



**SUNY Plattsburgh
Computer Science Department**

Student Handbook

- Academic Programs:**
- Bioinformatics**
- Computer Science**
- Computer Security**
- Information Technology**
- Robotics**
- Web Design and Programming**



Winter 2017
www.cs.plattsburgh.edu/~plazaja/department/

Disclaimer.

This publication a general advising tool; the College Catalog from the year of your enrollment should be consulted as the only official document specifying the requirements.

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To Prospective Students

Dear Student:

Welcome to the Computer Science Department — the home of academic programs in Bioinformatics, Computer Science, Computer Security, Information Technology, Robotics, and Web Design and Programming. The department was created in 1970, and over the last 46 years has prepared thousands of students for careers in computing. As computing technology has evolved and changed, so have our courses — we always make sure that we present a current view of the discipline.

Over the years the department has developed strategies for selecting appropriate courses for students with varying backgrounds. Whatever your math background, we will place you in a course suitable for you. If you have never taken any computing courses, you can start in CSC 121 — this will help you see which area of computing is most interesting to you. If you took computing courses in high school or in another college, you can transfer them to SUNY Plattsburgh and move immediately to our intermediate or high level courses. If you gained computer related experience on your own or on a job, we will let you learn new topics without sitting in a course whose material you have already mastered.

While the main computer lab at the college uses Windows, our department's labs use Linux/UNIX. If you are not familiar with Linux, a 1-credit CSC 119 will get you started. This course can be taken concurrently with other courses in which students need to work in a Linux environment. Although all the work can be done in our computer labs, you may prefer to work at home — in such a case any computer (Windows, macOS or Linux) will allow you to do this (but iOS and Android tablets are not suitable for programming). We will recommend additional free software to install. The college provides recommendations for computer options, a computer service plan, free anti-virus software, on-line guides to using multimedia software, etc.

The department takes pride in offering students a lot of individual attention when they need help in their courses. Class sizes are small. Our weekly Video and Discussion meetings offer the opportunity to talk with faculty and fellow students about current issues in computing, science and engineering. To find out about scholarships, please contact the Office of Financial Aid. Whenever you have questions about requirements, courses suitable for you, preparation for a career, or searching for an internship or a job, your academic adviser at Computer Science Department will help you. You are always welcome to contact me with your questions and concerns, or to stop by my office to chat.

I remember my college years well — intellectually, they were the most exciting time of my life, and they offered a solid preparation for a lifetime career. I hope you will have the same experience and will enjoy studying at the Computer Science Department of SUNY Plattsburgh!

Best wishes,
Dr. Jan Plaza, Chair

The New Home of Computer Science



In 2013 we moved to a new building, Au Sable Hall, located by the intersection of Draper Avenue and Cornelia Street.

Choosing a Major

The Computer Science Department offers majors and minors in Computer Science (CS), Computer Security (SEC), and Information Technology (IT), and additional minors in Bioinformatics, Robotics, and Web Design and Programming.

Computer Science (CS) explores programming and theoretical foundations of computing with emphasis on algorithms and mathematical principles. Computer scientists work on developing new designs for hardware and software. CS majors prepare for careers in software development or for graduate studies in any area of computing. If you dream about designing space missions at NASA, this can be your starting point!

Computer Security (SEC) deals with major challenges experienced whenever computers are used, in all sectors of life: small businesses, large corporations, organizations, law enforcement, the military, and the government. Computer security professionals analyze and counteract threats to networks and computer systems, detect intrusions and assure privacy.

This work is highly valued, and demand for professionals with such an expertise is expected only to grow. To work on computer security one needs a very rigorous preparation including fundamentals of hardware and software.

Information Technology (IT) is concerned with forming and maintaining computing environments for businesses and organizations. Information technicians choose and configure hardware and software, monitor performance and security of databases, web servers and computer networks. If you dream about providing computing support at the 21st century level, IT is for you! IT technicians are sought in health care, financial or educational services, commerce and manufacturing. As our IT major requires only a small number of credits, it can be easily taken as a second major.

According to recent job market analysis, computing jobs form one of the fastest growing segments and will remain in that position for a number of years. Because of security concerns, most current and future computing jobs will not be subject to outsourcing — they will remain in the country. Altogether, CS, SEC and IT are excellent career choices for life!

If you like programming, problem solving and math, choose the CS major. And, if you want to make it even stronger, add the SEC, IT or Robotics Minor.

If you like problem solving and math, choose the SEC major. And, if you want to make it even stronger, add the CS or IT Minor.

If you like problem solving but are not sure what major to choose, start with the IT major — it requires a smaller number of credits and gives you flexible options:

- you can later switch to SEC or CS Major;
- If you decide to build more strength, you can add SEC or CS Minor;
- You can add a second major. The 43 credits devoted to IT-BA should still be quite easy to complete. But if you wish, you can replace the IT major with a minor. Your knowledge and skills in IT will nicely complement those of another area and will be highly marketable when you start looking for a job.
- You can turn the IT Major into IT Minor and choose a Major in an area other than computing.

- Because of an overlap in requirements for CS, SEC and IT majors, it is easy to switch after one semester from one major to another.
- In the case of computing disciplines, BS - Bachelor of Science degree is more respected than BA - Bachelor of Arts; a BA version of a computing major is typically used only as a second major.
- Double majors are encouraged, but you cannot choose two majors from among CS, SEC and IT, because they share too many courses.
- To strengthen a computing major, add a minor in another area of computing. In the case of minors in IT, CS or SEC, 6-7 credits can be counted towards both the major and the minor, so instead of taking 18-22 credits for the minor, you need only 12-15.

Computing majors:

- CS major (BS 61-71 cr., and BA 52-62 cr.)

- SEC major (BS 54-65 cr.)
- IT major (BS 55-63 cr., and BA 43-51 cr.)

Computing minors:

- CS minor (add 12 cr. to the major)
- SEC minor (add 15 cr. to the major)
- IT minor (add 12 cr. to the major)

Interdisciplinary minors related to computing:

- Bioinformatics Minor for Computer Science Students (add 18-21 cr. to the major)
- Robotics Minor — Physics Emphasis (add 12-19 cr. to the major)
- Web Design and Programming Minor (add 12-18 cr. to the major)

Our courses, whether in IT, CS or SEC, have the same prefix, CSC.

Many students choose a major and a minor, or even two minors. Some of our students choose a double major. However, please notice that the recipients of state or federal financial aid are bound by the rule that the aid will cover only 120 credits and by some other restrictions that can be explained by the Office of Financial Aid. Students with strong academic results enroll in the Honors Program or write a thesis for an advanced honors project. They also register as Teaching Assistants at our department or work as tutors in the Learning Center. We encourage you to consider right from the start how you can distinguish yourself.

Careers

Our academic programs prepare for the following careers.

- Computer programmers (CS major + Security minor),
- Computer software engineers and software developers (CS major + Security minor),
- Computer scientists in education and research, after a grad school (CS major + Math minor),
- Database administrators (IT major + Security minor),
- Information security analysts (SEC major + CS or IT minor),
- Web developers (CS/IT major + Web minor),
- Computer support specialists and technicians (IT major + Security minor),
- System and network administrators (IT major + Security minor),
- Network architects (IT major + Security minor)
- Computer systems analysts providing solutions for organizations (IT + Security minor).

The jobs which could be moved overseas have already been moved — most current computer-related jobs cannot be outsourced to other countries due to security concerns.

An increased spectrum of jobs becomes available after earning a graduate degree; our CS major offers excellent preparation for **graduate studies**. Some of our recent graduates

were accepted in graduate CS programs at the Oxford University (UK), Cornell University (USA), and other distinguished universities.

From the Bureau of Labor Statistics

Occupational Outlook Handbook, section on Computer and Information Technology lists ten occupation areas related to computers:

- 2 areas — Associate degree or no degree, median pay \$50,000 - 63,000, (computer support specialists, web developers)
- **7 areas — Bachelor's degree, median pay \$76,000 - 98,000, (computer network architects, computer programmers, computer system analysts, database administrators, information security analysts, network and computer systems administrators, software developers)**
- 1 area — advanced degree, median pay \$108,000. (computer and information research scientists)

5 out of the 7 highlighted areas are projected to grow faster or much faster than the average through at least 2024; demand for information security analysts and for software developers is forecasted to grow much faster than average.

Computer Science Major, BS or BA

Two variants are available:

Curriculum 782 — Bachelor of Science (BS) in Computer Science — total credits for the major: 61-71;

Curriculum 781 — Bachelor of Arts (BA) in Computer Science — total credits for the major: 52-62.

The BS variant is recommended; it requires 9 more credits in elective 300/400-level CSC courses.

A. Departmental Requirements (50-53 cr. for BS; 41-44 cr. for BA)

1. Computing Prerequisites (0-3 cr.) One of the following, by advisement:
 - Familiarity with simple programming (0 cr.)
 - CSC 121 (3 cr.) Introduction to Computing and the Web
 - CSC 122 (3 cr.) Physical Computing
 - CSC 123 (3 cr.) Scientific Simulation and Modeling
2. CSC 119 (1 cr.) Introduction to UNIX/Linux
3. CSC 217 (3 cr.) Discrete Math with Computer Science Applications I — **recommended** or MAT 361 (3 cr.) Probability and Statistics (for double majors)
4. CSC 221 (3 cr.) Introduction to Programming
5. CSC 223 (3 cr.) Data Structures and Algorithms
6. CSC 309 (1 cr.) Programming Language C — **this is a corequisite for CSC 333 and prereq for CSC 433; ask your Advisor**

7. CSC 318 (3 cr.) Discrete Math with Computer Science Applications II — **recommended**
or MAT 231 (3 cr.) Sets, Functions and Relations (for double majors)
8. CSC 319 (3 cr.) Object-Oriented Design and Programming
9. CSC 321 (3 cr.) Design and Analysis of Algorithms
10. CSC 333 (3 cr.) Computer Organization
11. CSC 336 (3 cr.) Software Engineering I
12. CSC 372 (3 cr.) Ethics in the Age of Technology and Information
13. CSC 422 (3 cr.) Theory of Computation
14. CSC 433 (3 cr.) Operating Systems
15. CSC 446 (3 cr.) Software Design Studio
16. Electives, in different versions for BA and BS.
 - For BA, select three credits in any 300/400-level CSC courses.
 - For BS, select twelve credits in 300/400-level CSC courses with the following restrictions:
only 3 credits in CSC 310 Perl or CSC 311/312/313 Computer Language can be counted;
only 3 credits in CSC 436 Software Engineering II can be counted;
only 3 credits in CSC 496 Teaching Assistantship can be counted;
only 3 credits in CSC 497 Computing Practicum or CSC 498 Internship can be counted.

