The faculty of the Department of Computer and Information Science at the University of Mississippi has established the following means of assessing its undergraduate programs. (These are documented in Appendix I of the BSCS Self-Study Report prepared for ABET/CAC.)

- **Assessment Exams for BSCS Core Courses**
  - AE111 — 30 questions given in each offering of CSCI 111
  - AE112 — 30 questions given in each offering of CSCI 112
  - AE211 — 30 questions given in each offering of CSCI 211
  - AE223 — 30 questions given in each offering of CSCI 223
  - AE300 — 30 questions given in each offering of CSCI 300
  - AE311 — 30 questions given in each offering of CSCI 311
  - AE387 — 30 questions given in each offering of CSCI 387
  - AE423 — 30 questions given in each offering of CSCI 423
  - AE433 — 30 questions given in each offering of CSCI 433
  - AE450 — 30 questions given in each offering of CSCI 450
  - AE487 — 50 questions given in each offering of CSCI 487

- **Faculty Evaluation of CSCI 487 Senior Projects**
  - SP1 — assess whether the Senior Project is satisfactory
  - SP2 — assess 10 characteristics of the Senior Project oral presentation

- **Exit Survey / CSCI 487 Students Evaluate Themselves**
  - ES1 — assess 6 characteristics of confidence in computer programming
  - ES2 — assess 8 characteristics of ability as a technical presenter
  - ES3 — assess 10 characteristics of ability to function as a team member

- **Other**
  - WR1 — faculty evaluation of writing skills; assess 18 characteristics of CSCI 300 papers
  - TW1 — peer evaluation of teammates in CSCI 387; assess 10 characteristics of teamwork
  - AL1 — alumni survey
  - EM1 — employer survey
**Assessment Exams**

**BSCS Educational Objective:** *Graduates will be capable of solving Computer Science problems of difficulty appropriate to their experience level.*

Corresponds to the following BSCS Program Outcomes — An ability to:

a. apply knowledge of computing and mathematics that are appropriate to the discipline  
b. analyze a problem and identify and define the computing requirements appropriate to its solution  
c. design, implement, and evaluate a computer-based system, process, component, or program to meet requirements  
i. use current techniques, skills, and tools necessary for computing practice  
j. apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design decisions  
k. apply design and development principles in the construction of software systems of varying complexity

**BSCS Educational Objective:** *Graduates will demonstrate social responsibility.*

Corresponds to the following BSCS Program Outcomes —

e. an understanding of professional, ethical, legal, security, and social issues and responsibilities  
g. an ability to analyze the local and global impact of computing on individuals, organizations, and society

Means of Assessment — AE111, AE112, AE211, AE223, AE300, AE311, AE387, AE423, AE433, AE450, and AE487. Each of the 350 multiple-choice questions on these 11 exams has been indirectly mapped to one or more BSCS program outcomes (a–k). This has been achieved by first mapping each question to one of 42 categories defined by the department’s faculty, and then mapping each category to one or more outcomes.

Criterion for Success — For each outcome, at least 70% of the assessment questions mapped to the outcome are answered correctly by the students.

Measurement Based on the Assessment Exams Given in Fall 2007 — The criterion was met for outcomes a, c, e, g, and j, but was not met for outcomes b, i, and k. However, the calculation was done for all students taking the assessment exams and was not limited to BSCS students.
Measurement Based on the Assessment Exams Given in Spring 2008 to BSCS Students — The criterion was met for all outcomes except a and i.

<table>
<thead>
<tr>
<th>Course</th>
<th>Fall 2007 – All Students</th>
<th>Spring 2008 – BSCS Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>111</td>
<td>78</td>
<td>—</td>
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<tr>
<td>112</td>
<td>84</td>
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<tr>
<td>211</td>
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<tr>
<td>223</td>
<td>63</td>
<td>61</td>
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<tr>
<td>300</td>
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<tr>
<td>311</td>
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<tr>
<td>387</td>
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<td>75</td>
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<td>423</td>
<td>46</td>
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<tr>
<td>433</td>
<td>—</td>
<td>61</td>
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<tr>
<td>450</td>
<td>73</td>
<td>—</td>
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<tr>
<td>487</td>
<td>64</td>
<td>62</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ABET Outcome</th>
<th>Fall 2007 – All Students</th>
<th>Spring 2008 – BSCS Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>74</td>
<td>69</td>
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<tr>
<td>b</td>
<td>58</td>
<td>70</td>
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<tr>
<td>c</td>
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<td>g</td>
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<td>i</td>
<td>60</td>
<td>68</td>
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<tr>
<td>j</td>
<td>72</td>
<td>70</td>
</tr>
<tr>
<td>k</td>
<td>68</td>
<td>72</td>
</tr>
</tbody>
</table>

Use of Results — No changes to the courses or the curriculum have been adopted at this time.

