Computing Sciences

2021-2022

B.S., M.S.
CS, AC, IT, SE

ABET, ACM, IEEE, UPE

The Department of Computing Sciences at the University of Scranton offers three undergraduate majors, preparing students for professional careers and for advanced study. The emphasis is on mastering the foundational concepts of computing while making use of state-of-the-art tools. We recently celebrated the “50 Year Anniversary” of our first program and have over 1,200 alumni from our programs.

The Bachelor of Science Degree (B.S.) in Computer Science (CS) was first offered in 1970, making it one of the oldest and most established programs in the state of Pennsylvania, and second oldest among the Jesuit schools.

The Bachelor of Science Degree (B.S.) in Applied Computing (AC), formerly known as Computer Information Systems, was established in 1985 and recently renamed and broadened to better serve the needs of those students more interested in the application of computing. Students pair a strong technical preparation with another discipline of their choice, often through a minor, concentration or double-major.

The Bachelor of Science Degree (B.S.) in Information Technology (IT) enrolled its first students in Fall 2016 and prepares students to be “user-focused” professionals who apply technology to meet the needs of organizations.

Additionally, since 1990 the department has offered a Master of Science (M.S.) degree program in Software Engineering (SE). This program attracts experienced software developers as well as students coming directly out of undergraduate programs. A Combined Baccalaureate/ Master’s Degree Program provides a means for qualified undergraduate students to earn both B.S and M.S. degrees in five years.

Undergraduate Curricula

The Computer Science, Applied Computing and Information Technology programs share a common core of introductory courses during the first year of study. These courses prepare students in the underlying foundational concepts and skills of the computing discipline. All three programs require a series of 0.5 credit Colloquia courses and culminate during the senior year in a capstone course, when students undertake a project in collaboration with a faculty advisor. In addition to developing the artifacts of the project, students must also satisfy significant reporting requirements as a means of honing their communication skills. Students are further encouraged to pursue internship and undergraduate research opportunities.

The Computer Science major is accredited by ABET (http://www.abet.org), the recognized accrediting body for college and university programs in applied science, computing, engineering and technology. It is one of just twenty such accredited schools the state of Pennsylvania and has been continuously accredited since 1990.

Related Programs

The undergraduate program in Computer Engineering (CE), offered through the department of Physics/EIE, requires 27 credits of coursework in our department.

Proficiencies

Students gain experience utilizing a variety of languages (including Java, Python, C/C++, PHP, LISP and assembler) and systems (including MS Windows, OS X, UNIX, Linux, FreeBSD and LeOS). Students have the opportunity to explore the application of TCP/IP, Web servers (including Apache and Tomcat), database management systems (including MySQL and PostgreSQL), J2EE, Java Servlets and various wireless technologies. Projects involving software development for mobile devices have utilized both the Android and Apple iOS platforms. This variety provides valuable and marketable expertise to augment the theory and conceptual understanding emphasized in coursework.

Facilities

In addition to the general computing resources available to all University students, the Department of Computing Sciences provides a variety of computing resources dedicated to the support of programs in computing. Laboratories on the first floor of the Loyola Science Center, near faculty offices, provide reconfigurable space for these resources, most of which are accessible from both on and off campus locations through a VPN. The department is a member of the MSDN® Academic Alliance (MSDNAA), which offers a wide range of Microsoft software development tools (including Visual Studio .NET).

Graduates

Graduates of our programs experience great success in securing professional employment in the discipline and in completing graduate study. Recent employers include Facebook, IBM, Liberty Insurance, Lockheed Martin, MetLife, Microsoft, New York Times, NSA, Susskindiana International Group, TMG Health, Tumble, and USPS with graduates earning competitive starting salaries. Alumni have completed advanced degrees at Carnegie Mellon, Drexel, Harvard, Indiana, Iowa State, Lehigh, Penn, Rensselaer, UConn, UMass, Yale, and other schools. The more than 1,200 accomplished alumni of these programs attest to the stability, relevance and quality of the educational experience here. Students are not only well prepared to enter their profession, but are also ready to evolve with and contribute to the discipline and the world as they learn throughout their careers.

Students

The low student to faculty ratio allows students to work closely with their instructors and with each other in the educational process. Many students pursue summer opportunities, including paid internships at Google, Guard, IBM, MetLife, WebMD, TMG Health, USPS, and recent NSF Research Experiences for Undergraduates (REU) at Auburn, Montclair St, New York Institute of Technology, Pittsburgh, and Tennessee Technological University.

Outstanding students are recognized by Upsilon Pi Epsilon (UPE), the honor society in the Computing Sciences. Many students are involved in the department’s Student Chapter of the Association for Computing Machinery (ACM) and the IEEE Student Branch.

