



# UNIVERSITY of WISCONSIN - EAU CLAIRE

Department of Computer Science • 130 Phillips Science Hall • (715) 836-2526

## Program Mission

The mission of the undergraduate programs in the Department of Computer Science is to provide a high-quality and broad-based education that prepares graduates for successful professional careers and a lifetime of learning. The constituencies of these programs are our students, faculty, alumni, and employers of our students. To this end, the Department of Computer Science should:

- Offer up-to-date curricular program(s) of study of the discipline of computer science for undergraduate, liberal arts students wishing a major or minor concentration in this field in preparation for further education beyond the undergraduate level or for employment as a computer science professional.
- Provide curriculum meeting the current needs of the general university students for which computing tools, skills, and knowledge are important for supporting their investigations in fields other than computer science.
- Provide curriculum as an outreach to individuals whose vocation would be enhanced through additional knowledge and application of the tools of computer science.
- Foster professional growth of the department's faculty and staff with regard to both the computer science discipline and the computing industry.
- Provide faculty, staff, and students with access to "state of the art" computer hardware and software technologies appropriate for the academic environment of the department.
- Provide an academic environment that fosters excellence in teaching and learning, scholarship, and academic advising support for the diverse needs of students.
- Provide consultant support on computer technologies for faculty, staff, and students on our campus as well as individuals and organizations outside of our academic community.

The programs must prepare individuals to understand and grow with the changing nature of the computer science discipline, to meet the challenges of continuing education and to meet the expectations of the work place. The program should fulfill this mission in the context of a liberal arts education as opposed to a technical program. The liberal arts nature of the program implies that the program must contain, investigate, and disseminate information and knowledge regarding the most current concepts of the computer science discipline. Emphasis should also be placed on preparing communicative, investigative, and inquisitive minds capable of coping with the dynamic changes that continue to be expected in the computer science discipline.

The program should provide a breadth of knowledge across the topical areas, currently recognized as defining the computer science discipline, to all students in the program. It should also provide a depth of knowledge in selected topical areas.

## General Program Principles

Consistent with this mission and the needs of our constituencies, the Department of Computer Science at UW – Eau Claire has the following general principles for its programs:

- The program should provide a substantial "core" of courses that cover those concepts required for all computer science graduates. Core concepts are those that every individual in the job market or involved in a post-graduate program would be expected to know. These include: software design, problem solving techniques and algorithms, data structures, computer organization, database systems, operating systems, computer

networks, programming languages, and software engineering. It is expected that this set of concepts should remain relatively stable during the life of the program.

- The program should provide a small number of advanced elective courses that discuss individual topical areas in greater depth. These advanced electives should reflect the changing nature of the computer science discipline and the expertise of the department faculty.
- The program should promote the liberal arts setting of the thinking, abstraction, and transference process so as to permit individuals to continue the life-long learning process.
- The program should maintain a well-defined scope for topics within the curricular offerings and provide for the continuity of topics and instructional environments from one course to another.

## **Specific Program Objectives**

Consistent with the mission and the needs of our constituencies, the Department of Computer Science at UW – Eau Claire has the following objectives for all graduates:

1. Graduates will have demonstrated a thorough grounding in the fundamental principles and practices of computer science.
2. Graduates will possess and convey a professional attitude appropriate for a diverse world community.
3. Graduates will have demonstrated a pattern of effective oral and written communication on technical topics.
4. Graduates will have undertaken complex problems and developed appropriate technical solutions.
5. Graduates will have demonstrated appropriate professional attitudes and ethics.
6. Graduates will have applied their knowledge and skills in the development of practical systems to meet customer requirements.
7. Graduates will have progressed from entry-level positions to positions that involve specification, analysis, design, and/or testing of practical computer applications.
8. Graduates will have demonstrated a pattern of effective teamwork and leadership skills within a technical project setting.

## **Specific Program Outcomes**

The Department of Computer Science at UW – Eau Claire has the following expected outcomes for all graduating seniors:

- A. Seniors will be proficient in OO programming and design, algorithms, and data structures.
- B. Seniors will be proficient in the principles and practices of software engineering.
- C. Seniors will have an understanding of modern database systems.
- D. Seniors will have an understanding of computer organization and architecture.
- E. Seniors will have an understanding of operating systems and distributed computation.
- F. Seniors will have an understanding of the fundamental principles of programming languages.
- G. Seniors will have an understanding of fundamental computer networking principles.
- H. Seniors will have experience using industry standard database systems.
- I. Seniors will have experience with a mixture of industry standard software development tools and environments.
- J. Seniors will have experience working in teams on group projects.
- K. Seniors will have the ability to write and speak effectively on a technical subject in CS.
- L. Seniors will have an understanding of professional and ethical responsibilities.

