Program (Major, Minor, Core): Bachelor of Science in Computer Science  
Department: Mathematics and Computer Science  
College/School: College of Arts and Sciences  
Person(s) Responsible for Implementing the Plan: Program Director and Assessment Coordinator  
Date Submitted: December 1, 2015  

<table>
<thead>
<tr>
<th>Program Learning Outcomes</th>
<th>Curriculum Mapping</th>
<th>Assessment Methods</th>
<th>Use of Assessment Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>What do you expect all students who complete the program to know, or be able to do?</td>
<td>Where is the outcome learned/assessed (courses, internships, student teaching, clinical, etc.)?</td>
<td>How do students demonstrate their performance of the program learning outcomes? How does the program measure student performance? Distinguish your direct measures from indirect measures.</td>
<td>How does the program use assessment results to recognize success and &quot;close the loop&quot; to inform additional program improvement? How/when is this data shared, and with whom?</td>
</tr>
</tbody>
</table>
| (a) to apply knowledge of computing and mathematics appropriate to the discipline | CSCI 1300, 2100, 2300, 2400, 3100, 3200, 3300, 3500, 4961, 4962; MATH 1510, 1520, 1660 | Direct Measures:  
- Course-level outcome assessment  
- Student academic performance  
Indirect Measures:  
- Student course evaluations  
- Self-assessment on survey of graduating students  
- Self-assessment from alumni survey (3-6 years post graduation)  
- Feedback from industry advisory board  
> Assessment data will be collected and analyzed according to the timeline given below. An assessment report will be shared annually with all Computer Science faculty, and discussed in a dedicated department meeting, after which continued improvements will be considered to the program as well as the assessment plan. The assessment plan will also be shared with upper-level administrators. |
| (b) to analyze a problem, and identify and define the computing requirements appropriate to its solution | CSCI 1300, 2100, 2300, 3100, 3300, 4961, 4962 | Direct Measures:  
- Course-level outcome assessment  
- Student academic performance  
Indirect Measures:  
- Student course evaluations  
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| (c) to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs | Direct Measures:  
- Course-level outcome assessment  
- Student academic performance  
Indirect Measures:  
- Student course evaluations  
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| CSCI 1300, 2100, 2300, 3300, 3500, 4961, 4962 | | |
| (d) to function effectively on teams to accomplish a common goal | Direct Measures:  
- Course-level outcome assessment  
- Student academic performance  
Indirect Measures:  
- Student course evaluations  
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| CSCI 2300, 3300, 4961, 4962 | | |
| (e) to have an understanding of professional, ethical, legal, security and social issues and responsibilities | PHIL 2050, 3410 | Direct Measures:  
- Course-level outcome assessment  
- Student academic performance  
Indirect Measures:  
- Student course evaluations  
- Self-assessment on survey of graduating students  
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| (f) to communicate effectively with a range of audiences | CSCI 3100, 4961, 4962; PHIL 3410; ENGL 1900; general core | Direct Measures:  
- Course-level outcome assessment  
- Student academic performance  
Indirect Measures:  
- Student course evaluations  
- Self-assessment on survey of graduating students  
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<th>Indirect Measures:</th>
<th>Notes</th>
</tr>
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| PHIL 3410 | • Course-level outcome assessment  
• Student academic performance | • Student course evaluations  
• Self-assessment on survey of graduating students  
• Self-assessment from alumni survey (3-6 years post graduation) | Assessment data will be collected and analyzed according to the timeline given below. An assessment report will be shared annually with all Computer Science faculty, and discussed in a dedicated department meeting, after which continued improvements will be considered to the program as well as the assessment plan. The assessment plan will also be shared with upper-level administrators. |
| CSCI 4961, 4962 | | • Self-assessment on survey of graduating students  
• Self-assessment from alumni survey (3-6 years post graduation)  
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| (i) to use current techniques, skills, and tools necessary for computing practice | CSCI 2100, 2300, 3200, 3300, 3400, 3500, 4961, 4962 | Direct Measures:  
  • Course-level outcome assessment  
  • Student academic performance  
Indirect Measures:  
  • Student course evaluations  
  • Self-assessment on survey of graduating students  
  • Self-assessment from alumni survey (3-6 years post graduation)  
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| (j) to apply mathematical foundations, algorithmic principles, and computer science theory in modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices | CSCI 2100, 3100; MATH 1510, 1520, 1660 | Direct Measures:  
  • Course-level outcome assessment  
  • Student academic performance  
Indirect Measures:  
  • Student course evaluations  
  • Self-assessment on survey of graduating students  
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(k) to apply design and development principles in the construction of software systems of varying complexity

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| CSCI 2300, 3200, 3300, 4961, 4962 | • Course-level outcome assessment  
| | • Student academic performance  

