       |   |       |   |       |
| CS 010A<br><i>C++ Programming I</i>                       | 4     | CS 010B<br><i>C++ Programming II</i>                        | 4     | CS 010C<br><i>Intro to Data Structures &amp; Algorithms</i> | 4     |
| ENGL 001A<br><i>Beginning Composition</i>                 | 4     | ENGL 001B<br><i>Intermediate Composition</i>                | 4     | MATH 009C<br><i>First Year Calculus</i>                     | 4     |
| ENGR 001M<br><i>Professional Dev. &amp; Mentoring</i>     | 1     | MATH 009B<br><i>First Year Calculus</i>                     | 4     | Breadth _____<br><i>Humanities/Natural Sciences</i>         | 4     |
| MATH 009A<br><i>First Year Calculus</i>                   | 4     | CS/MATH 011<br><i>Intro to Discrete Structures</i>          | 4     | Breadth _____<br><i>Humanities/Natural Sciences</i>         | 4     |
| <b>SECOND YEAR</b>  |       |   |       |   |       |
| BUS 020<br><i>Financial Accounting &amp; Reporting</i>    | 4     | MATH 010A<br><i>Multivariable Calculus</i>                  | 4     | ECON 003<br><i>Intro to Microeconomics</i>                  | 5     |
| CS 061<br><i>Machine Org. &amp; Assembly Lang. Prog.</i>  | 4     | CS 111<br><i>Discrete Structures</i>                        | 4     | MATH 031 or EE 020<br><i>Applied Linear Algebra</i>         | 5     |
| CS 100<br><i>Software Construction</i>                    | 4     | STAT 155<br><i>Probability &amp; Statistics for Engr</i>    | 4     | Breadth _____<br><i>Humanities/Natural Sciences</i>         | 4     |
| ECON 002<br><i>Intro to Macroeconomics</i>                | 5     | Breadth _____<br><i>Biological Sci (Biol 002 or</i>         | 4     | Breadth _____<br><i>Humanities/Natural Sciences</i>         | 4     |
| <b>THIRD YEAR</b>   |       |   |       |   |       |
| BUS 103<br><i>Marketing &amp; Distribution Mgmt</i>       | 4     | BUS/STAT 104<br><i>Decision Analysis &amp; Mgmt Science</i> | 4     | CS 153<br><i>Design of Operating Systems</i>                | 4     |
| CS 141<br><i>Interm. Data Structures &amp; Algorithms</i> | 4     | BUS 106/ECON 134<br><i>Intro to Financial Mgmt</i>          | 4     | ENGR 180W**<br><i>Technical Communications</i>              | 4     |
| Breadth _____<br><i>Humanities/Natural Sciences</i>       | 4     | CS Technical Elective*<br>_____                             | 4     | SOC 150<br><i>Soc. of Economic Organizations</i>            | 4     |
| Breadth _____<br><i>Humanities/Natural Sciences</i>       | 4     | ENGR 101M<br><i>Professional Dev. &amp; Mentoring</i>       | 1     | CS Technical Elective**<br>_____                            | 4     |
| <b>FOURTH YEAR</b>  |       |   |       |   |       |
| BUS Technical Elective<br>_____                           | 4     | BUS Technical Elective<br>_____                             | 4     | CS Technical Elective**<br>_____                            | 4     |
| CS Elective<br><i>CS 164, CS 166, CS 172 or CS 180</i>    | 4     | CS Technical Elective*<br>_____                             | 4     | BUS Technical Elective <sup>3</sup><br>_____                | 4     |
| CS Elective<br><i>CS 164, CS 166, CS 172 or CS 180</i>    | 4     | CS 165<br><i>Computer Security</i>                          | 4     | BUS Technical Elective <sup>3</sup><br>_____                | 4     |

Total Units: 177

Maximum Units: 222

To earn a B.S., you must complete all College and University requirements. For a complete list: [catalog.ucr.edu](http://catalog.ucr.edu).

### ENGLISH COMPOSITION\*\*

A C or better is required in three quarters of English Composition courses to satisfy the graduation requirement. ENGR 180W fulfills third quarter English Composition.

### BREADTH REQUIREMENTS

For an approved list of Breadth courses: <http://student.engr.ucr.edu/policies/requirements/breadth.html>.

