

## **PROGRAM OBJECTIVES**

**For**

### **COMPUTER SCIENCE UNDERGRADUATE PROGRAM**

#### **Computer Science Program Objectives:**

#### **Our graduates will have achieved:**

1. a broad general education assuring an adequate foundation in science and mathematics relevant to computing.
2. a solid understanding of concepts fundamental to the discipline of computer science.
3. good analytic, design, and implementation skills required to formulate and solve computing problems.
4. the ability to function, communicate, and continue to learn effectively as ethically and socially responsible computer science professionals.

**Objective #1: Our graduates will have achieved a broad general education assuring an adequate foundation in science and mathematics relevant to computing.**

Strategies & Actions	Outcomes	ABET Engr. Criterion 3	Assessment Methods/Metrics	Feedback Method
Core curriculum as required by the University including sequence of courses in English, Social Sciences, Western Traditions, Capstone and Diversity courses.	Students will demonstrate an understanding of diverse perspectives of natural and cultural environments, and the role of the individual as citizen of the nation and world.	A, F, G, H, I, J	Assignments and homework. Exams for individual courses. Student interviews during advisement. Course and instructor evaluations. Evaluation of Senior Project for program.	<b>Review of curriculum and course contents in curriculum committee and general faculty meetings. The curriculum and course contents are reviewed following analysis of the assessment results to determine what, if any changes need to be made as indicated by problems with student performance.</b>
General electives of 15-18 hours which must lead to a minor or include 9 hours upper level coursework in different disciplines. Supplement the core curriculum with upper level discipline oriented courses and/or have an established minor.	Students will acquire a well rounded general education as demonstrated by their ability to integrate CS into other fields.	A, H, I, J	Assignments and homework. Exams for individual courses. Student interviews during advisement. Course and instructor evaluations. Evaluation of Senior Project for program.	<b>Review of curriculum and course contents in curriculum committee and general faculty meetings. The curriculum and course contents are reviewed following analysis of the assessment results to determine what, if any changes need to be made as indicated by problems with student performance.</b>
Have specific courses in science and mathematics to provide strong background in fundamentals. The courses are CHEM 121 or 202; PHYS 180, 180L, 181, 181L; MATH 181, 182, 283, 330, 352.	Students will demonstrate an in-depth understanding of mathematical and scientific principles required in the study of computer science and in solving computing problems.	A, B, K	Assignments and homework. Exams. Student interviews during advisement. Evaluation of Senior Project and other projects in Senior level courses.	Review of curriculum and course contents in curriculum committee and general faculty meetings. The curriculum and course contents are reviewed following analysis of the assessment results to determine what, if any changes need to be made as indicated by problems with student performance.

**Objective # 2: Our graduates will have achieved a solid understanding of concepts fundamental to the discipline of computer science.**

Strategies & Actions	Outcomes	ABET Engr. Criterion 3	Assessment Methods/Metrics	Feedback Method
<p>Introduce problem solving and programming with the use of computers, basic hardware and machine architecture. CS 135, CS 202, CPE 201</p>	<p>At a basic foundation level, students will be able to analyze a problem, develop a programming solution to it, code and execute the program, test, interpret and experiment with results.</p>	<p>A, B, C, E, G</p>	<p>Assignments and homework, closed laboratory experiments and reports, projects. Exams. Select courses administer assessment quizzes in prerequisite subject matter. Presentation and/or demonstration of projects. Course and instructor evaluations.</p>	<p>Review of curriculum and course content in curriculum committee and general faculty meetings and subsequent actions. Professor obtains input on student, course and instruction, takes action and makes recommendations as appropriate. Student interviews and input to project designs.</p>
<p>Build upon the basic foundations with further development and laboratory experiences related to data structures, algorithms, software design and programming languages. CS 302, CS 326, CS 365.</p>	<p>At a higher level, students will demonstrate problem analysis, research design and experimentation, combined with an understanding and appreciation of data structures, advanced programming, algorithms and software engineering.</p>	<p>B, C, D, E, F, G, K</p>	<p>Assignments and homework, closed laboratory experiments and reports, projects. Exams. Select courses administer assessment quizzes in prerequisite subject matter. Presentation and/or demonstration of projects. Course and instructor evaluations.</p>	<p>Review of curriculum and course content in curriculum committee and general faculty meetings and subsequent actions. Professor obtains input on student, course and instruction, takes action and makes recommendations as appropriate. Student interviews and input to project designs.</p>
<p>Provide some advanced content of fundamental concepts in computer science in areas such as operating systems, software engineering, computer organization and theory of computing. CS 425, CS 426, CS 446, CS 456, CPE 301.</p>	<p>Students will develop understanding of hardware and software architectures, operating systems and algorithms. Students will have the capability to design intelligent practical solutions to computing problems and large software systems.</p>	<p>A, B, C, D, G, I, K</p>	<p>Assignments and homework, closed laboratory experiments and reports, projects. Exams. Select courses administer assessment quizzes in prerequisite subject matter. Presentation and/or demonstration of projects. Course and instructor evaluations.</p>	<p>Review of curriculum and course content in curriculum committee and general faculty meetings and subsequent actions. Professor obtains input on student, course and instruction, takes action and makes recommendations as appropriate. Student interviews and input to project designs.</p>

**Objective # 3: Our graduates will have achieved good analytic, design, and implementation skills required to formulate and solve computing problems.**

