University Approval
To the Board and the Executive Director: I certify that I have read this proposal, that I believe it to be accurate, and that it has been evaluated and approved as provided by university policy.

David L. Chicoine 4/21/11
President of the University Date

After approval by the President, a signed copy of the proposal should be transmitted to the Executive Director. Only after Executive Director review should the proposal be posted on the university web site and the Board staff and the other universities notified of the URL.

1. Do you have a major in this area? X Yes* No

*SDSU’s BS in Software Engineering program will be placed on inactive status in 2013 as part of the institution’s FY2012 budget cuts.

2. If you do not have a major in this area, explain how the proposed minor relates to your mission.

3. How will the proposed minor benefit students?
The proposed Minor will provide a high-valued academic credential in software engineering that is highly sought by regional employers. In 2003, the Board of Regents approved a new BS in Software Engineering at SDSU in response to high demand by more than 20 regional employers (17 in Eastern South Dakota). The program has been a success and software engineering remains a key occupational need for South Dakota employers. Graduates from SDSU’s baccalaureate majors in computer science, electrical engineering, and mechanical engineering who complete the proposed minor will be in very high demand by employers in South Dakota.

4. Provide estimated enrollments and completions in the table below and explain how the estimates were developed.
Fiscal Years*

<table>
<thead>
<tr>
<th></th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimates</td>
<td>FY2012</td>
<td>FY2013</td>
<td>FY014</td>
<td>FY015</td>
</tr>
<tr>
<td>Students in the minor (fall)</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
</tr>
<tr>
<td>Completions by graduates</td>
<td>0</td>
<td>6</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>

* Do not include current year.

Some of the freshmen students currently enrolled in the BS in Software Engineering, which will be deactivated in 2013, will switch majors to computer science and simultaneously enroll in the proposed minor. In addition, SDSU will now redirect its recruitment activities from the BS in software engineering to the proposed Minor in Software Engineering in combination with a major in computer science, electrical engineering or mechanical engineering. It is anticipated that enrollments in the computer science, electrical engineering and mechanical engineering majors will be enhanced as the result of approving the proposed minor.

5. What is the rationale for the curriculum?
The proposed curriculum provides both depth and breadth in software engineering and was designed with primary attention for students completing a BS in computer science, electrical engineering or mechanical engineering. The minor includes a core of eight credits of foundational courses in Software Engineering, four credits of practical hands-on team design experience in software engineering, plus six credits of advanced coursework from an approved list of software engineering elective courses.

6. Complete the tables below. Explain any exceptions to BOR policy being requested.

A. Distribution of Credit Hours

<table>
<thead>
<tr>
<th>Minor in Software Engineering</th>
<th>Credit Hours</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements in Minor</td>
<td>12</td>
<td>66.7%</td>
</tr>
<tr>
<td>Electives in the Minor</td>
<td>6</td>
<td>33.3%</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>100%</td>
</tr>
</tbody>
</table>

B. Required Courses in the Minor

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Number</th>
<th>Course Title</th>
<th>New*</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SE</td>
<td>305</td>
<td>Foundations of Software Engineering</td>
<td>N</td>
<td>3</td>
</tr>
<tr>
<td>SE</td>
<td>330</td>
<td>Human Factors and User Interface</td>
<td>N</td>
<td>2**</td>
</tr>
<tr>
<td>SE</td>
<td>340</td>
<td>Software Architecture</td>
<td>N</td>
<td>3</td>
</tr>
<tr>
<td>SE***</td>
<td>464</td>
<td>Senior Design I</td>
<td>N</td>
<td>2</td>
</tr>
<tr>
<td>SE***</td>
<td>465</td>
<td>Senior Design II</td>
<td>N</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subtotal, required</td>
<td></td>
<td>12</td>
</tr>
</tbody>
</table>

* New: Y= yes, N = no.
**Current SE 330 is 3 credits; will be changed to two credits as BS in SE major transitions to inactive status in FY2013.
***Or substitute EE/ CSC/ ME 464 and 465 sequences where the team design project is for an approved software engineering application.

C. Elective Courses in the Minor: List courses that may be taken as electives in the minor. Indicate any new courses to be added specifically for the minor.
Approved elective courses (all are existing courses):
SE 320 Software Requirements and Formal Specification (3 credits)
SE 410 Software Testing and Quality Assurance (3 credits)
SE 420 Software Project Management (3 credits)
SE 440 Embedded Systems (3 credits)
EE 347 Microcontroller Systems Design (3 credits)
CSC 317 Computer Organization and Architecture (3 credits)

7. What outcomes will be expected for all students who complete the minor? How will these outcomes be achieved?

(1) Students will demonstrate an ability to identify, formulate, and solve engineering problems that can be resolved by developing software systems.

Achieved in core courses SE 305, SE 340, and SE 464/465

(2) Students will demonstrate an ability to use the techniques, skills, and modern software tools for the software engineering practice.

Achieved in core course SE 305, SE 340, SE 330, and SE 464/465, and elective course SE 410

(3) Students will demonstrate an ability to function on a design team and complete a major software engineering design project based on the knowledge and skills acquired in earlier course work and incorporating appropriate engineering standards and multiple realistic constraints.

Achieved in SE 464/465

8. What instructional technologies will be used to teach courses in the minor? This refers to the instructional technologies used to teach the new courses in the minor and NOT the technology applications students are expected to learn.

Standard contemporary classroom and laboratory technologies are used.

9. Is the University requesting authorization to provide the minor to students at an off-campus location or by distance delivery? If yes, explain. If off-campus or distance delivery authorization is not requested, enter “None.”

None

10. Costs, Budget & Resources: Explain the amount and source(s) of any one-time and continuing investments in personnel, professional development, release time, instructional technology and software, other O&M, facilities, etc needed to implement the minor.
No new resources are required to offer the proposed minor. All required courses are already offered for the BS programs in computer science and software engineering. As a result of the FY2012 budget cuts, SDSU is reorganizing its computer science program and building strength in the software engineering area. All resources required to build and maintain a strong Minor in Software Engineering are currently in place.

11. **Additional Information** Additional information is optional. Use this space to provide information not requested above. Limit the number and length of additional appendices. Identify appendices with capital letters. Letters of support are not necessary and are rarely included with Board materials. This item may be deleted if it is not used.