B. Cognate Requirements (11-18 cr.)

1. Communication Elective (3 cr.) — select one course:
 - CMM 101 (3 cr.) Introduction to Public Speaking — **recommended**
 - an additional AWR course other than CSC 372 (for double majors).
2. Mathematics Prerequisites/Placement (0-6 cr.):
MAT 101 (3 cr.) Elementary College Mathematics **or** higher Math Placement (0 cr.)
MAT 102 (3 cr.) Precalculus **or** Calculus Readiness Test (0 cr.)
3. Calculus Elective (5 cr.) — select one sequence:
 - MAT 104 (1 cr.) Trigonometry **and** MAT 224 (4 cr.) Calculus I — **recommended**
 - MAT 104 (1 cr.) Trigonometry **and** MAT 221 (3 cr.) Calculus for Social Studies (only if enrolled before summer 2016)
4. Mathematics Elective (3-4 cr.) — select one course:
 - MAT 202 (3 cr.) Linear Algebra — **recommended**
 - MAT 225 (4 cr.) Calculus II

C. Additional Requirements

1. A minimum overall GPA of 2.0 in courses taken under the Departmental Requirements above.
2. A grade of C or better in CSC 221 and CSC 223.

NOTES

1. Some courses or tests need to be taken early during the studies.
 - Passing Calculus Readiness Test or completing MAT 102 Precalculus with a grade of C or better are prerequisites for CSC 217 and CSC 221. Take the Calculus Readiness Test or MAT 102 early; if needed take MAT 101 before 102, according to the results of the Math Placement Test.
 - In order to try computer programming and to strengthen such background, before enrolling in CSC 221 consider taking (optionally) CSC 121/122/123.

- The core courses, CSC 119, CSC 217 and CSC 221, should be taken early because almost all the remaining courses have these three as pre-requisites.
2. The degree is awarded after completing all the college requirements and obtaining a total of 120 credits.
- About 33 credits are required in General Education courses, in specific categories. CMM 101, which is required for this major, will count as a Gen-Ed, and also CSC 217. Take ENG 101, LIB 200 and CMM 101 early, because they are prerequisites for CSC 372.
 - 45 upper-level credits are required (at the 300/400-level). The BS variant of the major will contribute 40 such credits; the BA variant — 31 credits. A General Education course in Global Issues will contribute 3 more credits.
 - 60 liberal art credits are required for graduation with a BS, and the courses of the major and General Education courses will contribute significantly to completing this requirement. The BA variant is typically taken as a second major, because it requires many additional courses to complete the 90 liberal arts credits required for a BA degree.



Computer Security Major, BS

Curriculum 311 - Bachelor of Science (BS) in Computer Security - Total credits for the major: 54-65

- A. **Computing Prerequisites** (0-3 cr.) One of the following, by advisement:
- Familiarity with simple programming (0 cr., no courses to take)
 - CSC 121 (3 cr.) Introduction to Computing and the Web
 - CSC 122 (3 cr.) Physical Computing
 - CSC 123 (3 cr.) Scientific Simulation and Modeling
- B. **Core Requirements** (35 cr.)
1. CSC 119 (1 cr.) Introduction to UNIX/Linux
 2. CSC 152 (3 cr.) Computer Security and Society
 3. CSC 217 (3 cr.) Discrete Mathematics with Computer Applications
 4. CSC 221 (3 cr.) Introduction to Programming
 5. CSC 309 (1 cr.) Programming Language C (with Deviation Form) **unless enrolled before summer 2016 and completed CSC 319 C/C++**
 6. CSC 318 (3 cr.) Discrete Mathematics with Computer Applications II **unless enrolled before summer 2016 and completed Calculus**
 7. CSC 320 (1 cr.) System Administration
 8. CSC 323 (1 cr.) System Administration Tools
 9. CSC 323 (1 cr.) System Administration Tools, with a different topic than that above
 10. CSC 333 (3 cr.) Computer Organization
 11. CSC 336 (3 cr.) Software Engineering (with Deviation Form) **unless enrolled before summer 2016 and completed CSC 319 C/C++**
 12. CSC 352 (3 cr.) Computer Security
 13. CSC 357 (3 cr.) Computer Networks
 14. CSC 372 (3 cr.) Ethics in the Age of Technology and Information
 15. CSC 433 (3 cr.) Operating Systems
- C. **Elective Concentration** - select one concentration (10-12 cr.)
1. Threat Analysis Concentration (10-12 cr.)
 - a. CSC 330 (3 cr.) Human Computer Interaction
 - b. One of the following sequences of courses:
 - CSC 310 (1 cr.) Perl **and** CSC 341 (3 cr.) Introduction to Databases with Web Applications
 - CSC 223 (3 cr.) Data Structures and Algorithms **and** CSC 441 (3 cr.) Database Management Systems
 - c. CSC 452 (3 cr.) Threat Modeling and Analysis
 2. Reliability Concentration (11 cr.)
 - a. CSC 223 (3 cr.) Data Structures and Algorithms
 - b. CSC 310 (1 cr.) Perl
 - c. CSC 311/312/313 (1 cr.) Computer Language
 - d. One of the following:
 - CSC 314 (3 cr.) Non-imperative Programming

- CSC 319 (3 cr.) Object-Oriented Design and Programming — **recommended**
 - CSC 383 (3 cr.) Embedded Systems (with Deviation Form)
 - e. CSC 456 (3 cr.) Reliable Systems
 - 3. Privacy Concentration (10-12 cr.)
 - a. CSC 223 (3 cr.) Data Structures and Algorithms
 - b. One of the following:
 - CSC 310 (1 cr.) Perl **and** CSC 341 (3 cr.) Introduction to Databases with Web Applications
 - CSC 321 (3 cr.) Design and Analysis of Algorithms **and** CSC 441 (3 cr.) Database Management Systems
 - c. CSC 442 (3 cr.) Data Mining
 - 4. Intrusion Detection Concentration (10-12 cr.)
 - a. One of the following sequences of courses:
 - CSC 310 (1 cr.) Perl **and** CSC 341 (3 cr.) Introduction to Databases with Web Applications
 - CSC 223 (3 cr.) Data Structures and Algorithms **and** CSC 441 (3 cr.) Database Management Systems
 - b. CSC 345 (3 cr.) Artificial Intelligence — **recommended** or CSC 445 (3 cr.) Knowledge Representation and Inference
 - c. CSC 462 (3 cr.) Intrusion Detection
 - 5. Management Information Systems Concentration (12 cr.)
 - a. MIS 418 (3 cr.) Foundations of Cybercrime and Cybersecurity
 - b. MIS 419 (3 cr.) Information Assurance and Network Control
 - c. MIS 420 (3 cr.) Data Privacy and Security
 - d. MIS 440 (3 cr.) Management Information Systems or CSC 341 (3 cr.) Introduction to Databases with Web Applications or CSC 441 (3 cr.) Database Management Systems
- D. **Security Elective** (3 cr.) - select one course not taken to satisfy your elective concentration, depending on the corequisites or completed prerequisites:
1. CSC 442 (3 cr.) Data Mining (corequisite: CSC 341/441 or MIS 402)
 2. CSC 452 (3 cr.) Threat Modeling and Analysis (prerequisite: CSC 352)
 3. CSC 456 (3 cr.) Reliable Systems (prerequisites: CSC 223 and 336)
 4. CSC 462 (3 cr.) Intrusion Detection (prerequisites: CSC 352 and 357)
- E. **Experiential Elective** (3 cr.) - select one course, depending on the completed prerequisites:
1. CSC 436 (3 cr.) Software Engineering II (prerequisite: CSC 336)
 2. CSC 446 (3 cr.) Software Engineering Studio (prerequisites: CSC 223 and 336)
 3. CSC 497 (3 cr.) Computing Practicum
 4. CSC 498 (3 cr.) Internship
- F. **Cognate Requirements** (3-9 cr.):
1. Communication Elective (3 cr.) - select one course:
 - a. CMM 101 (3 cr.) Introduction to Public Speaking — **recommended**
 - b. another Oral Expression Gen Ed, or an AWR course other than CSC 372, by advisement (for double majors and transfer students)
 2. Mathematics Prerequisites/Placement (0-6 cr.):
 - a. MAT 101 (3 cr.) Elementary College Mathematics **or** a higher result in Math Placement (0 cr.)
 - b. MAT 102 (3 cr.) Precalculus **or** passing Calculus Readiness Test (0 cr.)

G. Additional Requirement:

Grade C or better in every course taken for sections A-E above.

NOTES

1. Some courses or tests need to be taken early during the studies.
 - Passing Calculus Readiness Test or completing MAT 102 Precalculus with a grade of C or better are prerequisites for CSC 217 and CSC 221. Take the Calculus Readiness Test or MAT 102 early; if needed take MAT 101 before 102, according to the results of the Math Placement Test.
 - In order to try computer programming and to strengthen such background, before enrolling in CSC 221 consider taking (optionally) CSC 121/122/123.
 - The core courses, CSC 119, CSC 217 and CSC 221, should be taken early because almost all the remaining courses have these three as pre-requisites.
2. The degree is awarded after completing all the college requirements and obtaining a total of 120 credits.
 - About 33 credits are required in General Education courses, in specific categories. CMM 101, which is required for this major, will count as a Gen-Ed, and also CSC 217. Take ENG 101, LIB 200 and CMM 101 early, because they are prerequisites for CSC 372.
 - 45 upper-level credits are required (at the 300/400-level). The courses for the major will contribute at least 40 such credits; A General Education course in Global Issues will contribute 3 more credits.
 - 60 liberal art credits are required for graduation with a BS, and the courses of the major and General Education courses will contribute significantly to completing this requirement.
3. Students who have enrolled in the Computer Security Major in the Spring 2016 or earlier, but who have not taken CSC 319 C/C++ by the Spring 2016, may need to ask the CSC Academic Advisor to fill out a Deviation Form to substitute CSC 309 plus CSC 336 for CSC 319. (Every student is subject to the requirements as they were formulated at the time of their enrollment in the major, but it may be advantageous to take a deviation that follows the line of a newer version of the requirements.)

Information Technology Major, BS or BA

Two variants are available:

Curriculum 305 — Bachelor of Science (BS) in Information Technology — total credits for the major: 55-63;

Curriculum 308 — Bachelor of Arts (BA) in Information Technology — total credits for the major: 43-51.

The BS variant is recommended; it requires 12 more credits in elective CSC 300/400-level courses or in CSC 285.

A. Departmental Requirements (49 cr. for BS; 37 cr. for BA)

1. CSC 119 (1 cr.) Introduction to UNIX/Linux
2. CSC 121 (3 cr.) Introduction to Computing and the Web
or CSC 122 (3 cr.) Physical Computing

3. CSC 217 (3 cr.) Discrete Math with Computer Science Applications — **recommended**
or MAT 361 (3 cr.) Probability and Statistics (for double majors)
4. CSC 221 (3 cr.) Introduction to Programming
5. CSC 310 (1 cr.) Perl
6. CSC 311/312/313 (1 cr.) Computer Language
7. CSC 320 (1 cr.) System Administration
8. CSC 330 (3 cr.) Human Computer Interaction
9. CSC 336 (3 cr.) Software Engineering I
10. CSC 341 (3 cr.) Introduction to Databases with Web Applications — **recommended**
or CSC 441 (3 cr.) Database Management Systems (for Computer Science minors)
11. CSC 352 (3 cr.) Computer Security — **unless enrolled before summer 2016**
12. CSC 357 (3 cr.) Computer Networks
13. CSC 372 (3 cr.) Ethics in the Age of Technology and Information
14. CSC 436 (3 cr.) Software Engineering II
15. Experiential Electives (3 cr.) — select three credits:
 - CSC 436 (3 cr.) Software Engineering II, with a different topic than CSC 436 in A.13. above
 - CSC 496 (1-2 cr.) Teaching Assistantship — may be repeated
 - CSC 497 (3 cr.) Computing Practicum
 - CSC 498 (3 cr.) Internship
16. Other Electives (only for BS, 12 cr.) — select twelve credits in:
 - CSC 285 (3 cr.) Topics in Computing
 - 300/400-level CSC courses
 with the following restrictions:
 only three credits in CSC 285 can be counted;
 only two credits in CSC 309 or CSC 311/312/313 can be counted;
 no credits in CSC 436, CSC 496, CSC 497, CSC 498 can be counted.