Strategies & Actions	Outcomes	ABET Engr. Criterion 3	Assessment Methods/Metrics	Feedback Method
<p>Introduce analysis and software design principles through a progression of courses including CS 425, CS 426, CS 446, CS 456, CS 477</p>	<p>Students will be able to analyze a problem and synthesize a likely solution either from scratch or from components put together and derived from other sources. The process of problem solving will improve as a result of developing additional tools.</p>	<p>B, C, D,E,F, G, H, I, K</p>	<p>Assignments and homework. Laboratory projects and reports. Exams. Presentations and demonstrations. Select courses administer assessment quizzes in prerequisite subject matter. Course and instructor evaluations.</p>	<p>Review of curriculum and course content in curriculum committee and general faculty meeting and subsequent actions. Professor obtains input on student, course and instruction, takes action and makes recommendations as appropriate. Student interviews with professor and with peers. Professor recommends individual or general adjustment to course or program of study. Critique by peers and professors.</p>
<p>Provide a good rich selection of technical elective courses through which students are introduced to state of the art technologies and cutting-edge research topics. A sample of courses are CS 415, CS 447, CS 450, CS 457, CS 460, CS 474, CS 479, CS 480, CS 482, CPE 400, CPE 401, CPE 406, CPE 411, CPE 470</p>	<p>Students will demonstrate a knowledge base and awareness of different application areas in computer science. They will demonstrate their ability to research problems and design solutions.</p>	<p>B, C, D, E, F, G, H, I, J, K</p>	<p>Assignments and homework. Laboratory projects and reports. Exams. Presentations and demonstrations. Select courses administer assessment quizzes in prerequisite subject matter. Course and instructor evaluations.</p>	<p>Review of curriculum and course content in curriculum committee and general faculty meetings and subsequent actions. Professor obtains input on student, course and instruction, takes action and makes recommendations as appropriate. Student interviews with professor and with peers. Critique by peers and professors.</p>
<p>With a major capstone course, CS 425, and its companion senior project course, CS 426, as well as, through internship opportunities and research projects in technical elective courses provide practical experiences in fusing and incorporating knowledge acquired throughout the program and curriculum.</p>	<p>Students will integrate knowledge and experience in a real life problem solving situation with a project derived from or inspired by industry. They will demonstrate their ability to work on team projects utilizing good work dynamics.</p>	<p>B, C, D, E, F, G, H, I, J, K</p>	<p>Assignments and homework. Laboratory projects and reports. Exams. Presentations and demonstrations. Select courses administer assessment quizzes in prerequisite subject matter. Internship reports and internship placement evaluations. Course and instructor evaluations.</p>	<p>Review of curriculum and course content in curriculum committee and general faculty meetings and subsequent actions. Professor obtains input on student, course and instruction, takes action and makes recommendations as appropriate. Student interviews with professor and with peers. Critique by peers and professors.</p>

**Objective # 4: Our graduates will have achieved the ability to function, communicate, and continue to learn effectively as ethically and socially responsible computer science professionals.**

Strategies & Actions	Outcomes	ABET Engr. Criterion 3	Assessment Methods/Metrics	Feedback Method
<p>Provide students with knowledge on the effective use of English and develop communication skills. ENG 101, 102, ENGR 301. Also other CS and CPE courses such as CS 311, CS 365, CS 425, CS 426 and others which require project reports and presentations.</p>	<p>Students will demonstrate effective oral and written communication skills including the preparation and delivery of technical topics in computer science.</p>	<p>D, F, G, H, J</p>	<p>Assignment and homework. Project reports and presentations. Software documentations. Professor and peer critique. Course and instructor evaluations.</p>	<p>Student interviews with professors, with peers, and graduation exit interviews recommendation. Professor obtains input on student, course and instruction, takes action and makes recommendations as appropriate. Review of curriculum and course content in curriculum committee and general faculty meetings and subsequent actions.</p>
<p>Have a series of courses that provide the students with knowledge and appreciation of social, environmental and diversity issues. Provide a good understanding of the ethical challenges and social aspects of computing. Courses include all humanities and social sciences and CS 311.</p>	<p>Students will demonstrate awareness of social and ethical problems related to the computer science profession. They will develop tools to analyze ethical as well as technical requirements and design solutions in the context of the world in which they will be used.</p>	<p>F, G, H, I, J</p>	<p>Assignments and homework. Reports and presentations. Exams. Group interactions. Course and instructor evaluations.</p>	<p>Student interviews with professors, with peers, and graduation exit interviews recommendation. Professor obtains input on student, course and instruction, takes action and makes recommendations as appropriate. Review of curriculum and course content in curriculum committee and general faculty meetings and subsequent actions.</p>
<p>Upper level courses and technical electives involve students in real world projects, technical readings, and research procedures. This will provide a context in which students can learn and practice state of the art computing practices while demonstrating the need for life-long learning and the rewards of research.</p>	<p>Graduates that are gainfully employed as computer science professionals and graduates who pursue advanced degrees, and are capable of lifelong learning.</p>	<p>F, G, H, I, J, K</p>	<p>Assignments and homework. Reports and presentations. Exams. Group interactions. Alumni surveys. Employer input. Advisory Board interviews and recommendations. Placement of students as employees, interns or graduate students. Course and instructor evaluations.</p>	<p>Student interviews with professors, with peers, and graduation exit interviews recommendation. Professor obtains input on student, course and instruction, takes action and makes recommendations as appropriate. Review of curriculum and course content in curriculum committee and general faculty meetings and subsequent actions.</p>