2025-26
Computer Science
GUIDEBOOK

CHANGING LIVES.
CHANGING THE WORLD.

UE University
of Evansville

2025-26
Computer Science
PROGRAM GUIDEBOOK

Table of Contents

Webpage
evansville.edu/ComputerScience

Revised 2025

Program Overview and Objectives

Computer science is an emerging, in-demand field across all industries. A Bachelor of Science in Computer Science provides extensive knowledge in programming, software development, and cybersecurity, allowing opportunities for specialization. Applying the knowledge and problem-solving skills of computer science creates new developments in the world. It's what pushes our technology to levels we didn't know existed. As this becomes increasingly part of our daily lives, computer scientists will be presented with career opportunities, new challenges, and continual learning.

In accordance with ABET accreditation criteria, the faculty has established program educational objectives and outcomes for students majoring in Computer Science at the University of Evansville. The purpose of these is to ensure that graduates of the program are adequately prepared to enter the workforce fully prepared as computer science professionals. Recognizing that performance of students and graduates is an important consideration in the evaluation of an institution, a system of ongoing assessment is conducted by faculty to continuously improve the effectiveness of the program.

Educational Objectives and Student Outcomes

Graduates are defined as Computer Science alumni within three to five years of graduation.

"Students" are defined as Computer Science students at the time of graduation from the University of Evansville.

Objective 1: *Graduates will be engaged in a professional career and continuing education, or advanced study in their chosen field. This implies that graduates will recognize the value and necessity of lifelong learning.*

- **Outcome 1a.** Students will have an ability to apply computer science theory and software development fundamentals to produce computing-based solutions. (ABET CAC outcome 6)

- **Outcome 1b.** Students will have an ability analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions. (ABET CAC outcome 1)

Objective 2: Graduates will be engaged in applications of problem solving and communication skills for a wide variety of problems in engineering or computer science, either as individuals or in teams.

- **Outcome 2a.** Students will have an ability to function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline. (ABET CAC outcome 5)

- **Outcome 2b.** Students will have an ability to design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline. (ABET CAC outcome 2)
- **Outcome 2c.** Students will have an ability to communicate effectively in a variety of professional contexts. (ABET CAC outcome 3)

Objective 3: *Graduates will be active participants in a local, national, or global engineering or computer science community.*

- **Outcome 3a.** Students will have an ability to recognize professional responsibilities and make informed judgments, in computing practice based on legal and ethical principles. (ABET CAC outcome 4).

In addition to strong technical skills, today's computer science professionals in the global marketplace must be adept at working with other people who have very different professional backgrounds and who may be from other countries with different cultures. The University of Evansville is helping students meet that challenge by providing them with a strong liberal arts background and providing an opportunity for an international experience at Harlaxton, our study abroad center in England.

The Computer Science program at UE provides a firm foundation in mathematics, natural science, and basic programming analysis and design, along with humanities. Students apply their knowledge to various projects during the second half of the program. During this time, students will not only work with teams of students but also one-on-one with highly qualified professors. They will focus on the design and implementation of computer software systems as well as the scientific and industrial applications of computer science.

The Computer Science curriculum is typical of most CAC-ABET accredited colleges and universities.

What differentiates UE's program from larger university programs is the following:

- Students have the opportunity to study abroad at Harlaxton in England and still complete their Computer Science degree in eight semesters.
- Class sizes are small, allowing close personal contact between students and professors and for design project opportunities.
- The faculty is dedicated to teaching, which gives the program great flexibility. Course content is kept up-to-date, and innovative instruction techniques, such as interdisciplinary team projects, cooperative learning, and concurrent engineering are used in the classroom.
- Emphasis is placed on preparing students to enter the practice of Computer Science upon graduation.

- A personalized co-op program, featuring alternating terms of paid, full-time professional employment and University attendance, is available.
- The University's size and diversity facilitates the ability of Computer Science students to interact with students and faculty in other programs, thus allowing intellectual and social interchange.
- Students are mentored to develop a love of learning and discovery that will motivate them to be lifelong learners.