B. Cognate Requirements (6-14 cr.)

1. Communication Elective (3 cr.) — select one course:
 - CMM 101 (3 cr.) Introduction to Public Speaking — **recommended**
 - an additional AWR course other than CSC 372 (for double majors).
2. Mathematics Prerequisites/Placement (0-6 cr.):
 - a. MAT 101 (3 cr.) Elementary College Mathematics **or** a higher result in Math Placement (0 cr.), and
 - b. MAT 102 (3 cr.) Precalculus **or** passing Calculus Readiness Test (0 cr.)
3. Math Elective (3-5 cr.) — select one option:
 - BIO 333 (3 cr.) Biostatistics
 - CSC 318 (3 cr.) Discrete Math with Computer Applications II (if not counted towards A16)
 - ECO 260 (3 cr.) Business Statistics I
 - ENV 333 (3 cr.) Biostatistics
 - MAT 161 (3 cr.) Introductory Statistics — **recommended**
 - MAT 221 (3 cr.) Calculus for Life, Management and Social Sciences I
 - MAT 104 (1 cr.) Trigonometry **and** MAT 224 (4 cr.) Calculus I

C. Additional Requirements

1. A minimum overall GPA of 2.0 in courses taken under section A of the major requirements above.
2. A grade of C or better in CSC 121/122 and CSC 221.

NOTES

1. The requirements of the Information Technology Major BS from catalog years up to 2012/2013 are the same as those for BA above.
2. Some courses or tests need to be taken early during the studies.
 - Passing Calculus Readiness Test or completing MAT 102 Precalculus with a grade of C or better are prerequisites for CSC 217 and CSC 221. Take the Calculus Readiness Test or MAT 102 early; if needed take MAT 101 before 102, according to the results of the Math Placement Test.
 - CSC 121 or CSC 122 should be taken before CSC 221.
 - The core courses, CSC 119, CSC 217 and CSC 221, should be taken early because almost all of the remaining courses have these three as pre-requisites.
3. The degree is awarded after completing all the college requirements and obtaining a total of 120 credits.
 - About 33 credits are required in General Education courses, in specific categories. CMM 101, which is required for this major, will count as a Gen-Ed, and also CSC 217. Take ENG 101, LIB 200 and CMM 101 early, because they are prerequisites for CSC 372.
 - 45 upper-level credits are required (at the 300/400-level). The BS variant of the major will contribute at least 36 such credits; the BA variant — 27 credits. A General Education course in Global Issues will contribute 3 more credits.
 - 60 liberal art credits are required for graduation with a BS, and the courses of the major and General Education courses will contribute significantly to completing this requirement. The BA variant is typically taken as a second major, because it requires many additional courses to complete the 90 liberal arts credits required for a BA degree.
4. For students who declared the major by the Spring 2016, CSC 352 is a recommended elective, not a required course.

Bioinformatics Minor for Majors in Computer Science (781, 782)

Minor Code: 1022.

Coordinator: N. Buckley (Department of Biological Sciences).

Total credits for the minor: 21.

A. Required courses

1. BIO 101 (4cr) General Biology I (Gen Ed 5NST, prereq.: none)
2. BIO 305 (4cr) General Genetics (prereq.: BIO 101, CHE 112)
3. BIO 333 (3cr) Biostatistics (prereq.: a 100-level science course, sophomore standing)
4. BIO 341 (3cr) DNA and Bioinformatics (prereq.: BIO 305 and CHE 112)
5. CHE 112 (4cr) Fundamental Principles of Chemistry (Gen Ed 5NST, prereq.: minimum grade of C in CHE 111)
6. CSC 441 (3cr) Database Management Systems (prereq.: CSC 318, CSC 223)

- B. Overlap restriction: At least 14 out of the required 21 credits must be taken in courses that do not count toward student's majors and other minors.

Computer Science Minor

Minor code: 1408.

Coordinator: J. Plaza (Department of Computer Science).

Total credits for the minor: 19.

A. Required Courses (10 cr.)

1. CSC 119 (1 cr.) Introduction to UNIX/Linux (prereq.: none)
2. CSC 217 (3 cr.) Discrete Math with Computer Applications I (Gen Ed 5MAT , prereq.: MAT 102 Precalculus)
or MAT 231 (3 cr.) Sets, Functions and Relations (prereq.: MAT 225 Calculus II)
3. CSC 221 (3 cr.) Introduction to Programming (prereq.: familiarity with programming or CSC 121/122/123; coreq.: familiarity with UNIX/Linux or CSC 119)
4. CSC 223 (3 cr.) Data Structures and Algorithms (prereq.: CSC 221 with a grade of C or better and CSC 217)

B. Elective Courses (9 cr.)

Select nine credits from among:

- any 300/400-level CSC courses
except CSC 497 Computing Practicum and CSC 498 Internship,
- at most one course from the following:
PHY 350 (3 cr.) Circuits and Electronics (prereq.: MAT 225 Calculus II, PHY 112)
or PHY 365 (4 cr.) Electronics for Scientists (prereq.: PHY 112)
or PHY 379 (4 cr.) Introduction to Robotics (prereq.: PHY 111, MAT 225 or MAT 202, co- or pre-requisite CSC 221)

C. Additional Requirements

1. Only three credits in CSC 309 Programming Language C, CSC 310 Perl and CSC 311/312/313 Computer Language can be counted;
2. Only three credits in CSC 496 Instructional Practicum can be counted;
3. Overlap restriction: At least 12 out of the required 19 credits must be taken in courses not counted toward student's majors or other minors.

Computer Security Minor

Minor code: 1104.

Coordinator: D. Hart (Department of Computer Science).

Total credits for the minor: 22.

A. Required Courses (16 cr.)

1. CSC 119 (1 cr.) Introduction to UNIX/Linux (prereq.: none)
2. CSC 152 (3 cr.) Computer Security and Society (prereq.: none)

3. CSC 217 (3 cr.) Discrete Math with Computer Applications I (Gen Ed 5MAT, prereq.: MAT 102 Precalculus with grade C)
 4. CSC 221 (3 cr.) Introduction to Programming (prereq.: MAT 102 Precalculus with grade C, familiarity with programming or CSC 121/122/123; coreq.: familiarity with Linux or CSC 119)
 5. CSC 352 (3 cr.) Computer Security (prereq.: CSC 221)
 6. CSC 357 (3 cr.) Computer Networks (prereq.: CSC 221)
- B. Security Electives** - at least one option (at least 3 cr.):
- CSC 452 (3 cr.) Threat Analysis and Modeling (prereq.: CSC 352)
 - CSC 462 (3 cr.) Intrusion Detection (prereq.: CSC 352, CSC 357)
 - All of the following (9 cr.):
 - CSC 223 (3 cr.) Data Structures and Algorithms (prereq.: CSC 221, CSC 217) and
 - CSC 336 (3 cr.) Software Engineering I (prereq.: CSC 221) and
 - CSC 456 (3 cr.) Reliable Systems (prereq.: CSC 223, CSC 336)
- C. Additional Electives** - select from the following options as needed to satisfy the requirements in D below, while paying attention to pre-requisites.
- CSC 309 (1 cr.) Programming Language C (prereq.: CSC 221) **with Deviation Form**
 - CSC 310 (1 cr.) Perl (prereq.: CSC 221) **with Deviation Form**
 - CSC 311/312/313 (1 cr.) Computer Language (may be repeated with a different topic, prereq.: CSC 221) **with Deviation Form**
 - CSC 319 (3 cr.) Object-Oriented Design and Programming (prereq.: CSC 221) **with Deviation Form**
 - CSC 320 (1 cr.) System Administration (may be repeated with a different operating system, coreq.: CSC 119, prereq.: CSC 221) **with Deviation Form**
 - CSC 323 (1 cr.) System Administration Tools (may be repeated with a different topic, (prereq.: CSC 320) **with Deviation Form**
 - CSC 330 (3 cr.) Human-Computer Interaction (prereq.: CSC 121 or CSC 221)
 - CSC 336 (3 cr.) Software Engineering I (prereq.: CSC 221)
 - CSC 341 (3 cr.) Intro. Databases with Web Applications (prereq.: CSC 310)
 - CSC 345 (3 cr.) Artificial Intelligence (prereq.: CSC 217 and CSC 221)
 - CSC 442 (3 cr.) Data Mining (prereq.: CSC 217 or MAT 161 or Statistics; coreq.: CSC 341/441 or MIS 402)
 - All of the following (9 cr.):
 - CSC 223 (3 cr.) Data Structures and Algorithms (prereq.: CSC 217 and CSC 221) and
 - CSC 318 (3 cr.) Discrete Mathematics II (prereq.: CSC 217) **with Deviation Form** and
 - CSC 441 (3 cr.) Database Management Systems (prereq.: CSC 223 and CSC 318)
- D. Additional Requirements**
1. Overlap restriction: at least 15 out of the required 22 credits must be taken in courses not counted toward student's majors or other minors.
 2. At most 3 credits can be counted in CSC 309, CSC 310, CSC 311/312/313.
 3. At most 3 credits can be counted in CSC 320 and CSC 323 (with different topics).

Information Technology Minor

Minor code: 1014.

Coordinator: J. Plaza (Department of Computer Science).

Total credits for the minor: 18.