Faculty

Major courses are taught by the department’s seven full-time faculty members. Their average of over 20 years of service to the University is indicative of the quality and stability of the department. The faculty’s commitment to scholarship is evidenced by their work with students, research and contributions to the discipline.

The department’s web page, at http://www.cs.scranton.edu, presents more about the programs, the people and the courses. Most faculty keep course related materials online and so browsing through these public pages offers a glimpse of what goes on in the courses offered.

Location/Contact

All faculty offices and departmental labs are located on the first floor of the Loyola Science Center (LSC), in McDonald and Milani halls. You can reach the department’s secretary at (570) 941-7774 and csmps@cs.scranton.edu and are encouraged to plan a visit.

The Department of Computing Sciences faculty offices and labs are most conveniently reached via the LSC entrance on Monroe Ave, directly across from The Estate.
**COMPUTER SCIENCE MAJOR**

This program’s focus is on mastering the underlying concepts of computing with a strong software engineering emphasis. The program utilizes cognate courses in mathematics and encourages students to prepare for advanced study and engineering careers by taking additional courses in mathematical sciences and computer science. Undergraduate students are encouraged to take a First Year Seminar and a General Education Requirement. Thus, the First Year Seminar provides students with a strong technical preparation in computing, pairing a course on software engineering with a capstone course in a second major. A noteworthy aspect of the program is that the Cognate Area requires both breadth and depth of study in relevant areas, and also provides an opportunity for the completion of a related minor. A capstone course in the senior year requires each student to complete a project under the direction of a faculty mentor. Opportunities exist for internship and practicum experience.

**APPLIED COMPUTING MAJOR**

This program provides students with a strong technical preparation in computing, pairing a course on software engineering with a capstone course in a second major. A noteworthy aspect of the program is that the Cognate Area requires both breadth and depth of study in relevant areas, and also provides an opportunity for the completion of a related minor. A capstone course in the senior year requires each student to complete a project under the direction of a faculty mentor. Opportunities exist for internship and practicum experience.

**INFORMATION TECHNOLOGY MAJOR**

This program provides students with knowledge and abilities that prepare them for a variety of computing careers as IT professionals and for continued professional development. The IT professional understands, evaluates, applies, and manages the information technology resources of individuals and organizations to assist them in achieving their goals and objectives. In addition to preparing students in an ever-changing technological landscape, the program also prepares them to be effective communicators and collaborators in diverse domains.

The major courses follow a well-defined prerequisite structure with important, major course topics such as computer networks and databases. A notable aspect is the fact that the Cognate Area requires both breadth and depth of study in relevant areas, and also provides an opportunity for the completion of a related minor. A capstone course in the senior year requires each student to complete a project under the direction of a faculty mentor. Opportunities exist for internship and practicum experience.

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**COMPUTER SCIENCE MAJOR**

**APPLIED COMPUTING MAJOR**

**INFORMATION TECHNOLOGY MAJOR**

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1. Computer Science majors must complete at least 8 credits of courses in a laboratory science for science or engineering majors. Qualifying sequences include PHYS 140 - PHYS 141; CHEM 112 - 113 or 114 – 115; BIOL 110 – 111; BIOL 110 – 112, with at least two of CMPS 250, CMPS 255, CMPS 355, CMPS 356, CMPS 366, CMPS 380, CMPS 562, CMPS 364, CMPS 370, CMPS 372, CMPS 376, CMPS 386, CMPS 393, CMPS 440, and CMPS 441. All courses must be completed with a grade of C or better.


3. At least two courses from one of the areas below, and at least one course from one of the other areas. Alternatives must be approved by the student’s Departmental Academic Advisor.

4. Additional requirements include ENGL 101, 103, or 104, and at least one of MATH 111, 113, or 115, or one of STAT 210, 220, or 250, or equivalent.

5. At least one course from each of the above areas, and at least two courses from one of the above areas. Alternatives must be approved by the student’s Departmental Academic Advisor.

6. Additional requirements include CSCI 211, 212, or 213, and at least one of MATH 111, 113, or 115, or one of STAT 210, 220, or 250, or equivalent.

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10. At least one course from each of the above areas, and at least two courses from one of the above areas. Alternatives must be approved by the student’s Departmental Academic Advisor.

11. Additional requirements include CSCI 211, 212, or 213, and at least one of MATH 111, 113, or 115, or one of STAT 210, 220, or 250, or equivalent.

12. At least one course from each of the above areas, and at least two courses from one of the above areas. Alternatives must be approved by the student’s Departmental Academic Advisor.

13. Additional requirements include CSCI 211, 212, or 213, and at least one of MATH 111, 113, or 115, or one of STAT 210, 220, or 250, or equivalent.

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