[FALL 2011] BREN:ICS
SUGGESTED CURRICULUM

This sheet lists the general requirements for each major, and helps guide you to the major(s) that best fit with your talents and interests.

Each Bren:ICS major is designed to blend scholarship with applied learning through project courses and senior design sequences. These position graduates to be competitive in the job market or to continue on with graduate-level study.

If you are still considering your choice of major, do not worry! Keep in mind that all Bren:ICS majors share some introductory coursework, making it possible for freshmen and sophomores to switch from one Bren:ICS major to another with very little interruption to their academic planning. Even transfers sometimes make a switch early in their first year here. The Associate Dean for Student Affairs, faculty and academic counselors are available to help you sort out your choices.

Additional information about Bren:ICS degree requirements and detailed course descriptions are available in the UCI General Catalogue: www.editor.uci.edu/catalogue

For assistance, call or visit us:
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We are located in building #302:
www.uci.edu/campus_maps.php

### BUSINESS INFORMATION MANAGEMENT

**FRESHMAN**
- Informatics Core I, II and III
- Single Variable Calculus I and II
- Linear Algebra
- Fundamentals of Composition
- Critical Reading and Rhetoric
- Argument and Research
- General Education (two courses)

**SOPHOMORE**
- Principles of Accounting I and II
- Management Science
- Basic Economics I and II
- Discrete Mathematics for Computer Science
- Introduction to Probability and Statistics for Computer Science
- General Education (one course)

**JUNIOR**
- Managing Organizational Behavior
- Introduction to Management Information Systems
- Management of Information Technology
- Information Retrieval
- Introduction to Database Management
- Requirements Analysis and Engineering
- Upper-division Writing
- General Education (four courses)

**SENIOR**
- Introduction to Marketing
- Introduction to Managerial Finance
- Business Intelligence for Analytical Decisions
- Applied Econometrics for Business Operations Management
- Strategic Management
- Computer and Network Security
- Information Visualization
- Upper-division Electives (four courses)
- General Education (one course)

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### BIOMEDICAL COMPUTING

**FRESHMAN**
- Introduction to Computer Science I and II
- Fundamental Data Structures
- Single Variable Calculus I and II
- Multivariable Calculus
- Biotech Basics
- From DNA to Organisms
- From Organisms to Ecosystems
- General Education (one course)

**SOPHOMORE**
- Introduction to Computer Organization
- Introduction to Software Engineering
- Genetics
- Introduction to Computational Biology
- Discrete Mathematics
- Boolean Algebra and Logic
- Linear Algebra
- Introduction to Probability and Statistics for Computer Science
- Classical Physics (two courses)
- Classical Physics Laboratory (two courses)
- General Education (one course)

**JUNIOR**
- Representations and Algorithms for Molecular Biology
- Probabilistic Modeling of Biological Data
- Computational Systems Biology
- Design and Analysis of Algorithms
- Machine Learning and Data Mining
- General Chemistry (two courses)
- General Chemistry Laboratory (one course)
- Biology Elective
- General Education (two courses)

**SENIOR**
- Biomedical Computing Project (three courses)
- Quantitative Electives (three courses)
- Upper-division Writing
- General Education (five courses)

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### COMPUTER GAME SCIENCE

**FRESHMAN**
- Introduction to Computer Science I and II
- Fundamental Data Structures
- Computer Games and Society
- Game Systems and Design
- Game Technologies and Interactive Media
- Single Variable Calculus I and II
- Boolean Algebra and Logic
- UC Entry Level Writing
- General Education (two courses)

**SOPHOMORE**
- Introduction to Computer Organization
- Introduction to Software Engineering
- Advanced Programming with C++
- Game Engines and Hardware
- Game Engine Lab
- Discrete Mathematics for Computer Science
- Linear Algebra
- Introduction to Probability and Statistics for Computer Science
- Visual Media and Contemporary Culture
- History of Broadcasting
- New Technologies
- Basic Physics

**JUNIOR**
- Modeling and World Building
- Multiplayer Game Systems
- Multiplayer Game Project
- Computer Game Science Electives (five courses)
- General Education (three courses)

**SENIOR**
- Mobile and Ubiquitous Games
- Capstone Game Project I and II
- Computer Game Science Electives (two courses)
- General Education (two courses)
- Electives (two courses)

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1 Course titles in blue are part of the UCI general education requirements. Overlapping or previously satisfied requirements may allow students more free electives.

2 Students must choose one of the following courses for the biology elective: Neurology and Behavior, Eukaryotic and Human genetics, Systems Cell and Developmental Biology, Functional and Structural Evolutionary Genomics, High-Resolution Structures: NMR and X-ray.

2 Students choose one course from the list given in footnotes.

3 Students choose from an approved set of courses in Computer Science, Informatics, Statistics, Mathematics and Biomedical Engineering.

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1 Students choose their electives from a set of “tracks” arranged by topic areas. There are 15 tracks with Bren:ICS course options (Artificial Intelligence, Operating Systems, Simulation and Optimization, and Software Engineering, to name a few) and 4 tracks with non-Bren:ICS coursework (Mathematics, Business Management, Cognitive Science, and Film and Media Studies). Students take 3 courses from one Bren:ICS track, 2 courses from a second Bren:ICS track, and 2 courses from either a Bren:ICS or non-Bren:ICS track.