A. Required Courses (9 cr.)

1. CSC 119 (1 cr.) Introduction to UNIX/Linux (prereq.: none)
2. CSC 217 (3 cr.) Discrete Mathematics with Computer Science Applications I (Gen Ed 5MAT , prereq.: MAT 102 Precalculus) or MAT 231 (3 cr.) Sets, Functions and Relations (prereq.: MAT 225 Calculus II)
3. CSC 221 (3 cr.) Introduction to Programming (prereq.: familiarity with programming or CSC 121/122/123; coreq.: familiarity with UNIX/Linux or CSC 119)
4. CSC 310 (1 cr.) Perl (prereq.: CSC 221) or CSC 311/312/313 (1 cr.) Computer Language (prereq.: CSC 221)
5. CSC 320 (1 cr.) Systems Administration (prereq.: CSC 221; coreq.: CSC 119)

B. Elective Courses (9 cr.)

Select nine credits from among:

- One of the following:
 - CSC 121 (3 cr.) Introduction to Computing and the Web (prereq.: none) or CSC 123 (3 cr.) Scientific Simulation and Modeling (prereq.: none)
- CSC 310 (1 cr.) Perl (prereq.: CSC 221)
- CSC 311/312/313 (1 cr.) Computer Language (prereq.: CSC 221) may be repeated with different languages up to 3 times.
- CSC 323 (1 cr.) System Administration Tools (prereq.: CSC 320)
- CSC 330 (3 cr.) Human Computer Interfaces (prereq.: CSC 121 or CSC 221)
- CSC 336 (3 cr.) Software Engineering I (prereq.: CSC 221)
- CSC 341 (3 cr.) Introduction to Databases with Web Applications (prereq.: CSC 310)
- CSC 352 (3 cr.) Computer Security (prereq.: CSC 221)
- CSC 357 (3 cr.) Computer Networks (prereq.: CSC 221)
- CSC 372 (3 cr.) Ethics in the Age of Technology and Information (prereq.: ENG 101; LIB 105; CSC 121 or experience in programming; junior standing)
- CSC 436 (3 cr.) Software Engineering II (prereq.: CSC 336)
- CSC 441 (3 cr.) Database Management Systems (prereq.: CSC 318, CSC 223)
- CSC 442 (3 cr.) Data Mining (prereq.: CSC 223, and either CSC 341 or 441)
- CSC 452 (3 cr.) Threat Analysis and Modeling (prereq.: CSC 330 or 336 or 341 or 441, and CSC 352)
- CSC 456 (3 cr.) Reliable Systems (prereq.: CSC 223 and CSC 336)
- CSC 462 (3 cr.) Intrusion Detection (prereq.: CSC 352 and CSC 357)
- CSC 485 (3 cr.) Advanced Topics in Computing (prereq.: vary) may be repeated with different topics.
- CSC 496 (1-2 cr.) Instructional Practicum (Teaching Assistant-ship) (prereq.: POI) may be repeated for up to 3 credits.

- ## C. Overlap restriction: at least 12 out of the required 18 credits must be taken in courses not counted toward student's majors or other minors.

Robotics Minor — Emphasis in Physics

Open to all majors other than Physics (715, 751).

Minor Code: 1028.

Coordinator: T. Wolosz (Department of Physics).

Total credits for the minor: 18-19.

- A. Required courses (14 cr.)
 - 1. PHY 111 (4cr) General Physics I (coreq.: MAT 224)
 - 2. PHY 112 (4cr) General Physics II (prereq.: PHY 111, coreq.: MAT 225)
 - 3. PHY 379 (4cr) Introduction to Robotics (prereq.: PHY111, MAT225 or MAT202, co- or prerequisite CSC221)
 - 4. CSC 345 (3cr) Artificial Intelligence (prereq.: CSC 221)
- B. Electives — 3-4 cr. chosen from among the following:
 - 1. PHY 365 (4 cr.) Electronics for Scientists (prereq.: PHY 112).
 - 2. CSC 399/499 or PHY 399/499 (1-3 cr.) Independent Study (prereq.: POI) with an approved topic relevant to robotics; can be repeated for credit with a different topic.
 - 3. CSC 495 or PHY 495 (1-3 cr.) Undergraduate Research (prereq.: POI) with an approved topic relevant to robotics; can be repeated for credit with a different topic.
- C. Overlap restriction: At least 12 out of the required 18-19 credits must be taken in courses that do not count toward student's majors and other minors.

Web Design and Programming Minor

Minor Code 1020.

Coordinator: J. Plaza, Computer Science Department.

Total credits for the minor: 18.

- A. Required Courses (9 cr.)
 - 1. ART 104 (3 cr.) Basic Design: 2-D (Gen Ed 5ART , prereq.: none) or ART 205 (3 cr.) Intro Graphic Design (prereq.: none)
 - 2. CSC 221 (3 cr.) Intro Programming (prereq.: grade \geq C in MAT 102 Precalculus, familiarity with programming or CSC 121/122/123; coreq.: familiarity with UNIX/Linux or CSC 119) or MIS 303 (3 cr.) Intro Business Appl. Progr. (prereq.: MIS 275)
 - 3. CMM 242 (3 cr.) Basic Web Design (prereq.: none) or JOU 317 (3 cr.) Web Design and Production (prereq.: ENG 101)
- B. Design and Content Elective (3-4 cr.) — select one course:
 - ART 305 (3 cr.) Graphic Design II (prereq.: ART 205 or POI)

- ART 306 (3 cr.) Digital Imaging (prereq.: ART 305 or POI)
 - ART 407 (3 cr.) Design in Interactive Media (prereq.: ART 305, ART 306 or POI)
 - CMM 240/JOU 240 (3cr.) Audio-Video Prod. for Public Rel. and Journalism (CMM 240 has prerequisites CMM 101, CMM 226. JOU 240's prerequisite JOU 206 and its restriction to journalism majors can be waived the Journalism Department chair.)
 - CMM 360/JOU 360 (3 cr.) Interactive Journalism (prereq.: JOU 317 or CMM 242 or CMM 312 or POI or permission of the Journalism Department chair.)
 - CMM 434 (4 cr.) Advanced Web Design (prereq.: CMM 242 or JOU 317 or POI)
 - CSC 330 (3 cr.) Human Computer Interfaces (prereq.: CSC 121 or CSC 122 or CSC 221)
- C. Programming Elective (3 cr.) — select 3 credits from the following:
- CSC 310 (1 cr.) Perl (prereq.: CSC 221)
 - CSC 311/312/313 (1 cr.) Programming Language (prereq.: CSC 221) — may be repeated with a different language
 - CSC 320 (1 cr.) System Administration (prereq.: CSC 221, coreq. CSC 119)
 - CSC 323 (1 cr.) System Administration Tools (prereq.: CSC 320) — requires Deviation Form sigend by Minor Coordinator; may be repeated with a different topic
 - CSC 341 (3 cr.) Intro Databases with Web Applications (prereq.: CSC 310)
 - CSC 441 (3 cr.) Database Management Systems (prereq.: CSC 223, CSC 318) — requires Deviation Form sigend by Minor Coordinator
 - MIS 402 (3 cr.) Database Management (prereq.: MIS 303)
- D. Additional Electives (2-3 cr.) — select additional credits from categories B or C to bring the total credits from B and C to a minimum of 9.
- E. Overlap restriction: at least 12 out of the required 18 credits must be taken in courses not counted toward student's majors and other minors.

CSC Course Descriptions

CSC119 - Introduction to UNIX/Linux (1 cr.) Study of the features of the UNIX/Linux operating systems from the standpoint of a user. Includes practice of using computers over the network through ssh, sftp and X-server. (Fall/Spring).

CSC121 - Introduction to Computing and the Web (3 cr.) Introduction to computer science through Web-based projects. Describes the basic operations of computers covering hardware and software. Covers the use of communication technology through the Internet. Focuses on problem solving and algorithms. Teaches how programming languages are used to implement solutions to practical problems. Covers social issues associated with computing and computer science. (Fall/Winter/Spring/Summer). Liberal arts.

CSC122 - Physical Computing (3 cr.) Micro-controller boards and basic electronic components are used to explore programming and development of algorithms. Students will build circuits and program the microcontroller to control electronic devices. Topics include: data representations, Boolean logic and digital circuits, microprocessor organization and operation, basic electronics, and programming in a high level language. For students in any major. No prior experience in computing, science, or technology is required. Liberal arts. (Fall).

CSC123 - Scientific Simulation and Modeling (3 cr.) Introduction to the use of simulations for scientific study. Students will design experiments and employ the scientific method in the context of simulations in a specific natural science. Students will gain knowledge about computer hardware and software. A programming language will be used as a means to formally describe and solve domain specific problems. Each course offering will focus on a specific discipline for which simulation and modeling is valuable. (Fall/Spring). Liberal arts.

CSC152 - Computer Security and Society (3 cr.) Survey of the field of computer security at a non-technical level. The course will discuss the importance and role of security as computing becomes more tightly integrated with society. The course will examine the ethical issues related to computer security including privacy, identity theft, and liability. (Fall). Liberal arts.

CSC199 - Independent Study (1 to 15 cr.) Project individually arranged by student and faculty sponsor. Requires completion of the Independent Study form and approval by the Faculty Sponsor, Academic Advisor, Department Chair and Academic Dean. (Fall, Winter, Spring, Summer).

CSC217 - Discrete Mathematics with Computer Applications (3 cr.) Basic propositional and predicate logic. Concepts of sets, relations and functions. Directed and undirected graphs and trees; traversals. Solving recurrences. Basic Modular arithmetic. Counting and discrete probability (Bayes theorem, Bernoulli and binomial distributions, expectation). Hypothesis testing. Sampling and descriptive statistics (variance and standard deviation). Liberal arts. (Fall/Spring). Prerequisite: grade of C or better in MAT102 or passing the Calculus Readiness Test.

CSC221 - Introduction to Programming (3 cr.) Problem solving through constructing ad-hoc algorithms and translating them into well designed and correct programs in an object-oriented programming language (currently Python). Introduces basic programming constructs including exception handling, classes, listarrays, maps/dictionaries, text file I/O, and beginning GUI programming with event handling. Includes selection and search algorithms. Attention is given to modular program design with functions, classes and modules, data representation in the computer memory, mutability/immortality, tracing program execution and debugging, input data validation, and programming style. 3 hour lecture plus laboratory. Liberal arts. (Fall/Spring). Corequisites: familiarity with UNIX/Linux or CSC119. Prerequisite: grade of C or better in MAT102 or equivalent; also familiarity with programming or CSC121 or CSC122 or CSC123.

CSC223 - Data Structures and Algorithms (3 cr.) Organization of data into listarrays, stacks, queues, priority queues, binary trees, binary search trees. Alternative data structures that implement the same abstract data type. Asymptotic analysis of related algorithms, including amortized analysis. Recursion and memoization. Iterative and recursive search, merge and various sort algorithms for lists. Breadth-first search for trees, iterative and recursive depth first search. Object oriented programming projects with unit testing, reusable software. Liberal arts. (Spring). Prerequisites: CSC217; CSC221 with a grade of C or better.

CSC285 - Topics in Computing (1 to 4 cr.) A course on topics in computing of current interest (in a seminar format, lecture format, lab format or a combination). Offers a wide perspective; accessible to majors and non-majors. May be repeated for credit with a

different topic. (Occasional). Prerequisites: vary with topic.

CSC299 - Independent Study (1 to 15 cr.) Project individually arranged by student and faculty sponsor. Requires completion of the Independent Study form and approval by the Faculty Sponsor, Academic Advisor, Department Chair and Academic Dean. (Fall, Winter, Spring, Summer).

CSC309 - Programming Language: C (1 cr.) Course presents the basics of the C programming language, including compiling and major syntactic features of the language. Topics include arrays, string, pointers and pointer arithmetic, basic system calls, bitwise operations, dynamic allocations of memory, text and binary file I/O, call by value and simulated call by reference, compiling and linking of programs. (Fall). Prerequisite: CSC221.

