Suggested Learning Outcomes of the Field of Computer Science

Goal:
- Demonstrate knowledge at the undergraduate level of four core areas in the computer science: systems, AI, PL, and theory. Students should be able to solve problems in these four core areas at the undergraduate level.
- Demonstrate knowledge, understanding, applications, analysis, and evaluation of material at the graduate level in four out of five important core areas of computer science. The five different core areas are as follows: algorithms and theory of computation, artificial intelligence, systems, programming languages and methodology, scientific computing and applications.
- Demonstrate knowledge, understanding, applications, analysis, and evaluation of the three different value systems of the three computer science research styles that differ in how they evaluate and validate research results. The three different research styles are theory, systems, and applications.
- Complete a significant computer science project.

Direct measurements:
- The performance of each student overall in terms of these outcomes is discussed at an annual field meeting, which includes written statements both by the student and her advisor about the students’ performance on the above aspects during the last year. The performance of the student is then discussed by the field. The GFA will keep notes of the discussions at these field meetings.

Indirect measurements:
- Exit survey of students.
- Rating of the PhD students as teaching assistant or course instructors.

Goal:
- Be able analyze, compare, and evaluate the work of other students.

Direct measurement:
- Self-report of the students on their experience to their committee chairs.

Indirect measurement:
- Course evaluation of the student who served as TA or instructor.

Goal:
- Demonstrate readiness to apply the techniques in their research area, to interpret and break down the ideas in existing published research, to reframe and criticize existing work, and to have an in-depth understanding of their own research area.

Direct measurement:
- Passing A-Exam. The performance of each student at the A-Exam is discussed at an annual field meeting. The GFA will keep notes of the discussions at these field meetings.

Indirect measurement:
- Survey of students after graduation.

Goal:
- Demonstrate the ability to do original research, formulate novel research ideas and defend their execution, and assess their own work critically in the light of previous research.

Direct measurement:
- Passing B-Exam and number of publications at the time of B-Exam. The performance of the student in terms of readiness for her B-Exam is discussed at the annual field meeting.
**Indirect measurement:**
- Initial job placement of the candidate, ranking of the department

The data listed above are tracked by the field and the graduate field assistant and compiled for each individual student. The loop is closed in the following ways:
- The chair of each student’s PhD committee monitors each student’s overall progress towards completion of these objectives and provides feedback to the student as needed.
- The chair of each student’s PhD committee provides yearly a short report of all aspects of the students’ performance. This report is reviewed by the field at the annual field meeting.
- Each PhD student provides a yearly written report of all aspects of her performance to the field.
- The director of graduate studies monitors the overall status of the field and suggests adjustment to policies and strategies to be discussed at field meetings.
- The field has an annual meeting to discuss data and identify action items for improvement of student learning and of collection of data. This annual meeting takes place sometime in the early spring semester.