The faculty is discussing ways to improve the students’ mastery of practical programming knowledge and skills, but no solution strategies have yet emerged that have widespread support. Items considered include changing the programming language used in the CSCI 111-112-211 sequence, introducing a new programming-intensive course at the junior level, refining the content of various courses, and requiring standard use of specific tools, such as IDEs and version management software.

The faculty is also discussing possible refinements of the assessment exams themselves.
The faculty is considering how better to manage the data collection and processing. Charles Jenkins, the instructor who left after spring 2007, supervised a spring 2007 senior project that developed a data management and analysis system. However, this system, which makes extensive use of Microsoft Access, has proved more difficult for others to use and maintain than desired.

The TracDat system, recently adopted and deployed by the University assessment office, provides the capability to store raw and analyzed data, spreadsheets, etc., in a system maintained centrally and is being used across campus. The faculty will consider how to use this system more fully in the coming year. Dr. Rice and Dr. Wilkins have attended the training meetings for the software.
**BSCS/BA CS Outcome (SACS): Students completing the degree will understand the ethical responsibilities of a practicing computer professional.**

Means of Assessment — Five ethics questions in AE300 and two ethics questions in AE487.

Criterion for Success — On each question, at least 80% of the students will answer correctly.

Measurement Based on the Assessment Exams given in Fall 2007 and Spring 2008 — The criterion was met for both questions in AE487 but was met for only one of the five questions in AE300.

Use of Results — The faculty decided to give greater emphasis to ethical issues in CSCI 300.

It has been suggested that we include other means of assessment for this outcome, perhaps using the exit and alumni surveys to collect data. We have not yet decided upon this approach.
• Faculty Evaluation of CSCI 487 Senior Projects
  o SP1 — assess whether the Senior Project is satisfactory

BSCS/BA CS Outcome (SACS): *Students completing the degree will be capable of providing a solution to a problem relating to Computer Science. The problem will have scope similar to a problem assigned to a new computer scientist entering industry or graduate school.*

Means of Assessment — SP1. Faculty members assess whether each Senior Project "satisfactorily addresses the areas of complexity ... on a level that would be expected of a new computer scientist entering industry or graduate school."

Criterion for Success — Faculty members agree unanimously that a Senior Project is satisfactory, for at least 80% of the Senior Projects.

Measurement Based on the Senior Projects in Fall 2007 and Spring 2008 — Faculty members agreed unanimously that 73% of the Senior Projects (11 of 15) were satisfactory; therefore, the criterion was not met.

Use of Results — In Spring 2008, the department’s faculty adopted a “C or better” rule that requires students to earn at least a C in each prerequisite of a core course to proceed to the next course. The motivation is to make sure that all students sufficiently master the needed knowledge and skills. This change has been implemented for the spring 2009 preregistration registration period.

At the 2008 Fall conference, the faculty decided to give an award to the student who produced the Best Senior Project in 2008-9 to further encourage the development of high quality projects.
• **Faculty Evaluation of CSCI 487 Senior Projects**
  o **SP2** — assess 10 characteristics of the Senior Project oral presentation

**BSCS Educational Objective:** *Grades will function effectively as leaders and as members of teams.*

Corresponds to the following BSCS Program Outcome — An ability to:
  f. communicate effectively with a range of audiences

**BSCS/BA CS Outcome (SACS):** *Students completing the degree will be proficient in relating technical concepts through oral communication.*

Means of Assessment — SP2. Faculty members assess ten characteristics of each Senior Project oral presentation.

Criterion for Success — Faculty members agree unanimously that all ten characteristics of a Senior Project oral presentation are satisfactory, for at least 80% of the Senior Projects.