CSC310 - Perl (1 cr.) Introduction to Perl programming language. Students will design, run, and debug programs. (Fall). Prerequisite: CSC221.

CSC311 - Computer Language (1 to 4 cr.) Introduction to a single high-level programming language or data representation language. Programs in the particular programming language will be designed and run, or tools for processing data represented in the language will be used. May be retaken for credit with a different language. Liberal arts. Prerequisite: CSC221.

CSC312 - Computer Language (1 to 4 cr.) Introduction to a single high-level programming language or data representation language. Programs in the particular programming language will be designed and run, or tools for processing data represented in the language will be used. May be retaken for credit with a different language. Liberal arts. Prerequisite: CSC221.

CSC313 - Computer Language (1 to 4 cr.) Introduction to a single high-level programming language or data representation language. Programs in the particular programming language will be designed and run, or tools for processing data represented in the language will be used. May be retaken for credit with a different language. (Fall). Prerequisite: CSC221.

CSC318 - Discrete Mathematics with Computer Applications II (3 cr.) Using propositional and predicate logic. Proofs, including induction. Recursive definitions. Proving algorithm termination and correctness. Sets. Functions. Relations, including: equivalence relations, partial and linear orders, and closures of relations. Groups, rings, fields, subalgebras and isomorphisms. Liberal arts. (Spring). Prerequisite: CSC217.

CSC319 - Object-Oriented Design and Programming (3 cr.) Object-oriented paradigm, design principles and practice using UML. In-depth study of a modern object-oriented language (currently C++) including dynamic memory allocation, exception handling, event handling, inheritance and templates. Implementation, debugging and profiling using an IDE and a version control system. Prior familiarity with basic data structures or CSC223 recommended. (Spring). Prerequisite: CSC221.

CSC320 - System Administration (1 cr.) Overview of the concepts and techniques of computer system administration. Topics will include system security, user management, system services, configuration management, and scripting. May be repeated for credit with a different operating system. (Fall). Corequisite: CSC119. Prerequisite: CSC221.

CSC321 - Design and Analysis of Algorithms (3 cr.) Course presents general techniques for the design of algorithms. These include divide-and-conquer, dynamic programming, greedy algorithms, and randomized algorithms. Specific algorithms are studied which are drawn from a variety of applications - bioinformatics, scheduling, encryption, graphics, search space. Advanced data structures - graphs, balanced trees - will be studied with applicable algorithms. (Fall). Liberal arts. Prerequisites: CSC223 (grade of C or better).

CSC323 - System Administration Tools (1 cr.) In depth presentation of select system administration tools. Students will learn how to use the tools presented as well as the theoretical and design issues in the area. May be repeated for a total of three credits as topic varies. (Spring). Prerequisite: CSC320.

CSC330 - Human Computer Interaction (3 cr.) Aspects of human-computer interaction will be studied including models of perception, cognition, attention, representation, memory, identity, interaction styles and feedback. The role of information visualization in interfaces will be explored. Students will also learn how to perform empirical studies to evaluate computer interfaces. Liberal arts. (Spring). Prerequisite: CSC121 or CSC122 or CSC221.

CSC333 - Computer Organization (3 cr.) A study of the organization and the structure of hardware components of computers and concepts and techniques of programming in machine assembly language. Emphasis is placed upon the relationships of machine language to computer architecture and higher level languages. Topics include CPU structure, memory hierarchy, and I/O operations. The relationship between user applications, operating systems and computer hardware is discussed. Liberal arts. (Spring). Prerequisite or corequisite: CSC309.

CSC336 - Software Engineering I (3 cr.) This course will provide an introduction to current practices in software engineering. The role of software metrics to manage software projects, evaluate software processes, and track software quality will also be examined. (Fall, Spring). Prerequisite: CSC221.

CSC341 - Introduction to Databases with Web Applications (3 cr.) Designing a database using entity-relationship diagram, implementation of a database and querying in SQL, writing external programs to access the database, languages for creating web pages and writing server side programs to provide dynamic web content from a database. Requires a programming project involving all the topics above. (Spring). Prerequisite: CSC310.

CSC345 - Artificial Intelligence (3 cr.) A survey of procedural and representational techniques used to study or simulate intelligent behavior. The nature of intelligence, machine and human, will be considered. Research developments will be reviewed. Theoretical and ethical limitations will be discussed. A significant programming or writing project will be expected from the student. (Spring). Liberal arts. Prerequisite: CSC221 and CSC217.

CSC352 - Computer Security (3 cr.) A survey of the theory and practice of computer security. Topics will include mandatory and discretionary access control, cryptography, policies, mechanisms, profiles, and threat assessment. (Spring). Prerequisite: CSC221 or equivalent.

CSC357 - Computer Networks (3 cr.) Overview of computer networks with particular

emphasis on the Internet. The layered architecture of the Internet is presented with their related algorithms and current protocols. Security issues are also examined. (Fall). Liberal arts. Prerequisite: CSC221.

CSC372 - Ethics in the Age of Technology and Information (3 cr.) Investigation of the relationship between computers and society in terms of ethical issues such as: personal privacy vs. societal security; intellectual property vs. free speech; dehumanization and loss of autonomy vs. rehumanization; and application of artificial intelligence. Approved AWR. Liberal arts. (Fall/Spring). Prerequisites: ENG101; LIB200; an oral expression general education course; CSC221; junior standing.

CSC383 - Embedded Systems (3 cr.) Introduction to embedded systems programming. Includes configuration of systems, real-time systems, cyber-physical computing, and writing hardware drivers. Liberal arts. (Spring). Prerequisite: CSC309.

CSC399 - Independent Study (1 to 15 cr.) Project individually arranged by student and faculty sponsor. Requires completion of the Independent Study form and approval by the Faculty Sponsor, Academic Advisor, Department Chair and Academic Dean. (Fall, Winter, Spring, Summer).

CSC422 - Theory of Computation (3 cr.) Theoretical foundation of computer science. Considers classes of languages, formal grammars, and automata and the relationships among them. Decidable and undecidable problems. May include topics from recursive function theory or complexity theory. (Fall). Liberal arts. Prerequisite: CSC318 or MAT231.

CSC433 - Operating Systems (3 cr.) The design of systems that manage computer resources (processor, memory, disks and other peripheral devices) in a multitasking environment. Attention to concurrency problems and their solutions. Process and thread scheduling. Strategies for data storage management. Mechanisms that provide system and user security. Approaches to system deadlock. (Fall). Liberal arts. Prerequisites: CSC319, CSC333.

CSC436 - Software Engineering II (3 cr.) This course will instruct students in application of software engineering principles to a medium sized software project. Students will work in teams using an agile software process to gain experience with all aspects of the software development cycle. The topics covered will include personal productivity, customer interaction, team productivity, communication skills, process improvement, and project management in the context of a semester long project. May be taken a second time for credit with a different project topic. (Fall/Spring). Prerequisite: CSC336.

CSC441 - Database Management Systems (3 cr.) Relational database design and implementation. Core topics include: record and file organizations, access structures, entity-relationship model, relational algebra and calculus, relational model functional dependencies and normalization, SQL, database implementation and application programs. Bioinformatics databases and related programming libraries. (Occasional). Liberal arts. Prerequisites: CSC318, CSC223.

CSC442 - Data Mining (3 cr.) The theory, algorithms, and design of data mining and data warehousing systems. The course will cover the whole knowledge discovery process and the use of machine learning in data mining. Liberal arts. (Odd years in Fall). Corequisites: CSC341 or CSC441 or MIS402. Prerequisites: CSC217 or MAT161 or ECO260 or BIO333 or

ENV333.

CSC446 - Software Design Studio (3 cr.) This course will instruct students in application of software engineering principles to a medium sized software project. Students will work in teams using an agile software process to gain experience with all aspects of the software development cycle. Object oriented programming principles and appropriate data structures will be applied in the context of a semester long software project. (Fall, Spring). Liberal arts. Prerequisites: CSC336 and CSC223 (grade of C or better).

CSC452 - Threat Analysis and Modeling (3 cr.) Identification, analysis, and modeling of security threats in computer applications, systems, and networks. Topics will include protocol design and analysis and configuration management. (Odd Years in Spring). Liberal arts. Prerequisites: CSC330 or CSC336 or CSC341 or CSC441, and CSC352.

CSC456 - Reliable Systems (3 cr.) The process of building high assurance systems and techniques for fault detection and recovery. System reliability will be discussed at the hardware, middleware, and application level. (Even Years in Fall). Liberal arts. Prerequisites: CSC223, CSC336.

CSC462 - Intrusion Detection (3 cr.) The defense in depth approach to network security, with a focus on the role of intrusion detection systems. Techniques of identifying, modeling, and reacting to unauthorized activity will be covered. Liberal arts. (Spring even years). Prerequisites: CSC352, CSC357.

CSC480 - Image Processing (3 cr.) An introduction to the representation, analysis, and processing of digital images. Topics covered will include image transformations, statistical description of images, image enhancement, image restoration, image segmentation and edge detection, and image processing for multispectral images. Liberal arts. (Fall even years). Prerequisites: MAT202, CSC217, CSC309.

CSC485 - Advanced Topics in Computing (1 to 4 cr.) A course on topics in computing of current interest (in a seminar format, lecture format, lab format or a combination). May be repeated for credit with a different topic. Liberal arts. (Occasional). Prerequisites: vary with topic.

CSC495 - Undergraduate Research (2 to 6 cr.) Research project individually arranged between student and faculty member. May be repeated for credit. (Fall, Winter, Spring, Summer). Liberal arts. Prerequisite: POI.

CSC496 - Instructional Practicum (1 to 2 cr.) Designed for students who will work under the supervision of a faculty member to assist in the instruction of a course. A contract specifying the responsibilities of each student will be filed in the department. May be taken twice for a total of six credits with chairperson's permission. (Fall/Spring). Prerequisite: POI.

CSC497 - Computing Practicum (1 to 3 cr.) Participate in software development, system administration, or other applied computing experiences within the Computer Science Department. May be taken twice for a total of six credits. (Fall/Winter/Spring/Summer). Prerequisites: six credits in upper level CSC courses.