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1. **It is not recommended** to try and assess (in depth) all of the program learning outcomes every semester. It is best practice to plan out when each outcome will be assessed and focus on 1 or 2 each semester/academic year. **Describe the responsibilities, timeline, and the process for implementing this assessment plan.**

   Course-level assessment will be performed each semester, on a rotating cycle so that each individual course-level outcome is assessed at least once every three years. Before the start of each semester, the Assessment Coordinator will inform an instructor which, if any, of the course-level outcomes are to be evaluated. Instructors are responsible for performing the assessment with embedded measures and completing the Course Assessment Report, with each student’s performance toward each assessed outcome categorized as *Exceeding*, *Meeting*, or *Failing*. The course assessment reports will be collected and summarized by the Assessment Coordinator. The benchmark goal is for 80% of students to meet or exceed each course-level outcome.

   Students’ academic performance will be assessed at the end of each academic year in conjunction with the evaluation of each student’s continuation in the major. Grades in all computer science courses will be collected by the Program Director through automated institutional reports which are drawn from the student record system. The benchmark goal is for all majors to have a GPA of 2.0 or greater in their computer science courses for the major, and for 75% of the majors to have such a GPA of 2.5 or greater.

   Student course evaluations will be distributed and collected at the conclusion of each course offering. Currently these evaluations are collected on paper and returned by a representative student to the department office. We will explore a transition to an online system for
collection of these evaluations. At the end of each academic year, the Program Director will review all course evaluations and provide a summary report to the Assessment Coordinator. The benchmark goal is for each course to receive an average rating of “Good” or better for each quantitative question.

A survey of graduating students is conducted at the conclusion of each academic year. This survey includes a self-assessment of the student’s confidence toward meeting each the 11 program learning outcomes, open-ended questions about his or her experiences in the program and courses, and queries about internships which the student has completed and future academic or career plans. The survey is conducted online and results are gathered and summarized by the Program Director. A benchmark goal is for at least 95% of the graduating students to self-identify as either “confident” or “very confident” measured along each of the individual student learning outcomes.

Our plan is to develop a new alumni survey that would be administered once every 3 years, to include all students who are 3-6 years post-graduation. The survey will reflect on the students’ experiences and preparedness from their time in the academic program, and their continued professional development since graduating. Appropriate benchmarks will be developed once the form of the survey has been better designed.

Our plan is to convene an Industry Advisory Board for Computer Science during AY16-17, and henceforth to have that body meet every 1 or 2 years to discuss trends in the field, to provide opinions about the academic program and curriculum, and to potentially provide feedback to the preparedness of graduates who have continued into industry.

2. Please explain how these assessment efforts are coordinated with Madrid (courses and/or program)?

Both program-level and course-level assessment plans will be shared with appropriate colleagues in Madrid, ideally in both draft and final form, whenever changes are made to the plans. Feedback from Madrid may be used to further shape the assessment plans. All computer science course offerings at the Madrid campus should adhere to the same curricular expectations and assessment procedures, minimally including the completion of a Course Assessment Report and the collection of student course evaluations for each offering. At the end of each academic year, a designated Madrid Assessment Liaison for Computer Science should send the collection of course assessment data to the Assessment Coordinator in St. Louis. The annual assessment report, and any more detailed discussions of assessment findings will be communicated back to the Madrid Assessment Liaison.

3. The program assessment plan should be developed and approved by all faculty in the department. In addition, the program assessment plan should be developed to include student input and external sources (e.g., national standards, advisory boards, employers, alumni, etc.). Describe the process through which your academic unit created this assessment plan. Include the following:
a. Timeline regarding when or how often this plan will be reviewed and revised. (This could be aligned with program review.)

The December 2015 version of the assessment plan is the first such formal plan. It is expected that the assessment plan and procedure will be reviewed annually and revised as necessary.

b. How students were included in the process and/or how student input was gathered and incorporated into the assessment plan.

Students have not been consulted in the drafting of the assessment plan, but their input is included in several different forms as assessment data, most notably in the collection of student course evaluations, the survey of graduating students, and occasional surveys of program alumni.

c. What external sources were consulted in the development of this assessment plan?

The Student Learning Outcomes are specifically chosen to coincide with the *Criteria for Accrediting Computing Programs* as published by the ABET Computing Accreditation Commission (current version effective for the 2015-2016 Accreditation Cycle). Our assessment plan has been developed after examination of such plans at peer institutions who have already undergone ABET accreditation.

d. Assessment of the manageability of the plan in relation to departmental resources and personnel

The adoption of this plan will require non-trivial efforts of the department, although we are committed to in such efforts. There is not currently a designated Assessment Coordinator, but we will consider designating such a role to be considered as a regular contribution to the overall workload of the department.