# Program Proposal

**Form B**

<table>
<thead>
<tr>
<th>Academic Group (College): ECS</th>
<th>Date of Submission to College Dean: September 2, 2011</th>
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<tbody>
<tr>
<td><strong>Academic Organization (Department): CSC</strong></td>
<td><strong>Requested Effective: Fall___, Spring__X__, 2012__</strong></td>
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<tr>
<td><strong>Department Chair: Cui Zhang</strong></td>
<td><strong>Contact if not Department Chair:</strong></td>
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**Title of the Program** *(Please be specific; indicate minor, undergraduate or graduate degree, etc.):*

B.S. in Computer Science

**Type of Program Proposal:**

- **X** Modification in Existing Program:
  - x_ Substantive Change
  - _ Non-Substantive Change
  - _ Deletion of Existing Program

- **X** New Programs
  - Initiation (Projection) of New Program on to Master Plan
  - _ New Degree Programs
    - Regular Process
    - _ Fast Track Process
    - _ Pilot Process
  - x_ New Minor, Concentration, Option, Specialization, Emphasis
  - _ New Certificate Program

**PLEASE NOTE:** Form B is to be used only as a Cover Form. Additional information is requested for each of the above as noted in the corresponding procedure in the Policies and Procedures for Initiation, Modification, Review and Approval of Courses and Academic Programs found at http://www.csus.edu/umanual/acad.htm

**Briefly describe the program proposal (new or change) and provide a justification.**

Proposal: Create new course (CSC 135) to replace CSC 132 & CSC 136, as requirements (Part D) for the bachelor's degree. Increase the elective structure (Part E) from 9 units to 12 units. In addition, change the elective requirements (Part E) of the degree to be four electives courses OR 1 concentration. Slate of new concentrations attached.

Justification: In several areas of computer science, the computer science department offers multiple courses and wishes to recognize students who choose to focus their studies in any of these areas. This is being achieved in a unit-neutral fashion. The major's core is being reduced by one course by combining the material in two existing courses and the required number of electives is being increased by one. All students will be required to take the computer science core and either 12 elective units of their choosing or a 12 unit concentration.

**Approvals:**

- **Department Chair:**
  - [Signature]
  - Date: 9/2/2011

- **College Dean:**
  - [Signature]
  - Date: 9/19/11

- **University Committee:**
  - [Signature]
  - Date:

- **Associate Vice President and Dean for Academic Affairs:**
  - [Signature]
  - Date:
ANALYSIS OF PROGRAM CHANGE PROPOSAL
FOR THE B.S. IN COMPUTER SCIENCE
September 2, 2011

1. Form B: Attached.

2. Programmatic or Fiscal Impact on Other Academic Units’ Programs.

The Game Engineering concentration allows for students to select one of two Art classes as an elective choice. Although this could in theory generate additional demand for these Art courses, we are not requesting additional slots for CSC students in these Art courses than have already been provided because alternative electives are available. So we expect no fiscal impact.

3. Fiscal Analysis of Proposed Changes.

   a. How will the proposed changes be accommodated within department/college existing fiscal resources?

      No additional resources are needed.

   b. If the proposed changes will require additional resources, describe the level and nature of additional funding the college will seek.

      N/A.

   c. What additional space, equipment, operating expenses, library, computer, or media resources, clerical/technical support, or other resources will be needed? Estimate the cost and indicate how these resource needs will be accommodated.

      N/A.

4. New/Old Program Requirements

See the next page.
Proposed Changes:

1. Eliminate CSC 132 & CSC 136 as required courses; replace with new required course CSC 135.
2. Replace all references to CSC 132 & CSC 136 with CSC 135.
3. Reduce section D title units from 37 to 34.
4. Elective structure (section E) is modified to four electives (12 units) OR 1 concentration (12 units)
5. Add new list of concentrations to section E.

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<tr>
<th>NEW PROGRAM REQUIREMENTS</th>
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<tr>
<td><strong>D. Required Upper Division Courses (34 units)</strong></td>
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<td>(3) CSC 130</td>
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<td>(2) CSC 191</td>
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<td>(3) PHIL 103</td>
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### Electives (12 units)

In addition to the required lower-division and upper-division Computer Science courses, Computer Science majors must take four additional elective courses, totaling at least twelve (12) units. This requirement can be satisfied in one of two ways:

1. by completing a concentration (described below), or
2. by choosing from undergraduate Computer Science courses numbered CSC 140 or above (excluding CSC 192, CSC 194, CSC 195, CSC 195A, CSC 198, CSC 199).