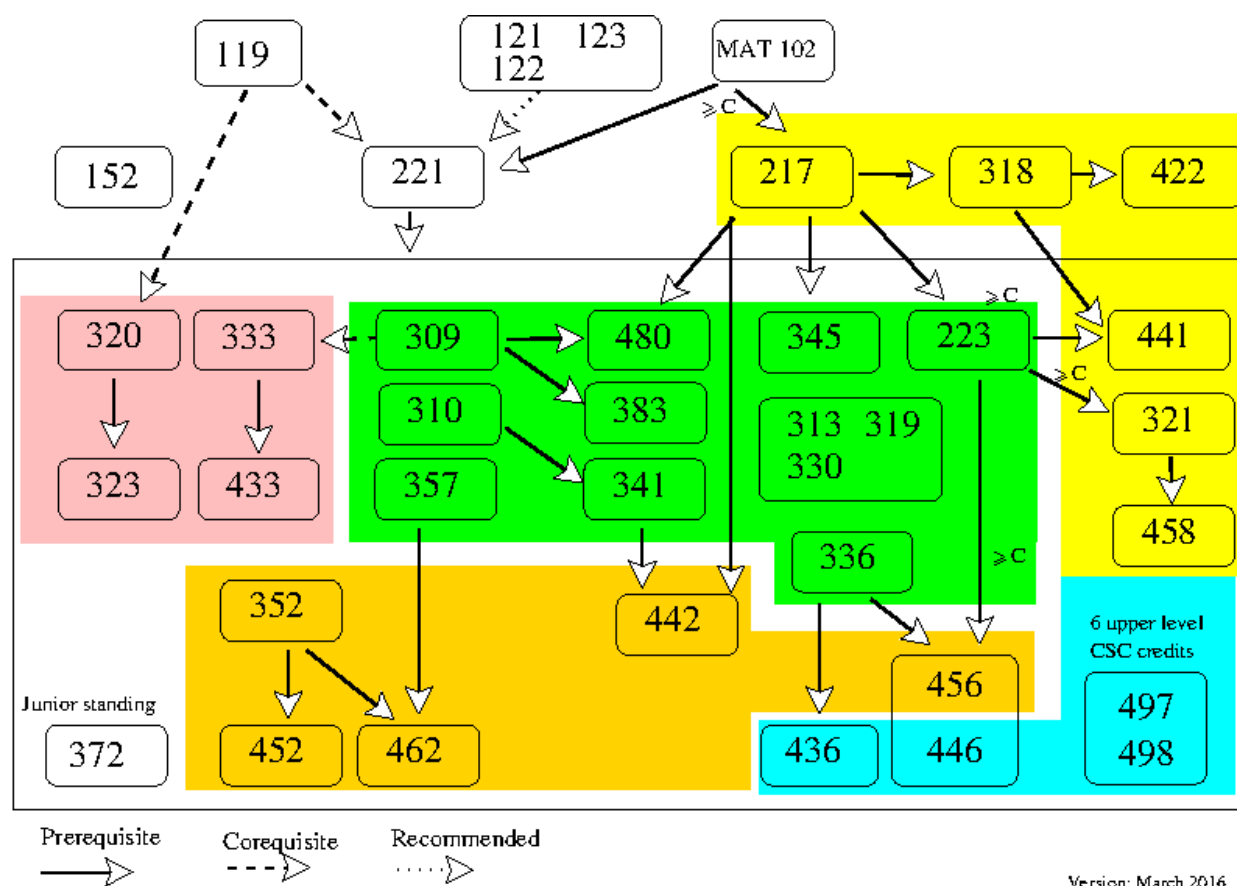
CSC498 - Internship in Computer Science (1 to 15 cr.) Computer science activity at an industrial or research facility. (Fall, Winter, Spring, Summer). Prerequisite: six credits in upper

level CSC courses and department chair approval.

CSC499 - Independent Study (1 to 15 cr.) Project individually arranged by student and faculty sponsor. Requires completion of the Independent Study form and approval by the Faculty Sponsor, Academic Advisor, Department Chair and Academic Dean. (Fall, Winter, Spring, Summer).

CSC599 - Independent Study (3 cr.) Project individually arranged by student and faculty sponsor. Requires completion of the Independent Study form and approval by the Faculty Sponsor, Academic Advisor, Department Chair and Academic Dean.

CSC Course Prerequisites



NOTE. All the courses in the box below CSC 221 require this course as a pre-requisite; Also, taking CSC 119 is required or strongly recommended before taking these courses. A "corequisite for course X" is a course that needs to be taken either before or together with X. The graph shows dependencies in a simplified manner. Please see CSC course descriptions for the exact prerequisites.

Projections of Course Offerings (Tentative)

No.	Cr.	Course	Frequency	F17	S18	F18	S19
csc119	1	Introduction to UNIX/Linux prereq.: none	fall, spring winter on-line?	•	•	•	•
csc121	3	Introduction to Computing and the Web prereq.: none.	fall, spring, sum., winter on-line	•	•	•	•
csc122	3	Physical Computing prereq.: none.	fall	•		•	
csc123	3	Scientific Simulation and Modeling (GenEd:5NST) prereq.: none.	occasional	?			
csc152	3	Computer Security and Society prereq.: none.	fall	•		•	
csc217	3	Discrete Math with Computer Applications I (GenEd:5MAT) prereq.: grade \geq C in mat102 Precalculus.	fall, spring	•	•	•	•
csc221	3	Introduction to Programming (in Python) Coreq.: Linux or csc119. prereq.: grade \geq C in mat102, programming or csc121/122/123.	fall, spring	•	•	•	•
csc223	3	Data Structures and Algorithms prereq.: csc217 and grade \geq C in csc221.	fall?, spring	•	•	•	•
csc285	3	Topics in Computing (topic varies with offering) prereq.: vary. (May be repeated with a different topic.)	fall, spring	SQL adminr	•	•	•
csc309	1	Programming Language C prereq.: csc221.	fall, spring?	•	?	•	•
csc310	1	Perl prereq.: csc221.	fall	•	?	•	•
csc311	1	Computer Language (language varies with offering) prereq.: csc221. (May be repeated with a different language.)	fall, spring?	Intro Java	?	•	?
csc312	2	Computer Language (language varies with offering) prereq.: Intro Java. (follows csc311)	fall, spring?	Adv. Java			
csc318	3	Discrete Math with Computer Applications II prereq.: csc217.	spring	•	•	?	•
csc319	3	Object-Oriented Design and Programming (with C++) prereq.: csc221.	spring	•	•	?	•
csc320	1	System Administration prereq.: csc221. Coreq.: csc119. (May be repeated with a different OS.)	fall, spring?	Win	?	•	?
csc321	3	Design and Analysis of Algorithms prereq.: grade \geq C in csc223.	fall, some springs	•	?	•	
csc323	1	System Administration Tools (topic varies with offering) prereq.: csc320. (May be repeated with different topic.)	fall?, spring	Activ Dir	•	?	•
csc330	3	Human-Computer Interaction prereq.: csc121 or csc122 or csc221.	spring		•		•
csc333	3	Computer Organization prereq. or coreq.: csc309 or old csc319 - ask your CSC advisor.	spring	•	•	?	•
csc336	3	Software Engineering I prereq.: csc221.	fall, spring	•	•	•	•
csc341	3	Intro. to Databases with Web Applications (with SQL) prereq.: csc310.	spring		•		•
csc441	3	Database Management Systems (with SQL) prereq.: csc318 (or mat231), and csc223.	depends on demand			•	
csc345	3	Artificial Intelligence prereq.: csc221 and csc217.	spring		•		•
csc352	3	Computer Security prereq.: csc221.	fall?, spring	•	•	?	•
csc357	3	Computer Networks prereq.: csc221.	fall, spring?	•	•	•	•
csc372	3	Ethics in the Age of Tech/Information (AWR) prereq.: junior standing, csc221, eng101, lib200, Oral Expr. GenEd.	fall, spring	•	•	•	•
csc422	3	Theory of Computation prereq.: csc318 or mat231.	fall, some springs	•	?	•	
csc433	3	Operating Systems prereq.: csc309 or old csc319 or old csc333 - ask your advisor.	fall, some springs	•	?	•	
csc436	3	Software Engineering II (project varies with offering) prereq.: csc336. (May be taken a second time for credit.)	fall, spring	•	•	•	•
csc446	3	Software Eng. Studio (project varies with offering) prereq.: csc336 and grade \geq C in csc223.	fall, spring	•	•	•	•

csc442	3	Data Mining prereq.: csc217 or mat161 or Statistics. Coreq.: csc341/441 or mis402.	odd years in fall	•				
csc452	3	Threat Analysis and Modeling prereq.: csc352	odd years in spring					•
csc456	3	Reliable Systems prereq.: csc223, csc336.	even years in fall				•	
csc462	3	Intrusion Detection prereq.: csc352 and csc357.	even years in spring		•			
csc485	3	Advanced Topics in Computing (topic varies with offering) prereq.: vary. (May be repeated with a different topic.)	depends on demand	?	•	•	•	•
csc496	1-2	Teaching Assistantship (ask Dept. Chair, Dr. Plaza.) prereq.: permission of the instructor. (May be repeated.)	fall, spring	•	•	•	•	•
csc497	3	Computing Practicum (topic varies with offering; ask Dr. Hart.) prereq.: 6 credits in upper level CSC courses.	fall, spring, summer, winter	•	•	•	•	•
csc498	3	Internship (topic varies with offering; ask Dr. Hart.) prereq.: 6 credits in upper level CSC courses.	fall, spring, summer, winter	•	•	•	•	•

NOTES

- **No.** — Course numbers are in increasing order, except that CSC441 is right after CSC341 (because they are both database courses).
- **Cr.** — number of credits.
- **Course**
 - "GenEd" is followed by the denotation of a General Education category the course belongs to.
 - "AWR" marks a course that satisfies the Advanced Writing Requirement.
 - Depending on the availability of faculty and qualifications of the student, csc199/299/399/499 **Independent Study** (1-15 cr.) and csc495 **Undergraduate Research** (2-6 cr.) may be offered any semester, including summer and winter. They may count as electives or replace required courses.
 - Also the following elective courses are offered during some fall or spring semesters, depending on demand:
csc123 Simulation and Modeling,
csc314 Non-Imperative Programming,
csc383 Embedded Systems,
csc437 Theory and Implementation of Programming Languages,
csc445 Knowledge Representation and Inference,
csc451 Computer Graphics,
csc453 Numerical Methods,
 - Gray highlighting — prerequisites other than csc119, csc217, csc221.
- **Frequency** frequency of offerings of some courses depends on demand. Please help the department choose which courses to offer — talk with computer science faculty about your interests.
- **F16** — Fall semester 2016, **S17** — Spring semester 2017, etc.

Academic Advising: How to Select Courses

Selecting classes each semester is one of the most important decisions you will make at college. You will make these choices in consultation with your faculty adviser. Prior to the meeting with your adviser, at the midpoint of each semester during the Advising Period,

there are several things you should consider.

Degree Works report. Login to MyPlattsburgh and navigate to DegreeWorks. The report shows completed requirements and those which are still outstanding. **Review your report prior to meeting with your adviser.**

Course balance. Generally, a well-balanced course load includes both technical courses (computing, mathematics, science) and humanities gen ed courses with reading and writing.

Plan your load. The average load students take is 15 credits per semester (for instance five 3-credit courses); with such a load you can complete the 120-credit college requirement and graduate in eight semesters (four years). 12 credits are required in order to maintain the full-time status. Any load bigger than 18 credits is considered heavy and requires a 3.0 or higher cumulative GPA, filling out an Authorization to Register for Credit Hour Overload form, permission from the department chair, and approval by the dean.

Requirements of state and federal financial aid Notice that state and federal financial aid will pay for only 120 credits and require every semester 12 credits in courses strictly necessary for the degree. (Credits required for additional majors and minors only count towards financial aid up to the 120 total credits required for graduation.) Consult the Office of Financial Aid.