## Mapping of Outcomes to Objectives

Objective	Student Outcomes
1. Graduates will have demonstrated a thorough grounding in the fundamental principles and practices of computer science.	A. Seniors will be proficient in OO programming and design, algorithms, and data structures. B. Seniors will be proficient in the principles and practices of software engineering. C. Seniors will have an understanding of modern database systems. D. Seniors will have an understanding of computer organization and architecture. E. Seniors will have an understanding of operating systems and distributed computation. F. Seniors will have an understanding of the fundamental principles of programming languages. G. Seniors will have an understanding of fundamental computer networking principles.
2. Graduates will possess and convey a professional attitude appropriate for a diverse world community.	J. Seniors will have experience working in teams on group projects. K. Seniors will have the ability to write and speak effectively on a technical subject in CS. L. Seniors will have an understanding of professional and ethical responsibilities.
3. Graduates will have demonstrated a pattern of effective oral and written communication on technical topics.	J. Seniors will have experience working in teams on group projects. K. Seniors will have the ability to write and speak effectively on a technical subject in CS.
4. Graduates will have undertaken complex problems and developed appropriate technical solutions	B. Seniors will be proficient in the principles and practices of software engineering E. Seniors will have an understanding of operating systems and distributed computation H. Seniors will have experience using industry standard database systems J. Seniors will have experience working in teams on group projects
5. Graduates will have demonstrated appropriate professional attitudes and ethics.	J. Seniors will have experience working in teams on group projects. K. Seniors will have the ability to write and speak effectively on a technical subject in CS. L. Seniors will have an understanding of professional and ethical responsibilities.
6. Graduates will have applied their knowledge and skills in the development of practical systems to meet customer requirements	B. Seniors will be proficient in the principles and practices of software engineering
7. Graduates will have progressed from entry-level positions to positions that involve specification, analysis, design, and/or testing of practical computer applications.	B. Seniors will be proficient in the principles and practices of software engineering I. Seniors will have experience with a mixture of industry standard software development tools and environments J. Seniors will have experience working in teams on group projects. K. Seniors will have the ability to write and speak effectively on a technical subject in CS. L. Seniors will have an understanding of professional and ethical responsibilities
8. Graduates will have demonstrated a pattern of effective teamwork and leadership skills within a technical project setting.	B. Seniors will be proficient in the principles and practices of software engineering J. Seniors will have experience working in teams on group projects. K. Seniors will have the ability to write and speak effectively on a technical subject in CS. L. Seniors will have an understanding of professional and ethical responsibilities

## Mapping of Courses to Outcomes

Outcome	Courses
A. Seniors will be proficient in OO programming and design, algorithms, and data structures.	CS 145 – Fund. Object-Oriented Programming CS 245 – Advanced Programming & Data Structures CS 255 – Algorithms & Discrete Structures CS 355 – Software Engineering I CS 485 – Software Engineering II
B. Seniors will be proficient in the principles and practices of software engineering.	CS 268 – Web-Centric Programming CS 355 – Software Engineering I CS 396 – Junior Seminar CS 485 – Software Engineering II
C. Seniors will have an understanding of modern database systems.	CS 146 – The Big Picture in Computer Science CS 345 – Database Systems
D. Seniors will have an understanding of computer organization and architecture.	CS 278 – Digital System Design CS 352 – Computer Organization and Design
E. Seniors will have an understanding of operating systems and distributed computation.	CS 352 – Computer Organization and Design CS 362 – Op. Systems & Distrib. Systems CS 388 – UNIX Systems Programming CS 462 – Computer Networks
F. Seniors will have an understanding of the fundamental principles of programming languages.	CS 145 – Fund. Object-Oriented Programming CS 245 – Advanced Programming & Data Structures CS 255 – Algorithms & Discrete Structures CS 268 – Web-Centric Programming CS 330 – Theory of Programming Languages CS 420 – Artificial Intelligence
G. Seniors will have an understanding of fundamental computer networking principles.	CS 370 – Computer Security CS 462 – Computer Networks
H. Seniors will have experience using industry standard database systems.	CS 345 – Database Systems
I. Seniors will have experience with a mixture of industry standard software development tools and environments.	CS 145 – Fund. Object-Oriented Programming CS 245 – Advanced Programming & Data Structures CS 255 – Algorithms & Discrete Structures CS 330 – Theory of Programming Languages CS 345 – Database Systems CS 355 – Software Engineering I CS 485 – Software Engineering II
J. Seniors will have experience working in teams on group projects.	CS 345 – Database Systems CS 355 – Software Engineering I CS 462 – Computer Networks CS 485 – Software Engineering II
K. Seniors will have the ability to write and speak effectively on a technical subject in CS.	CS 330 – Theory of Programming Languages CS 345 – Database Systems CS 352 – Computer Organization and Design CS 355 – Software Engineering I CS 362 – Op. Systems & Distrib. Systems

