The program educational objectives of the computer science program at Iowa State University are that its graduates demonstrate expertise, engagement, and learning within three to five years after graduation.

1. **Expertise:** Graduated students should have the ability to establish peer-recognized expertise in the discipline. They should have the ability to articulate this expertise by formulating and solving problems of interest, by creating or deriving value through the application of technology, and by using mathematical foundations, algorithmic principles, and computer science theory in designing, implementing, and evaluating computer-based systems and processes which meet the desired needs of their employers.

2. **Engagement:** Graduated students should have the ability to be engaged in the profession through the practice of computer science in industry, academia, or the public sector. They should demonstrate effective teaming and commitment to working with others by applying communications skills and professional knowledge.

3. **Learning:** Graduated students should have the ability to engage in sustained learning through graduate work, professional improvement opportunities, and self study so that they can adapt to the role played by information processing in ever-changing areas of science, technology, and society.

The program educational objectives (PEOs) are published at the following Web pages:

1. Department of Computer Science web page:


2. College of Liberal Arts and Sciences Catalog Web Page:

   [http://catalog.iastate.edu/collegeofliberalartsandsciences/computerscience/](http://catalog.iastate.edu/collegeofliberalartsandsciences/computerscience/)

The manner in which each objective is addressed in the program is summarized below.

1. **Expertise:** This objective is addressed by ensuring that every graduated student must satisfy the requirements of 44 semester hours of computer science. This consists of 23 semester hours of a broad-based core of fundamental computer science courses, and 21 semester hours of advanced course work that provides breadth and builds on the core to provide depth in the discipline.

2. **Engagement:** This objective is addressed by ensuring that every graduated student has the necessary computer science fundamentals which will enable engagement in the computing discipline. We motivate the desire to engage in the computing discipline by providing opportunities for students to participate in broadening activities. Such activities include field trips, seminars, research projects, study abroad, internships, and cooperative study. Students are required to work in teams, give oral presentations and produce written reports in the advanced elective courses in the discipline. In addition, our students are required to take a course that stresses the importance of social and ethical issues of computers in society.
3. **Learning:** This objective is addressed through challenging and open-ended assignments given in many courses, particularly the technical electives, which require students to take an active role in obtaining some knowledge or acquiring some skill that is not explicitly obtained or acquired in class. Many faculty members articulate the need for sustained learning in their classes, encouraging students to attend various departmental opportunities such as technical seminars and colloquia given by faculty or outside speakers from academia and industry. Many students are also engaged in undergraduate research projects supervised by faculty. The benefits of graduate school are communicated early and often, and a concurrent program is available to students whereby undergraduate students with a GPA of 3.0 or higher may take up to 6 credits of graduate course work in their last semester and apply those credits to both their BS and MS degrees.

**Relationship between Program Educational Objectives and Program Outcomes**

The program outcomes are the A-I outcomes identified in Criterion 3 of the ABET Criteria for Computer Science programs and outcomes J and K from the program specific criteria. These outcomes are:

A. An ability to apply knowledge of computing and mathematics appropriate to the discipline.
B. An ability to analyze a problem and identify and define the computing requirements appropriate to its solution.
C. An ability to design, implement, and evaluate a computer-based system, process, component or program to meet desired needs.
D. An ability to function effectively on teams to accomplish a common goal.
E. An ability to understand professional, ethical, legal, security, and social issues and responsibilities.
F. An ability to communicate effectively with a range of audiences.
G. An ability to analyze the local and global impact of computing on individuals, organizations, and society.
H. An ability to engage in continuing professional development.
I. An ability to use current techniques, skills, and tools necessary for computing practices.
J. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems that demonstrate comprehension of the tradeoffs involved in design choices.
K. An ability to apply design and development principles in the construction of software systems of varying complexity.
Table 2-1: Relationship between Program Educational Objectives and Program Outcomes

Table 2-1 is not intended to imply that achievement of program outcomes is a sufficient condition for achievement of program educational objectives. Table 2-1 provides a tool for guiding investigation when data indicates that program educational objectives are not being met. Although each objective contains components of almost every outcome, Table 2-1 only indicates those outcomes for which an objective is perceived to be strongly related.