#### Humanities: (3 courses)

- A. World History: \_\_\_\_\_
- B. Fine Arts/Lit./Phil./Hist: \_\_\_\_\_
- C. Human Persp. on Sci: \_\_\_\_\_

#### Natural Sciences: (4 courses)

- A. Biological Science: \_\_\_\_\_
- B. Physical Science: 1. \_\_\_\_\_
- 2. \_\_\_\_\_
- 3. \_\_\_\_\_

#### Ethnicity: (1 course)

- 1. \_\_\_\_\_

#### Upper Division: (1 course)

- 1. \_\_\_\_\_

### TECHNICAL ELECTIVES \*\*\*

Please note that Technical Electives may be offered throughout the Academic Year. Consult with your Academic Advisor about potential offerings. See approved technical electives on back.

#### Computer Science Technical Electives:

- 1. \_\_\_\_\_ 3. \_\_\_\_\_
- 2. \_\_\_\_\_ 4. \_\_\_\_\_

#### Business Administration Technical Electives:

- 1. \_\_\_\_\_ (IS) 3. \_\_\_\_\_
- 2. \_\_\_\_\_ (IS) 4. \_\_\_\_\_

Course Plan is subject to change.

# Computer Science w/Business Applications Technical Electives

## Computer Science Technical Electives:

You must complete at least 16 units of upper division Computer Science Technical Electives which must be distinct from major requirements. These 16 units may be chosen from upper division requirements or technical electives for the Computer Science Major. At least four courses must be in the Department of Computer Science and Engineering.

|         |  |              |   |
|---------|--|--------------|---|
| CS 105  | Data Analysis Methods (4)              | CS 169       | Mobile Wireless Networks (4)                  |
| CS 120A | Logic Design (5)                       | CS 170       | Introduction to Artificial Intelligence (4)   |
| CS 120B | Introduction to Embedded Systems (4)   | CS 171       | Intro to Machine Learning & Data Mining (4)   |
| CS 122A | Inter. Embedded&Real-Time Syst. (5)    | CS 172       | Introduction to Information Retrieval (4)     |
| CS 122B | Adv. Embedded & Real-Time Syst. (5)    | CS 173       | Introduction to NLP                           |
| CS 130  | Computer Graphics (4)                  | CS 175       | Entrepreneurship in Computing (4)             |
| CS 133  | Computational Geometry (4)             | CS 177       | Modeling & Simulation (4)                     |
| CS 134  | Video Game Creation & Design (4)       | CS 179 (E-Z) | Project in Computer Science (4 units maximum) |
| CS 135  | Virtual Reality (4)                    | CS 181       | Principles of Programming Languages (4)       |
| CS 145  | Combinatorial Optimization Algor. (4)  | CS 182       | Software Testing and Verification (4)         |
| CS 150  | Theory of Automata & Formal Lang. (4)  | CS 183       | UNIX System Administration (4)                |
| CS 152  | Compiler Design (4)                    | CS 193       | Design Project (4 units maximum)              |
| CS 160  | Concurrent Prog. & Parallel Syst. (4)  |              |   |
| CS 161  | Design&Architecture of Comp. Syst. (4) |              |   |
| CS 162  | Computer Architecture (4)              |              |   |
| CS 167  | Intro to BIG-DATA Management (4)       |              |   |
| CS 168  | Introduction to VLSI Design (4)        |              |   |

## Business Administration Technical Electives:

You must complete at least 16 units of upper division Business Administration Technical Electives, including at least 8 units of courses listed in the Information Systems concentration within the Business Administration major. These units must be distinct from major requirements and may be chosen from any of the available Business Administration courses.

\* Choose at least TWO from Information Systems courses:

|         |  |
|---------|--|
| BUS 125 | Simulation for Business (4)            |
| BUS 128 | Project Planning and Control (4)       |
| BUS 171 | System Analysis & Design (4)           |
| BUS 172 | Information Economics (4)              |
| BUS 173 | Introduction to Databases for Mgmt (4) |
| BUS 174 | Electronic Commerce (4)                |
| BUS 175 | Business Data Communications (4)       |

\* Choose remaining TWO from:

*ANY AVAILABLE UPPER DIVISION BUSINESS ADMINISTRATION (BUS) COURSES, EXCEPT BUS 101*

Please note the following credit exceptions:

No credit is given for BUS 101

Only one of BUS 171 or CS 180 can be taken for credit

Only one of BUS 173 or CS 166 can be taken for credit

Only one of BUS 175 or CS 164 can be taken for credit

Only one of BUS 125 or CS 177 can be taken for credit

1 Technical Electives may require that you complete additional courses as prerequisites that are not accounted for in the undergraduate program. Please go to [www.catalog.ucr.edu](http://www.catalog.ucr.edu) for course descriptions and prerequisite information.