Course choices should be made with advisor consultation. With advance written approval from their advisor, the course instructor, and the Department Chair, students with a GPA of 3.0 or greater may take graduate courses as electives. In any case students must meet the prerequisite stated in the catalog prior to taking any elective course.

#### Additional Requirements for Concentration

Certain combinations of courses give students a deeper understanding of specialized areas in Computer Science. Completion of any of the following course lists allows the student to receive a notation on their permanent record that they completed a concentration in the particular area of study. Each student can receive only one such notation. The Computer Science Department will try to offer on a regular basis all courses required for each concentration. Course cancellations and scheduling conflicts do sometimes occur, however, causing students difficulty in completing a concentration. In such situations, students may need to forgo completion of their concentration and receive a degree without any concentration notation.
### Game Engineering (12 units)
This concentration is intended to give students an opportunity to explore the science and engineering of computer games, and to prepare students for careers in those fields of computing which utilize or are heavily impacted by advances in computer gaming. These include such areas as video and strategy game development, 3-D graphics, modeling and animation and their support tools, intelligent decision making, specialized user interface hardware, machine learning, and working in interdisciplinary teams.

- **CSC 165** Computer Game Architecture and Implementation (CSC 130, CSC 133, MATH 30, PHYS 11A)
- **CSC 155** Advanced Computer Graphics (CSC 133)
- **CSC 180** Intelligent Systems (CSC 130, CSC 135, MATH 31, STAT 50)
- **Select one of the following:**
  - **CSC 159** Operating System Pragmatics (CSC 139)
  - **CSC 177** Data Warehousing and Data Mining (CSC 134, STAT 50)
  - **ART 142** 3D Computer Modeling (CSC 10 or ART 97)
  - **ART 143** 3D Computer Animation (ART 142 or CSC 126)

### Information Assurance and Security (12 units)
The Information Assurance and Security concentration is designed to help students advance their technical skills to prepare for a leadership role in planning, managing, certifying and accrediting a security and incident response plan for their organization - including methods to combat threats to organization information resources, which in today's world is becoming a top priority for many businesses since most information is in electronic form.

- **CSC 152** Cryptography (CSC 60, CSC 130, STAT 50)
- **CSC 153** Computer Forensics Principles and Practices (CSC 138)
- **CSC 154** Computer System Attacks and Countermeasures (CSC 138)
- **Select one of the following:**
  - **CSC 159** Operating System Pragmatics (CSC 139)
  - **CSC 170** Software Requirements and Specification (CSC 131)
  - **CSC 179** Software Testing and Quality Assurance (CSC 131)

### Software Engineering (12 units)
The Software Engineering concentration is
designed to focus on the principles of designing, building, testing and maintaining reliable, efficient, and secure software systems. The concentration is designed to emphasize the knowledge, competencies, and skills needed to produce competent graduates to begin a professional career in the field of software engineering, or pursue graduate programs.

(3) CSC 170 Software Requirements and Specification (CSC 131)
(3) CSC 171 Software Engineering Project Management (CSC 131)
(3) CSC 179 Software Testing and Quality Assurance (CSC 131)

(3) Select one of the following:
CSC 154 Computer System Attacks and Countermeasures (CSC 138)
CSC 174 Database Management Systems (CSC 131, CSC 134)
CSC 176 Advanced Database Management Systems (CSC 174)
CSC 177 Data Warehousing and Data Mining (CSC 134, STAT 50)

**Systems Software (12 units)**
The Systems Software concentration provides necessary background to participate in the development of low-level software for computer hardware and the software infrastructure needed by application developers. Understanding how such software operates makes students valuable additions to interdisciplinary teams where exploiting features of system tools is important. The concentration will also prepare students to design, implement, and be effective users of system tools such as language processors, utilities, and diagnostic tools.

(3) CSC 151 Compiler Construction (CSC 135)
(3) CSC 159 Operating System Pragmatics (CSC 139)

(6) Select two of the following:
CSC 142 Advanced Computer Organization (CSC 137)
CSC 148 Modeling and Experimental Design (MATH 31, STAT 50)
CSC 154 Computer System Attacks and Countermeasures (CSC 138)
CSC 155 Advanced Computer Graphics (CSC 133)
CSC 165 Computer Game Architecture and Implementation (CSC 130, CSC 133, MATH 30, PHYS 11A)