Areas of Specialization

The computer science industry is rapidly changing. Computer science professionals fall under a broad umbrella of specialties. UE offers Computer Science majors the opportunity to focus their learning to compete in the expanding market.

The Bachelor of Science in Computer Science requires at least 125 hours of coursework distributed as follows:

Enduring Foundations General Education (41 hours)

Including FYS 112*, Mathematics 105, Computer Science 495, and the foreign language proficiency requirement

Basic Level Courses (12 hours)
Computer Science 101, 210, 215, 220
Computer Science Concentration Courses (27 hours)
Computer Science 320, 380, 381, 390, 470, 315, 495*†, 497*;
Mathematics 370

Concentration Track Courses (27 hours)
Classic Computer Science Track: Mathematics 221, 222, 223; Engineering 390 OR Mathematics 365 OR Mathematics 341; Technical Electives (12 hours from list below)

Applied Computer Science Track: Mathematics 134; Quantitative Management 227; Computer Science 440, 475; Technical Electives (15 hours from list below, **excluding CS440, 475**)

Technical Electives:

Computer Science 350, 355, 375, 376, 391, 395, 413, 415, 430, 440, 455, 472, 473, 475, 478, 491, 499

Electrical Engineering 354, 454, 456

Logistics and Supply Chain Management 315

Electives (18 hours)

One of the available Certificate options or other electives:

Business Essentials Certificate:

Economics 102, Accounting 210, Management 377, Marketing 325, plus 6 hours of other electives

Logistics Essentials Certificate:

Logistics and Supply Chain Management 315, three additional 300/400-level Logistics and Supply Chain Management Courses of your choice, plus 6 hours of other electives

*Meets Writing Across the Curriculum requirement (overlay E).
†Meets Enduring Foundations capstone requirement (outcome 11).

Undergraduate Research

There are numerous opportunities to conduct undergraduate research. All students are encouraged to participate in at least one undergraduate research project at some point in their four years at UE. Students who have an interest in graduate school are strongly encouraged to participate in multiple programs. Some of the undergraduate research opportunities available to students studying computer science are described below.

NSF Sponsored Research Experience for Undergraduates (REU)

This program is sponsored by the National Science Foundation. It allows undergraduates to participate in research projects at major research institutions across the country. Participating students typically have a B+ or better grade point average and have achieved junior status. Most REUs provide a stipend (about $2,000 to $3,000 for 10 weeks) and some provide a housing or moving allowance. All REUs take place during the summer. For more information visit nsf.gov/crssprgm/reu/index.jsp.

UE Sponsored Undergraduate Research

The University of Evansville also sponsors summer research projects which typically provide a housing allowance or a stipend. Almost all academic areas participate in these projects which are awarded to students on a competitive basis. All result in a student publication or presentation at a national or regional conference.

Special Topics and Independent Study

Many professors are willing to sponsor research projects during the school year. Students typically register for Electrical Engineering 498 or Computer Science 498 and receive 1-3 hours of credit for such study.

National Competition Projects

The Computer Science and other Engineering majors participate in several regional and national competitions, and all students (including freshmen) are eligible to participate in these projects. The southeast region of the Institute of Electrical and Electronics Engineers sponsors a robot competition each year. This is a team project and is usually completed as part of the senior design. Trinity University in Connecticut sponsors a national firefighting robot competition in which a robot must find its way through a maze, locate a candle, and extinguish it.

More recently, the department has begun competing in a robotic football competition that takes place at the University of Notre Dame.

Co-op and Intern Program

Computer Science majors are encouraged to participate in cooperative education (co-op program) or internships during their time at UE. In the co-op program, a student completes the Bachelor of Science in Computer Science degree requirements in five years but at the end of that time, the student has a Bachelor of Science in Computer Science plus up to four terms of industrial experience.

Internships are available to students who would like to gain computer science work experience without a long-term commitment. Internships are available as full-time jobs during the summer or as part-time jobs during the school year.

Co-op and intern students normally get a higher salary offer upon graduation than their peers. In many cases the co-op employer provides a long-term employment opportunity for the co-op student upon graduation.