	CS 462 – Computer Networks CS 485 – Software Engineering II
L. Seniors will have an understanding of professional and ethical responsibilities.	CS 146 – The Big Picture in Computer Science CS 345 – Database Systems CS 370 – Computer Security PHIL 308 – Ethics in Computing and Engr.

## Student Outcomes and Their Measures

- A. *Seniors will be proficient in OO programming and design, algorithms, and data structures.*  
Metrics: Senior Exit Surveys; Instructor Feedback; Course Surveys; IAC Feedback; ETS Major Field Test; Embedded Course Assessment.
- B. *Seniors will be proficient in the principles and practices of software engineering.*  
Metrics: Senior Exit Surveys; Instructor Feedback; Course Surveys; IAC Feedback; ETS Major Field Test; Embedded Course Assessment.
- C. *Seniors will have an understanding of modern database systems.*  
Metrics: Senior Exit Surveys; Instructor Feedback; Course Surveys; IAC Feedback; ETS Major Field Test; Embedded Course Assessment.
- D. *Seniors will have an understanding of computer organization and architecture.*  
Metrics: Senior Exit Surveys; Instructor Feedback; Course Surveys; IAC Feedback; ETS Major Field Test; Embedded Course Assessment.
- E. *Seniors will have an understanding of operating systems and distributed computation.*  
Metrics: Senior Exit Surveys; Instructor Feedback; Course Surveys; IAC Feedback; ETS Major Field Test; Embedded Course Assessment.
- F. *Seniors will have an understanding of the fundamental principles of programming languages.*  
Metrics: Senior Exit Surveys; Instructor Feedback; Course Surveys; IAC Feedback; ETS Major Field Test; Embedded Course Assessment.
- G. *Seniors will have an understanding of fundamental computer networking principles.*  
Metrics: Senior Exit Surveys; Instructor Feedback; Course Surveys; IAC Feedback; ETS Major Field Test; Embedded Course Assessment.
- H. *Seniors will have experience using industry standard database systems.*  
Metrics: Senior Exit Surveys; Course Surveys; IAC Feedback.
- I. *Seniors will have experience with a mixture of industry standard software development tools and environments.*  
Metrics: Senior Exit Surveys; Course Surveys; IAC Feedback.
- J. *Seniors will have experience working in teams on group projects.*  
Metrics: Senior Exit Surveys; Instructor Feedback; Course Surveys; IAC Feedback.
- K. *Seniors will have the ability to write and speak effectively on a technical subject in CS.*  
Metrics: Senior Exit Surveys; Instructor Feedback; Course Surveys; IAC Feedback.
- L. *Seniors will have an understanding of professional and ethical responsibilities.*  
Metrics: Senior Exit Surveys; Instructor Feedback; Course Surveys; IAC Feedback; Embedded Course Assessment.

## **Assessment Process**

The Department Chair will oversee the assessment process. Assessment materials will be collected according to the following schedule: Senior Exit Survey (each semester), Course Survey (each semester), Instructor Feedback (each semester), IAC Feedback (annually), ETS Major Field Test (annually). The Department Chair will evaluate these materials in consultation with the faculty of the Department as necessary and appropriate. The Department Chair will document any areas of concern via the Assessment Form and will discuss the concern with the faculty of the Department. The Department Chair will maintain an Assessment Form for each concern for which a corresponding correction is made in the curriculum. The Department Chair will share relevant concerns with the Industrial Advisory Council (IAC) during its annual meeting. Additionally, the Industrial Advisory Council and the faculty of the Department will review the educational objectives for the program at least every five years. This process is designed to ensure that:

- program objectives are defined/redefined and periodically evaluated,
- program/student outcomes are continuously monitored, and
- results of assessment are applied to continuously develop and improve the programs.

Last Revised – 9/6/2009