Summer and winter sessions. If you wish to graduate sooner than four years, you can take courses during summer and winter sessions. CSC 121 *Introduction to Computing and the Web* and many Gen-Ed courses and math courses are available during these sessions. CSC 497/498 *Internship* may also be available. Notice however that other CSC courses are not offered during these sessions.

Fundamental CSC courses. **Take the following courses during the freshman year or as early as possible** — they are prerequisites for all other CSC courses.

- CSC 119 (1 cr.) *Introduction to UNIX/Linux* — Required for both IT and CS; this course will make you a comfortable user of UNIX/Linux computers. It takes the first five weeks of the semester, and it can be taken concurrently with courses in which students work in the Linux environment.
- CSC 121 (3 cr.) *Introduction to Computing and the Web* or CSC 122 (3 cr.) *Physical Computing* or CSC 123 (3 cr.) *Simulation and Modeling* — CSC 121 or CSC 122 needs to be taken by all IT majors, and any of these courses by CS and SEC majors who have not had exposure to computer programming, so that they can later take CSC 221.
- CSC 217 (3 cr.) *Discrete Math with Computer Applications* — Required for both IT and CS. Notice that it has a prerequisite of MAT 102 *Pre-calculus*, so you may need to take that first.
- CSC 221 (3 cr.) *Introduction to Programming (in Python)* — Required for both IT and CS. This is the core course for CS and IT — mastering its material is essential for your success. If you have not encountered computer programming before, it is recommended that you first take CSC 121 or CSC 123.

Plan ahead. Since not all courses are taught each semester, it is a good idea to plan when you will take each required course so that you can complete prerequisite courses in

time. Use Projections of CSC Course Offerings together with your DegreeWorks report to make a plan for the rest of your studies.

Placement and proficiency exams. Placement exams are offered in English and Math — If you take these exams, you will be placed in a course at an appropriate level. If you have knowledge equivalent to MAT 102 Precalculus, take Calculus Readiness Test (MAT 102 or passign this test is a prerequisite for core CSC courses. There is a proficiency exam in Library Skills — you can take this exam to test out of LIB 200. There is also a foreign language exam that will place you at an appropriate level or out of the requirement.

Learning skills courses. Complete the following required GenEd courses during the freshman year or as early as possible:

- ENG 101 (3 cr.) — Writing ability is critical. Freshmen will take a writing exam during orientation and will be placed in either ENG 100 or ENG 101 based on this exam.
- CMM 101 (3 cr.) — Our graduates tell us that public presentations and communication within a work group are always a part of their professional work. COM101 gives you practice in public speaking. You will continue to develop this skill in some of upper division CSC courses.
- LIB 200 (1 cr.) — Learn to use current tools to find information. The course can be taken on-line or in a classroom. Alternatively, you can study on your own and take the LIB Proficiency Exam.

How many more semesters before graduating? Work with your DegreeWorks report.

- Look up *Cumulative Credits* in your Degree Works report. Determine how many more are needed to complete the 120 credits required for graduation.
- Look up *Upper Level Credits* in your Degree Works report. Determine how many more are needed to complete the 45 credits required for graduation.
- Look up your major(s), minor(s) (if any) and GenEd requirements in the Degree Works report. Determine how many more credits are needed to complete their requirements.

Take the biggest of the numbers above; If you are taking 15 credits per semester, divide it by 15 — you need at least that many semesters.

BS or BA? In the case of computing disciplines, Bachelor of Science degree (BS) is more respected by employers than Bachelor of Arts (BA). The same concerns graduate school admissions. Consider switching to the BS version of your major — this will require only 10-12 more credits in upper level elective CSC courses. A BA version of a computing major is recommended only in the student has two majors or is under time constraints which do not allow completing additional electives for the BS degree.

CS, IT or SEC minor. Consider a minor to strengthen your degree. Some students declare multiple minors. In the case of CS, IT and SEC minors, about 6 credits will double-count towards the major and the minor. To declare a minor fill out Declaration or Change of Major/Minor/Advisor Form and give it to the Chair of the Department.

Interdisciplinary minors in Bioinformatics, Robotics and Web Design. If you have interest in biology, you can enhance your Computer Science major with a Bioinformatics

minor. Robotics involves physics courses. If you like art or writing you can declare Web Design and Programming Minor that involves courses from Art, Communication and Journalism departments, among others.

Math courses. Math is useful in computer science, although substantially less math is needed in IT. If you like math, consider taking the math minor. Due to a big overlap in requirements between this minor and the Computer Science Major, you can complete Math Minor by taking just 7 additional credits. We recommend the following MAT courses.

- MAT 224 (4cr) instead of the weaker version MAT 221 (3cr).
- MAT 225 (4cr) *Calculus II*, instead of the weaker version MAT 222 (3cr).
- MAT 202 *Linear Algebra I* (this has a prerequisite of MAT 224.) Recommended for CSC 451 *Computer Graphics*.
- MAT 326 *Calculus III* (this has a prerequisite of MAT 225.) Recommended (but not required) for CSC 451 *Computer Graphics*.
- MAT 161 *Introductory Statistics*.
- MAT 361 *Probability and Statistics* (prerequisite: MAT 326.) This course provides tools for analysis of time and space complexity of algorithms, the behavior of data flow through networks, and a foundation of queuing theory. This course is strongly recommended if you plan to study computing at a graduate level.

Natural science courses. We recommend that you take either physics or biology or chemistry to meet your General Education Natural Science requirement. Physics is recommended for students interested in low level computing, embedded systems or robotics; PHY 111 is a prerequisite for PHY 379 *Introductory Robotics*; If you complete PHY112 you will have the prerequisite for advanced courses such as PHY350 *Circuits and Electronics* and PHY365 *Electronics for Scientists* which relate to computer hardware engineering. Bioinformatics applies computer science to problems of genome mapping with information retrieval and protein and enzyme modeling; completing BIO 101 or CHE 112 you will give you one of the prerequisites for BIO 341 *DNA and Bioinformatics*.

Foreign languages. Knowing a foreign language can help you get a better job and will be useful in your career. Even if the Gen-Ed program allows you to fulfill the requirement by taking a course on World Systems instead of a language course, consider what is most useful for your career. We recommend completing a foreign language course.

College electives. The college requires 120 credits for an undergraduate degree. Fulfilling all the CS, IT or SEC major requirements and Gen-Ed requirements will give you only about 90 credits. To make up the difference consider taking CSC courses towards an additional minor. Minors offered by the Computer Science Department allow a 33 percent credit overlap with the majors, so you can get such a minor for, say, 12 credits, instead of 18.

Upper level credit requirement. In your DegreeWorks report you will find information on how many upper level (300- or 400-level) credits you have accumulated out of the 45 required for graduation.

Apply for the diploma. In your senior year, right after registering for courses for your final semester, fill out the Diploma Application Form on-line. The Registrar will then check your academic records to determine if you satisfied all requirements for graduation, and will

notify you about the conclusion. Do not delay the application for the diploma — if there is any requirement you missed and/or any error on the DegreeWorks report, you need to learn about it when there is still time to fulfill the requirement.

Plan your schedule to allow for extracurricular activities. Every week CS, IT and SEC students, faculty and other interested persons meet for Video and Discussion.

Consider going to a graduate school. Additional career possibilities become available if you complete a graduate degree. The CS major with Mathematics Minor will prepare you for graduate studies in any computer-related area. Our alumni who have gone on to graduate studies in computing tell us that it is useful to complete an advanced probability and statistics course, such as MAT 361 (prereq: Calculus III). In most cases you can take such a course in graduate school, but you may prefer to take it in advance.

Distinguish Yourself

Scholarships, many forms of financial aid, teaching assistantships, sponsored undergraduate summer research programs, internships, graduate school admissions and jobs are all competitive. To increase your chances you need to distinguish yourself in some of the following categories:

- Depth of computer-related knowledge
- Breadth of computer-related knowledge
- Interdisciplinary knowledge
- Excellence
- Problem solving skills
- Communication skills
- Service
- Leadership

Every semester many CS, SEC and IT majors are placed on the dean's list. We regularly have Cum Laude, Magna Cum Laude and Summa Cum Laude graduates. Many of our students declare a minor or two, some have a double major, some participate in the Honors Program and graduate with the Honors Medallion. Recently we have had students accepted in graduate programs at top universities, including Oxford and Cornell — with merit scholarships or assistantships. Several of our juniors and seniors have participated in undergraduate research programs around the country — greatly enhancing their personal learning experience and their ability to compete in the job market following graduation.

Set high goals for yourself when you are a freshman — when there is still time to accomplish them before graduation. Consider the following — any of these items would be worth mentioning on your job or graduate school application. Talk to your academic adviser — all Computer Science faculty will be happy to assist you in achieving excellence and professional success.

- Declare a minor or a second major;
- Take CSC courses beyond the requirements of your major (what counts most in your career is the actual knowledge and skills);
- If you have a cumulative GPA of 3.5 or higher, apply to the Honors Program,

- complete General or Advanced Honors to graduate with an Honors Medallion;
 - do an Advanced Honors Project — write an undergraduate thesis;
- Prepare for and take part in intercollegiate programming contests;
- Choose topics and lead discussions at the Video and Discussion hour;
- Become a teaching assistant (TA);
- Become a tutor at the Learning Center helping others with CSC courses;
- Become an Orientation Leader or a Student Ambassador,
- Apply to summer programs of Research Experience for Undergraduates (REU);
- While in your junior or senior year ask faculty members about possibilities of independent study (CSC399/499) or undergraduate research (CSC495); work on a conference presentation or a publication;
- Take graduate CSC courses when you are within 15 credits of your undergraduate degree;
- Apply for internships with major government agencies, leading academic institutions and international corporations, using resources of the Career Development Center;
- Aspire to awards given by the Computer Science Department. All CS, SEC and IT majors at the junior and senior level are considered for these awards without an application. GPA in the major and leadership among CS&IT students are the main criteria:
 - Hudson Scholarship (for juniors),
 - Academic Excellence Award,
 - Outstanding Achievement Award, (for instance to recognize undergraduate research and achievement in programming contests),
 - Leadership Award — to recognize activities in support of the computer science and information technology community, such as leadership in student activities related to computing,
 - Outstanding Graduate Award;
- Apply for SUNY Plattsburgh Presidential Scholarship and SUNY Chancellor Awards;
- Apply for CAS Student Academic Travel Grants to travel to professional conferences where you present a poster, and to programming contests;
- Keep your GPA up
 - to be placed on Dean's List every semester (semester GPA of 3.5 or higher required),
 - to become invited to Phi Kappa Phi Honor Society, SUNY Plattsburgh's Chapter that recognizes academic excellence (for juniors and seniors with a GPA in the top 5-10%),
 - to graduate Cum Laude (GPA 3.4), Magna Cum Laude (GPA 3.7), or Summa Cum Laude (GPA 3.9).
- Join the Student Association;
- Aspire to be the commencement student speaker at your graduation;
- Engage in undergraduate research and prepare poster presentations for the Student Research Symposium (held every April at our college). Participate in other activities of Sigma Xi Scientific Research Society, SUNY Plattsburgh Chapter.