The real value of the co-op program is in the experience that it provides the student. A co-op job can be a financial benefit, but net income from one term at work does not typically cover the cost of one term of education. These programs give employers an opportunity to look at a student as a prospective employee without making a commitment to long term employment. Likewise, these programs give the student a chance to look at a company and gain some experience before entering the workforce as a working professional.

The typical Computer Science co-op student schedule is shown below. The student attends classes the first two years. At the end of the sophomore year the student begins summer work with a private company or government agency. The student returns to school in the fall, then works spring semester. Thereafter, the student alternates between work and school. Other plans are possible, including concurrent co-ops where students take courses part-time while working.

CO-OP CALENDAR			
Year	Fall	Spring	Summer
1	School 1	School 2	Work option
2	School 3	School 4	Work 1
3	School 5	Work 2	School/Work option
4	Work 3	School 6	Work 4
5	School 7	School 8	

Students who are exceptionally well prepared to enter the workforce may begin their co-op period in the summer after the freshman year. This is unusual, and most students begin after the sophomore year.

To enter the co-op program, students should enroll in Experiential Education 90 (EXED 090). This course covers such topics as résumé writing, interviewing, and what is expected on the job. The Center for Career Development takes care of contacting employers and arranging interviews for students. Actual placement in a co-op or intern position is dependent on the outcome of the interview process.

Employers located in the immediate Evansville area, in the surrounding region of Indiana, Kentucky, and Illinois, and at various places throughout the country employ UE Computer Science students in the co-op and intern programs.

The companies listed below are some of the companies that have employed UE Computer Science students in the past.

Alcoa	Intel Corporation	CenterPoint Energy
Boeing	NSWC Crane	Whirlpool Corporation
General Electric	Toyota	Wright-Patterson AFB

Harlaxton Option

Harlaxton is the University of Evansville's study abroad center located in the rolling countryside of Grantham, England. Harlaxton is about a one-hour ride by train from London. Computer Science students who choose to spend a semester studying at Harlaxton have easy access to England's culture, history, and entertainment.

Harlaxton is housed in a large Victorian manor where about 200 students and faculty members live and hold classes. The Manor has a number of historic state rooms, a soccer field, sports hall, student lounges, bistro, and walking trails.

Computer Science students who wish to study one semester in England are encouraged to do so during the first semester of their sophomore year. At Harlaxton, Computer Science students typically take British Studies and general education classes. Harlaxton is on the semester system and all courses earn credit the same way they would if they were taken in Evansville. Since the Computer Science program requires a number of general education classes, all classes taken at Harlaxton can count as required courses toward the Computer Science degree. Tuition at Harlaxton is the same as tuition at UE and all scholarships and loans may be applied to Harlaxton costs.

Students at Harlaxton are encouraged to travel on weekends. The college arranges eight to 10 weekend field trips to locations such as Nottingham, London, and Scotland, and Wales. During some semesters, less frequent but longer trips are arranged to Ireland and the continent.

Harlaxton has its own resident British faculty as well as visiting faculty from the University of Evansville and other selected campuses in the United States. Likewise, students at Harlaxton come from the Evansville campus and various other campuses around the United States.

Harlaxton Costs

While the tuition at Harlaxton is the same as tuition at UE and all scholarships apply to Harlaxton, there are additional costs associated with travel. The typical airplane round trip is $1,500 and the typical student at Harlaxton will spend an additional $3,000-$4,000 on weekend trips, souvenirs, and other miscellaneous expenses.

Honors Program

The Honors Program is open to selected students. Typically students apply when admitted to the University, but they may also may apply during the first year of study. Admittance to the Honors Program is determined by the University Honors Committee on the basis of standardized test scores, high school grade point average, extracurricular activities, and an essay. The Honors Program provides participants with the opportunity to interact with other Honors Program students both socially and academically. Special Honors courses and other academic events are available for Honors students. Honors students are able to register early, live in the Honors residence hall, and receive a University Honors designation on their official transcript.

To successfully complete the Honors Program, a student must fulfill the following requirements.

