Computer Science Department  
Student Learning Outcome Assessment Report

1. Department/Program Mission

To fulfill this mission, the Computer Science Department strives for excellence in producing graduates who are well-rounded, grounded individuals with:

1. Strong problem solving skills grounded in a strong technical background in computer science,
2. A broad educational background that enables making interdisciplinary connections and provides a solid foundation for life-long learning,
3. The ability to communicate effectively using both written and oral communication,
4. The ability to listen and to effectively work together with others individually and in team environments, and
5. An awareness and understanding of the professional, societal, and ethical issues of the rapidly evolving computing industry and the judgment to apply this understanding, so that they may become leaders and provide a contribution to the greater good, professionally and in their community, via mentoring, writing, speaking, or professional involvement.

2. Student Learning Outcomes (SLO)

a. Campus-Wide Student Learning Outcomes:

   Programs must demonstrate that their graduates have:
   
   I. An ability to communicate effectively both orally and in writing.
   II. An ability to think critically and analyze effectively.
   III. An ability to apply disciplinary knowledge and skills in solving critical problems.
   IV. An ability to function in diverse learning and working environments.
   V. An understanding of professional and ethical responsibility.
   VI. An awareness of national and global contemporary issues.
   VII. A recognition of the need for, and an ability to engage in, life-long learning.

b. Additional Program Specific Student Learning Outcomes (Optional)

Have professional preparation through professional organizations, interaction with professionals at both on and off campus activities, internships, co-ops, field-trips, and capstone courses.
### 3. Curriculum Mapping to Campus and/or Program Outcomes

#### 4. Methods/Instruments and Administration

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<tr>
<th>COURSE</th>
<th>CS Program Outcomes Assessed</th>
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<tbody>
<tr>
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<tr>
<td>CS 001</td>
<td>Data Item: Term Paper</td>
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<td>Rubric: Ethics</td>
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<td>CS 053</td>
<td>Data Item: Programming, Programming</td>
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<td>Rubric: Programming 1-6</td>
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<tr>
<td>CS 153</td>
<td>Data Item: Exams</td>
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<td>Rubric: Algorithms 2</td>
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<td>CS 206</td>
<td>Data Item: Assignments, Projects</td>
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<td>Rubric: Systems Engineering 1-4</td>
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<tr>
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<td>CS 236</td>
<td>Data Item: Homework Assignments Rubric: Teamwork</td>
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<td>CS 238</td>
<td>Data Item: Programming Rubric: Programming</td>
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<tr>
<td>CS 253</td>
<td>Data Item: Exams Rubric: Theory 1-3</td>
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<tr>
<td>CS 284</td>
<td>Data Item: Programs Rubric: Operating Systems 2, 3, 6, Programming 1, 2</td>
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### 5. Results and Changes Implemented or Planned

**a. Findings**

**CS001 – Introduction to Computer Science**

**Ethics:** Students meet departmental standards in ethics education at the introductory level, although relevance alone does not meet the standard.

**CS053 – Introduction to Programming**

**Programming:** Students meet the departmental standard in technical background on the programming rubric.

**CS153 – Data Structures**

**Programming:** Students meet departmental standards for Programming assessing Current Tools & Techniques

**Algorithms:** Students meet departmental standards for Algorithms assessing Life Long Learning.
Based on the evaluation numbers, our students did very well on the applying, creating, and testing sorting algorithms. On the most difficult algorithms (quick and merge) the students obtained the highest marks. On hashing, where there was no programming assignment or homework, the students earned the lowest marks.

**CS206 – Software Engineering**

*Systems Design and Engineering:* Students partially meet departmental standards for Systems Design and Engineering for Broad Background: systems modeling marginally fail the standards.

*Communication:* Students meet departmental standards for Communication Review assessing Teamwork and Oral Communication

*Written Communication:* Students meet departmental standards for Communication Review assessing Teamwork and Oral Communication

**CS236 – Programming Languages & Translators**

*Teamwork:* Students meet departmental standards for Teamwork.

*Programming and Algorithms:* Students meet departmental standards for Algorithms and Programming assessing Current Skills and Techniques

**CS238 – File Structures and Introduction to Database Systems**

*Programming and Algorithms:* Students meet departmental standards for Algorithms and Programming assessing technical background.

*Written Communication:* Students meet the departmental standards for written communication.

**CS253 – Algorithms**

*Theory:* Students meet departmental standards for Theory assessing Technical Background

*Written Communication:* Students meet departmental standards for Writing assessing Written Communications

*Programming:* Students do not meet departmental standards for Programming assessing Current Tools and Techniques

**CS284 – Operating Systems**

*Operating Systems:* Students meet departmental standards for Operating Systems

**CS397 – Software Systems Development**

*Communication:* Students meet departmental standards for Presentation Review assessing Oral Communication

*Peer Review:* Students meet departmental standards for Peer Review assessing Lifelong Learning and Group Work

*Management:* Students meet departmental standards for Management Review assessing Group Work, Professional Preparation, and Lifelong Learning
b. Use of Results for Identified Improvement

CS001 – Introduction to Computer Science

Ethics: The failure to meet the relevance standard is indicative of a lack of appreciation of ethics which is possibly correlated with the indirect assessment of A.1.1, A.1.2. Comprehensive treatment of ethics in the curriculum was undertaken in the 2009-2010 academic year by the undergraduate curriculum committee resulting in the inclusion of Engineering Ethics as a required course for Computer Science majors.

CS153 – Data Structures

Disciplinary Knowledge: Students meet standards. When compared to the rest of the programming assignments, the grades earned on the assessed assignment and exam are uncharacteristically high. This portion of the class could take more rigor or at least some minor changes to ensure that students are not pulling code off of the internet or from previous semester’s students. In the very least, hashing needs more attention. This will be addressed in additional homework and programming assignment problems. Additional material (such as introduction to asymptotic complexity or loop invariants) can be added to this phase of the class to increase the challenge, knowledge gained, and to provide a more easy transition into the next class in the curriculum (CS253).

CS206 – Software Engineering

Systems Design and Engineering: The overall scores are marginal indicating a general lack of preparation in modeling issues. The course will be improved to broaden the representation of Software Engineering topics and enhance systems skills. It will be assessed again in the Academic Year 2009-10.

CS253 – Algorithms

Disciplinary Knowledge: Students do not meet departmental standards for Programming assessing Current Tools and Techniques. This was addressed with assignments that require more analysis during the 2009-10 AY. This also impacts ABET outcome J, making decisions on algorithm choices. Refined measures to assess this will be implemented for the 2011 data collection.