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3 Students choose from an approved set of courses in Computer Science, Informatics, Statistics, Mathematics and Biomedical Engineering.
FRESHMAN
Introduction to Computer Science I and II
Fundamental Data Structures
Single Variable Calculus I and II
Boolean Algebra and Logic
UC Entry level Writing
General Education (two courses)

SOPHOMORE
Introduction to Computer Organization
Introduction to Software Engineering
Computer Science Upper-division Core (one course)
Linear Algebra
Discrete Mathematics for Computer Science
Introduction to Probability and Statistics for Computer Science
Science electives (three courses)
General Education (three courses)

JUNIOR
Computer Science Upper-division Core
seven courses
Critical Reasoning, Introduction to Symbolic Logic
or Introduction to Abstract Mathematics
Critical Writing on Information Technology
General Education (three courses)

SENIOR
Computer Science Project (three courses)
Computer Science Upper-division Core (one course)
Computer Science Electives (two courses)
General Education (four courses)

1 Computer Science Core courses are:
  Concepts in Programming Languages I
  Compilers and Interpreters
  Principles of Operating Systems
  Digital Logic Design
  Computer Systems Architecture
  Computer Networks
  Introduction to Artificial Intelligence
  Design and Analysis of Algorithms
  One from: Formal Languages and Automata, Graph Algorithms, Principles of Computational Geometry, Introduction to Applied Cryptography, Network Optimization, Introduction to Optimization

FRESHMAN
Introduction to Computer Science I and II
Fundamental Data Structures
Single Variable Calculus I and II
Multivariable Calculus
Classical Physics (two courses)
Classical Physics Laboratory (two courses)
General Education (two courses)

SOPHOMORE
Introduction to Digital Systems
Introduction to Digital Logic Laboratory
Computing Tools for Computer Science and Engineering
Systems Engineering and Technical Communications
Network Analysis I
Infinite Series and Basic Linear Algebra
Discrete Mathematics for Computer Science
Linear Algebra
Boolean Algebra and Logic
Science Electives (two courses)
General Education (two courses)

JUNIOR
Electronic Devices and Circuits
Principles of Operating Systems
Discrete-time Signals and Systems
Software Tools and Methods
Organization of Digital Computers
Computer Networks
Design and Analysis of Algorithms
Embedded Computing Systems
Embedded Computing Systems Laboratory
Introduction to Probability and Statistics for Computer Science
General Education (two courses)

SENIOR
Senior Design Project (three courses)
Digital Signal Processing
Digital Signal Processing Laboratory
Concepts in Programming Languages I
Compilers and Interpreters
Introduction to VLSI
Track Electives (two courses)
General Education (three courses)

1 Students must choose one of the following tracks:
  Algorithms, Artificial Intelligence, Graphics/Vision, or Parallel and Distributed Computing.

FRESHMAN
Informatics Core I, II and III
Fundamental Data Structures or Patterns of Software Construction
Informatics Research Topics
Critical Reasoning
Boolean Algebra and Logic
Fundamentals of Composition
Critical Reading and Rhetoric

SOPHOMORE
Requirements Analysis and Engineering
Human Computer Interaction
Specialization Upper-division (four courses)
Basic Statistics or Introduction to Probability and Statistics for Computer Science
General Education (five courses)

JUNIOR
Software Design I
Software Tools and Methods
Social Analysis of Computerization
Senior Design Project A
Specialization Upper-division (four courses)
Upper-division Writing
General Education (four courses)
Elective

SENIOR
Senior Design Project B, C
Specialization Upper-division (two courses)
Elective (or Specialization Upper-division course)
General Education (one course)
Electives (three courses)

3 Students must choose from one of the following specializations:
  Software Engineering (SE), Human Computer Interaction (HCI), or Organizations and Information Technology (OIT).

3 The specializations in SE and HCI require 10 courses. The specialization in OIT requires 11 courses. The UCI General Catalogue (www.editor.uci.edu) has a comprehensive list of course applicable toward a specialization.

Note: The specialization in SE will be eliminated once the B.S. in Software Engineering is approved (expected in Fall 2011).

FRESHMAN
Introduction to Computer Science I and II
Fundamental Data Structures
Single Variable Calculus I and II
Boolean Algebra and Logic
Entry Level Writing
General Education (two courses)

SOPHOMORE
Introduction to Software Engineering
Introduction to Computer Organization
Information and Computer Science Intermediate (two courses)
Linear Algebra
Discrete Mathematics for Computer Science
Introduction to Probability and Statistics for Computer Science
General Education (five courses)

JUNIOR
Information and Computer Science Upper-division Core (six courses)
Upper-division Mathematics (two courses)
General Education (four courses)

SENIOR
Information and Computer Science Upper-division Core (three courses)
Information and Computer Science Project (three courses)
General Education (two courses)
Electives (two courses)

9 Information and Computer Science Core Courses are:
  Software Tools and Methods
  Concepts in Programming Languages I
  Compilers and Interpreters
  Principles of Operating Systems
  Digital Logic Design
  Computer Systems Architecture
  Social Analysis of Computerization
  Design and Analysis of Algorithms
  Introduction to Artificial Intelligence

9 Students must choose from an approved list of courses in Mathematics, Computer Science, Statistics and Philosophy.