- Achieve a GPA of 3.5 or above by the time of graduation
- Complete 15 credit hours of Honors courses
- Complete an Honors project
- Earn four Honors participation points per semester

Honors courses are designated as such by the Registrar. In addition, a limited number of courses may be contracted formally as honors courses, generally requiring additional or alternative coursework. A sufficiently complex Computer Science senior project can be approved as an Honors project. Often these projects are more research-oriented than the typical senior project.

Honors participation points are earned by attending Honors Program activities. Each semester a major event is held that is worth three Honors participation points. Currently the fall event is a formal banquet and the spring event is a Nerd Wars trivia night. In addition, six to eight smaller events are organized that are worth one Honors participation point each. These events include group attendance at athletic events, theatre, and music performances, other academic or social events, and Honors Project presentations. Students studying at Harlaxton or other study abroad programs are granted the four Honors participation points for that semester automatically in recognition of the study abroad experience.

Honors Activities (points vary)
Students may receive Honors Program points for activities other than traditional coursework. These might include a summer research experience for undergraduates (REU) program, an internal research project, a paper or poster presentation, a summer internship, completion of the co-op program, participation in an IEEE or ACM sponsored contest, participation in community projects, or a leadership role in a student professional organization.

Bachelor of Science in Computer Science– CLASSIC TRACK

FALL			SPRING		
FRESHMAN					
GEN ED	Outcome 8 /w Lab	4	CS 210	Fund of Prog I	3
CS 101	Intro to Comp Science	3	MATH 222	Calculus II	4
FYS 112	First Year Seminar	3	GEN ED	Outcome 8	3
MATH 221	Calculus I	4		General Education	3
	Foreign Lang 111*	3		Foreign Lang 112*	3
		17			16
SOPHOMORE					
CS 215	Fundamentals of Programming II	3	CS 220	Logic Design	3
			CS 315	Algorithms & Data Structures	3
MATH 323	Calculus III	4			
MATH 365	Probability	3	MATH 370	Discrete Math	3
MATH 341	Linear Algebra			General Education	3
	General Education	3		Free Elective	3
	Free Elective	3			15
		16			
JUNIOR					
CS 380	Programming Languages	3	CS 320	Computer Architecture	3
CS 390	Software Engineering	3		Computer Science Elective	3
	Technical Elective	3		Technical Elective	3
	General Education	3		General Education	3
	Free Elective	3		Free Elective	3
		15			15
SENIOR					
CS 381	Formal Languages	3	CS 470	Operating Systems	3
CS 495	Senior Project I	3	CS 497	Senior Project II	3
	Technical Elective	3		Technical Elective	3
	General Education	3		Free Elective	3
	General Education	1			12
	Free Elective	3			
		16			

*Note: Only if necessary to meet the University foreign language requirement.

Bachelor of Science in Computer Science– APPLIED TRACK

FALL			SPRING		
FRESHMAN					
GEN ED	Outcome 8 /w Lab	4	CS 210	Fund of Prog I	3
CS 101	Intro to Comp Science	3	QM 227	Intro to Statistics	3
FYS 112	First Year Seminar	3	GEN ED	Outcome 8	3
MATH 134	Survey of Calculus	3		General Education	3
	Foreign Lang 111*	3		Foreign Lang 112*	3
		16			15
SOPHOMORE					
CS 215	Fundamentals of	3	CS 220	Logic Design	3
	Programming II		CS 315	Algorithms & Data	3
MATH 370	Discrete Math	3		Structures	
	General Education	3		General Education	3
	Free Elective	3		General Education	3
	Free Elective	3		Free Elective	3
		15			15
JUNIOR					
CS 380	Programming Languages	3	CS 320	Computer Architecture	3
CS 390	Software Engineering	3	CS 440	Databases	3
	Technical Elective	3		Technical Elective	3
	General Education	3		Technical Elective	3
	Free Elective	3		Free Elective	3
		15			15
SENIOR					
CS 381	Formal Languages	3	CS 470	Operating Systems	3
CS 475	Networks	3	CS 497	Senior Project II	3
CS 495	Senior Project I	3		Technical Elective	3
	Technical Elective	3		Technical Elective	3
	General Education	3		General Education	1
		15		Free Elective	3
					16

*Note: Only if necessary to meet the University foreign language requirement.