Measurement Based on the Senior Projects in Spring 2007, Fall 2007, and Spring 2008 — Faculty members agreed unanimously that 50% of the Senior Projects (14 of 28) were satisfactory for all ten characteristics; therefore, the criterion was not met.

Use of Results: At the 2008 Fall conference, the faculty decided to give an award to the best presentation by a Senior Project student in 2008-9 to further encourage the development of high quality presentations. Discussions are ongoing on other ways to improve student presentation skills.

Instructors of Senior Project were encouraged to spend one class period on developing presentations using PowerPoint, or some other presentation development software.
• Exit Survey / CSCI 487 Students Evaluate Themselves
  o ES1 — assess 6 characteristics of confidence in computer programming

BSCS/BA CS Outcome (SACS): Students completing the degree will be capable of providing a solution to a problem relating to Computer Science. The problem will have scope similar to a problem assigned to a new computer scientist entering industry or graduate school.

Means of Assessment — ES1. Senior Project students complete an Exit Survey in which they assess their confidence in handling six different aspects of computer programming in a new job or as a new master's student.

Criterion for Success — At least 70% of the students are confident in their ability to handle at least four of the six aspects of programming.

Measurement Based on the Exit Surveys Completed in Fall 2007 and Spring 2008 — 100% of the students were confident in their ability to handle at least five of the six aspects of programming; therefore, the criterion was met.

Use of Results: No changes seem warranted at this time based on this assessment.
• Exit Survey / CSCI 487 Students Evaluate Themselves
  o ES2 — assess 8 characteristics of ability as a technical presenter

BSCS Educational Objective: *Graduates will function effectively as leaders and as members of teams.*

Corresponds to the following BSCS Program Outcome — An ability to:
  f. communicate effectively with a range of audiences

BSCS/BA CS Outcome (SACS): *Students completing the degree will be proficient in relating technical concepts through oral communication.*

Means of Assessment — ES2. Senior Project students complete an Exit Survey in which they assess their own ability in eight different aspects of giving a technical presentation.

Criterion for Success — At least 70% of the students feel they are capable in at least six of the eight aspects of giving a technical presentation.

Measurement Based on the Exit Surveys Completed in Fall 2007 and Spring 2008 — 100% of the students felt they were capable in all eight aspects; therefore, the criterion was met.

Use of Results: No changes seem warranted at this time based on this assessment.
• **Exit Survey / CSCI 487 Students Evaluate Themselves**
  - **ES3** — assess 10 characteristics of ability to function as a team member

**BSCS Educational Objective:** *Graduates will function effectively as leaders and as members of teams.*

Corresponds to the following BSCS Program Outcome — An ability to:
  
  d. function effectively on teams to accomplish a common goal

**BSCS/BA CS Outcome (SACS):** *Students completing the degree will be proficient in working in a team.*

Means of Assessment — **ES3.** Senior Project students complete an Exit Survey in which they assess their own ability in ten different aspects of teamwork.

Criterion for Success — At least 70% of the students feel they are capable in at least seven of the ten aspects of teamwork.

Measurement Based on the Exit Surveys Completed in Spring 2008 — 100% of the students felt they were capable in all ten aspects; therefore, the criterion was met.

Use of Results: No changes seem warranted at this time based on this assessment.
• Other
  o WR1 — faculty evaluation of writing skills; assess 18 characteristics of CSCI 300 papers

BSCS Educational Objective: Graduates will function effectively as leaders and as members of teams.

Corresponds to the following BSCS Program Outcome — An ability to:
  f. communicate effectively with a range of audiences

Means of Assessment — WR1. Students in CSCI 300 write a paper on a topic of ethical or professional significance. The CSCI 300 instructor selects a representative sample of these papers, which are evaluated using a standard rubric by faculty members and/or graduate students.

Criterion for Success — Students receive an average score of at least 70%, for each of the following categories: organization, content, miscellaneous characteristics, and overall impression.

Measurement Based on the Papers Written in CSCI 300 in Fall 2005 — The criterion was met for faculty evaluations for each category.