Internships

Internships provide valuable work experience prior to graduation and allow students to establish future employment contacts. Employers say that internships are essential for any serious job applicant. The internship program is an opportunity for you to gain practical experience and technical skills in an area of computing that interests you. Our student interns typically work in the same roles in which they would work after graduation:

- Software developer or computer programmer:
 - system programmer
 - network programmer
 - web programmer
 - graphic user interface programmer
- Computer hardware or network technician
- Administrator:
 - system administrator
 - network administrator
 - database administrator
 - web-server administrator

CSC 497 Computing Practicum concerns maintaining departmental servers and computer network. Other on-campus internships are available through CSC 498 Internship at Computing and Media Services or Computer Information Systems Department. Off-campus internships are offered by many companies and government agencies. See Dr. Delbert Hart in our department to get started. If you are interested in off-campus internships, consult the Career Development Center on campus. Persons on a student visa should consult with International Student Services about participating in an off-campus internship.

It is essential to plan and prepare early in your college career for the kind of experience you desire. Contact the Career Development Center and Dr. Hart to learn more about knowledge and skills that will be useful.

Internships are competitive and are limited to students who have at least 6 credits in upper level CSC courses. The internship proposal form must be approved by the Computer Science Department and students must be registered for CSC498 before starting an internship. An internship is typically taken for 3 credits. The campus policy requires at least 45 hours of effort per credit.

What Do Our Interns Say About Their Internships?

Ugo Iromantu: My internship opened doors to professional software development. During my final semester at Plattsburgh State, I worked as an Intern at Nexnevo Consulting, Inc. At Nexnevo, I helped develop ASP.NET Web Applications and Enterprise XML Web Services. This afforded me the opportunity to apply much of the knowledge I had gained at Plattsburgh State and also opened a door to professional software development with modern technology. Needless to say, working at Nexnevo was a very fulfilling experience.

Chris Arena: I set up a Book Exchange website for our Student Association so that students could buy and sell their used textbooks directly to one another. This involved building a content-driven website (like Amazon.com).

Teaching Assistantships

Teaching assistantships are provided through CSC496 *Instructional Practicum*. They count towards electives in any major in the department. Students who are interested in being a Teaching Assistant (TA) for a particular course can talk to the instructor and, if approved, enroll in CSC496 (1-2 cr.) You can take up to 6 credits of TA-ships during your studies. A TA-ship for the same course may be repeated a second and third time with the approval of the department chair. TA's work 45 hours per credit. Duties include tutoring and performing course material reviews during specially scheduled sessions, helping students during computer lab sessions scheduled as part of the course, providing feedback on student's work and assisting instructors in preparation of course materials. The college policy does not allow TA's to assign grades. TA-ships are competitive. To be considered for a TA-ship for a particular course the student must have completed the same course with an A or demonstrate in another way high proficiency in the course subject matter. Also, maturity, reliability and good communication skills are required.

Computing Services and Facilities

Single username and password. Every student at SUNY Plattsburgh receives a username and chooses a password. The same username and password are used for most computing services on campus, including login to the computers in the Feinberg main lab, CSC Computer Lab and CSC Student Project Room, remote logins to the departmental Linux servers, campus email, campus information services (MyPlattsburgh, Banner, Degree Works) and course management system (Moodle).

CSC Computer Lab — Au Sable 113. This lab has 30 Linux computers and a high-speed laser printer. Students are provided with accounts and network file storage in a Linux environment. A user will have the same environment and will have access to the same directories and files independently of which lab machine is used. The lab is used for both instruction and for individual work of the students.

CSC Student Project Room — Au Sable 309. This lab has eight Linux workstations. It is adjacent to faculty offices so that students can ask for feedback when they work on programming. It can be used by individual students or by teams to develop joint projects. Every machine gives access to the same environment and the same user directories and files as the machines in the CSC Computer Lab. Books on programming, Linux, etc. are available.

CSC Student Commons — Au Sable, 3rd floor, in the CSC Department Suite. Study groups can use whiteboards, and a big screen that can mirror your laptop's screen. Some

books are available. Of course, the Commons are also a good place to rest between classes.

Study Rooms. Several Study Rooms in the Au Sable Building can be used by groups of students to conduct discussions or tutoring, and for faculty and student meetings. A room can accommodate 6 people. A whiteboard is available. Study rooms need to be reserved by contacting Ms. Alexis Akey, in Au Sable 223, or by calling (518) 564-4186.

Feinberg Computer Labs. These labs are located in the Feinberg Library Building. They contain Windows computers and are used for individual work by all college students. Putty (ssh), FileZilla (sftp) and Xming (X-server software) are installed to facilitate access to the Computer Science Department's Linux servers. Also, Python 3 and Idle 3 are installed. For detailed hours and listing of the available software please see the lab webpage.

Remote access to the CSC Linux server. Students who have accounts in the CSC Computer Lab can connect with ssh and sftp from both on-campus and off-campus computers (running any operating system) to the departmental Linux server, student.cs.plattsburgh.edu. The server gives access to the same user directories and files as the machines in the CSC Computer Lab. For users who run Windows on their computers, we recommend Putty (ssh) for interactive work on the servers, and WinSCP or FileZilla (sftp) to transfer files; If you install Xming (X-server software), you can run graphic software from the server. If you use a Macintosh, you can invoke ssh from the command line in Terminal (included with the operating system in Applications/Utilities.); To facilitate easy file transfers download Cyberduck or Fugu; if you wish to use an X-server download XQuartz.

CSC Student Wiki. Student wiki provides information on topics of Video and Discussion, opportunities in Research Experience for Undergraduates (REU), software help, student activities, etc.

Web hosting. Students can create own websites at <http://student.plattsburgh.edu>. (In various CSC courses, construction of web pages is practiced on departmental computers.)

Computer help. Questions about departmental Linux computers can be directed to your instructor; any unresolved problems should be reported to Dr. Hart. Computing and Media Services Department maintains computers used by the college for academic purposes, except CSC facilities. For help with Windows or Macintosh software or hardware on campus please call the Helpdesk at 564-4433. You may also contact them about other technology services:

- **Wireless Network** is available in all buildings and in many outside locations on campus.
- **Cardinal Computer Care** provides low cost repairs of privately owned computers.
- **Resnet** provides networking in residential halls.
- Technology Enhanced Learning Workshops.
- Advice on what to look for when buying a computer.

Video and Discussion

During the fall and spring semesters, every Tuesday at 12:30 we invite students, faculty and all interested members of the community to watch together and discuss videos **on topics of natural science, math, computing, engineering and related social and philosophical issues**, and to share pizza. Participants choose topics or particular videos. For the detailed program please visit CS&IT Student Wiki. This is a free weekly event open to the public. Feel free to share this information with all interested persons.

Beginnings of the Computer Science Department, SUNY Plattsburgh, College of Arts and Science

as remembered by Julius A. Archibald, Jr., Professor Emeritus

In the late 1960's, Dr. Harold J. Perkins, Dean of the Faculty of Science and Mathematics at that time, was approached by concerned members of the faculty, led by Dr. George F. Sheats of the Department of Chemistry and Dr. Paul P. Szydluk of the Department of Physics and Earth Science, with a recommendation that instruction in digital electronic computation (i.e., computer science) be offered at Plattsburgh. Their rationale was that the offering of such instruction was needed not only as a complement to the existing programs in chemistry and physics, but also, and more importantly, to maintain the currency of the overall academic programs of the college. Dr. Perkins was convinced by these arguments.

There was also interest elsewhere on campus, from the Department of Biological Sciences and the Department of Mathematics in the Faculty of Science and Mathematics, from the Department of Business and Economics in the Faculty of Social Sciences, and from the Department of Education in the Faculty of Professional Studies. A decision was made not to offer computer science instruction through the Department of Mathematics. It was for this reason that Dr. Perkins found it necessary to create an independent Department of Computer Science. He invited the original petitioners, all of whom were full-time faculty members and many of whom were tenured, to serve as part-time members of the new department as a part of their overall commitment to the college, with Dr. Sheats (a former chair of the Department of Chemistry) as the chair. This happened during the 1969-1970 academic year.

The first instruction offered by the new Department of Computer Science occurred in the spring of 1970. It was course CSC350 (FORTRAN Programming) offered in a lecture-recitation format. The lecturer was a part-time visiting instructor from Montreal, with two recitation sections being handled by Drs. Sheats and Szydluk. Whether or not there was actual

computer support at that time, using the small IBM 1440 computer operated by the college administration, is unknown to this writer.

During the spring and summer of 1970, this writer (a mathematician by training and a computational scientist with the General Electric Company) and Dr. Meyer Katzper (a physicist and computational scientist with industry) were recruited to serve as full-time members of the new Department of Computer Science with responsibilities for the total instructional program. Instruction was offered "in-house" in the fall of 1970, in both CSC350 (two lecture sections, both with additional recitation sections) and CSC470 (Numerical Methods), with computer support on the IBM 1440. The faculty members from other departments, originally appointed to the department on a part-time basis by Dr. Perkins (including Dr. Sheats as chair), continued to serve in those capacities, thereby making it possible for the internal administrative responsibilities usually associated with independent academic departments to take place. Dr. Katzper returned to private industry in 1973. Dr. Sheats remained as chair through the 1973-1974 academic year, at which time the chair was assumed by this writer.

It is this writer's recollection that computer science was first approved as a major during the 1973-1974 academic year, with the first majors who already accumulated a number of computer science courses, graduating in 1974. Over the last 40 years the department has prepared thousands of students for careers in computer science and information technology.

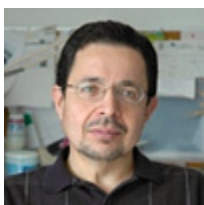
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Contact Information

Computer Science Department

We will be glad to answer your questions about academic programs in Bioinformatics, Computer Science, Computer Security, Information Technology, Robotics, and Web Design and Programming, and also questions on transfers of computer related courses, internships, etc.

Phones, fax, URL, e-mail

(518) 564-2788 (phone)

(800) 256-6796 (toll-free phone)

(518) 564-2768 (fax)

<http://www.cs.plattsburgh.edu/~plazaja/department/> (URL)

csc@plattsburgh.edu (email, secretary)

Mailing address

SUNY Plattsburgh

Computer Science Department

101 Broad Street

Plattsburgh, NY 12901

Location on campus

Au Sable Building: Room 306 - Secretary; Room 307 - Department Chair
next to Hawkins Hall, on the corner of Cornelia Street and Draper Avenue

Admissions Office

Open

Monday-Friday, 8:00 a.m. - 4:30 p.m. (Eastern Standard Time)

Location on campus: 10th floor of the Kehoe Building.

Phones, fax, URL and email

(518) 564-2040 (phone)

(888) 673-0012 (toll-free phone)

(518) 564-2045 (fax)

<http://web.plattsburgh.edu/admissions/apply.php> (URL)

admissions@plattsburgh.edu (email)

Mailing address

Carrie Woodward, Director of Admissions

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Plattsburgh, NY 12901



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