Harlaxton Option
Bachelor of Science in Computer Science

FALL			SPRING		

FRESHMAN

	FALL			SPRING	
GEN ED	Outcome 8	3/4	CS 210	Fund of Prog I	3
CS 101	Intro to Comp Science	3	CONC	Applied/Classic**	3/4
FYS 112	First Year Seminar	3	GEN ED	Outcome 8	3/4
CONC	Applied/Classic**	3/4		General Education	3
	Foreign Lang 111*	3		Foreign Lang 112*	3
		15/17			15/17

SOPHOMORE

	FALL			SPRING	
ID H282	British Studies I	3	CS 220	Logic Design	3
ID H283	British Studies II	3	CS 315	Algorithms & Data Structures	3
	General Education	3	MATH 370	Discrete Math	3
	General Education	3		General Education	3
	Free Elective	3		Free Elective	3
		15/16			15

JUNIOR

	FALL			SPRING	
CS 380	Programming Languages	3	CS 320	Computer Architecture	3
CS 390	Software Engineering	3		Computer Science Elective	3
	Technical Elective	3		Technical Elective	3
	General Education	3		General Education	3
	Free Elective	3		Free Elective	3
		15			15

SENIOR

	FALL			SPRING	
CS 381	Formal Languages	3	CS 470	Operating Systems	3
CS 495	Senior Project I	3	CS 497	Senior Project II	3
	Technical Elective	3	CONC	Applied/Classic**	3
	General Education	3		Technical Elective	3
	General Education	1		Free Elective	3
	Free Elective	3			15
		16			

*Note: Only if necessary to meet the University foreign language requirement.

**CONC: Concentration Tracks, Applied Computer Science/Classic Computer.

Computer Science Course List

For course descriptions, visit evansville.edu/ComputerScience and select About Our Program > Course Offerings.

CS 101 Introduction to Computer Science

CS 210 Fundamentals of Programming I

CS 215 Fundamentals of Programming II

CS 220 Logic Design and Machine Organization

CS 290 Object-Oriented Design

CS 310 Puzzle Programming

CS 315 Algorithms and Data Structures

CS 320 Computer Architecture

CS 350 Computer/Human Interaction

CS 355 Computer Graphics

CS 375 UNIX System Programming

CS 376 Small Computer Software

CS 380 Programming Languages

CS 381 Formal Languages

CS 390 Software Engineering

CS 391 Software Engineering II

CS 395 Software Project Management

CS 413 Software Security

CS 415 Cryptography

CS 430 Artificial Intelligence

CS 440 Databases

CS 445 Programming in the Large

CS 455 Advanced Computer Graphics

CS 470 Operating Systems

CS 472 Concurrent and Parallel Programming

CS 473 Mobile Application Development

CS 475 Networks

CS 478 Embedded Systems and Real-Time Programming

CS 491 Software Quality Assurance

CS 494 Senior Project Seminar

CS 495 Senior Project Phase I

CS 497 Senior Project Phase II

CS 498 Independent Study in Computer Science

CS 499 Special Topics in Computer Science

Faculty and Staff

Name	Office	Telephone/Email
Maxwell Omwenga, PhD Assistant Professor of Computer Science Program Director, Computer Science	KC 252	812-488-2691 mo138@evansville.edu
Bruce Mabis, PhD Clinical Assistant Professor of Computer Science	KC 259	812-488-2667 bm339@evansville.edu
Ying Ying Seah, PhD Assistant Professor of Computer Science	KC 258	812-488-2330 ys55@evansville.edu
Chrissy Larcomb Administrative Assistant	KC 250	812-488-2652 ch47@evansville.edu
Ray Shelton Lab Manager	KC 190	812-488-2292 rs249@evansville.edu

Other Contacts

Jared Fulcher, PhD
Associate Dean,
  School of Engineering
  and Computer Science
	KC 250A	812-488-2767
		jf201@evansville.edu

Notes

University of Evansville

1800 Lincoln Avenue
Evansville, Indiana 47722
evansville.edu