Measurement Based on the Papers Written in CSCI 300 in Fall 2006 and Fall 2007 — Six papers from Fall 2006 and six papers from Fall 2007 are being evaluated by a team of faculty members. This evaluation is underway.
Other

- TW1 — peer evaluation of teammates in CSCI 387; assess 10 characteristics of teamwork

**BSCS Educational Objective**: Graduates will function effectively as leaders and as members of teams.

Corresponds to the following BSCS Program Outcome — An ability to:

d. function effectively on teams to accomplish a common goal

**BSCS/BACS Outcome (SACS)**: Students completing the degree will be proficient in working in a team.

Means of Assessment — TW1. CSCI 387 students rate the performance of each member of their team (including themselves) by distributing 100 points among the team members for each of the following ten areas: availability, punctuality, responsiveness, creativity, leadership, cooperation, openness to direction, attitude, effort, and effectiveness.

Criterion for Success — At least 70% of the students receive a rating of at least 90% for each of the ten areas.

Measurement Based on the Evaluations Completed in Spring 2007 and Spring 2008 — 69% of the students (22 of 32) received a rating of at least 90% for each of the ten areas; therefore, the criterion was not met.

Use of Results: CSCI 387 is the core course with a required team component. It is only taught in the spring semester. Because of the departure of the instructor who taught CSCI 387 for the past 3 years, a different instructor will be teaching the course during spring 2009. As that course is planned, the new instructor and other faculty members will consider how to encourage and to measure teamwork. The faculty is also discussing whether other required team exercises are needed. There is some dissatisfaction with the current means of assessment, which may result in refinement of this instrument.
• Other
  o AL1 — alumni survey

BSCS Educational Objective: Graduates will demonstrate social responsibility.

Corresponds to the following BSCS Program Outcomes —
  e. an understanding of professional, ethical, legal, security, and social issues and responsibilities
  g. an ability to analyze the local and global impact of computing on individuals, organizations, and society

Means of Assessment — AL1. Graduate responses to survey question “My undergraduate training prepared me for ethical and social responsibility issues in the workplace.”

Criterion for Success — At least 90% of the graduates answer either Strongly Agree or Agree.

Measurement Based on Alumni Survey in Spring/Summer 2008 — 100% of the students agreed or strongly agreed with the statement.

Use of Results: The criterion was met, and no changes are indicated.

BSCS Educational Objective: Graduates will engage in continuing professional development.

Corresponds to the following BSCS Program Outcome —
  h. recognition of the need for, as well as an ability to engage in, continuing professional development

Means of Assessment — AL1. Graduate responses to the survey question “I have engaged in continuing professional development”, and the methods of professional development indicated.

Criterion for Success — 100% of graduates answer Strongly Agree or Agree to having engaged in professional development, and indicate at least two forms.

Measurement Based on Alumni Survey in Spring/Summer 2008 — 100% of the students Agreed or Strongly Agreed that they engaged in continuing professional development. Individually they engaged in two to five forms of professional development, with the average of about 3.4 forms per student.

Use of Results: The criterion was easily met and no program changes are indicated.
• Other
  o EM1 — employer survey

BSCS Educational Objective: Graduates will demonstrate social responsibility.

Corresponds to the following BSCS Program Outcomes —
  f. an understanding of professional, ethical, legal, security, and social
     issues and responsibilities
  i. an ability to analyze the local and global impact of computing on
     individuals, organizations, and society

Means of Assessment — EM1. Phone survey/interview with employers of
graduates permitting it and who were employed by the employer by at least 6
months.

Criterion for Success — 100% of the employers Agree or Strongly Agree that the
graduate has demonstrated social responsibility on the job.

Measurement Based on Alumni Survey in Spring/Summer 2008 — 100% of the
employers Strongly Agreed or Agreed that the graduate demonstrated social
responsibility.

Use of Results: The criterion was met, so no program changes are indicated.

BSCS Educational Objective: Graduates will engage in continuing professional
development.

Corresponds to the following BSCS Program Outcome —
  j. recognition of the need for, as well as an ability to engage in,
     continuing professional development

Means of Assessment — EM1. Phone survey/interview with employers.

Criterion for Success — 100% of the employers Agree or Strongly Agree that the
graduate has continued in professional development.

Measurement Based on Alumni Survey in Spring/Summer 2008 — 100% of the
employers Strongly Agreed that the graduate had engaged in continuing
professional development, so the criterion was easily met.

Use of Results: The employers were very impressed by the enthusiasm of the
graduates to be self-directed and learn skills as required, so no changes are
indicated.