Degrees offered in computing at The Ohio State University are featured in this brochure.

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Introduction

The purpose of this brochure is to describe the various baccalaureate-level computing degree programs offered through the CSE Department, as well as additional degrees offered through other departments and colleges that have a strong computing component. These options allow students to explore established career options or newly emerging fields they discover to be of interest to them as they progress through the program.

The dynamic and rapidly evolving field of computing is an area of study that encompasses a broad spectrum of theoretical and practical topics. Typical subjects of study include: design and analysis of algorithms and data structures; principles of programming language design; system software design; organization of computer hardware; computer networks; operating system principles; software engineering; databases and file design; artificial intelligence; numerical computation; computer graphics; network security and the theoretical foundations of computing.

The field of computing involves a broad spectrum of other fields of knowledge, and there are a variety of approaches to studying computing. In recognition of this situation, the CSE Department offers undergraduate major and minor programs through two different colleges: the College of Engineering and the College of Arts and Sciences.

The different undergraduate programs cater to the different interests of students. The BS programs from the College of Engineering (BS CSE) and the College of the Arts and Sciences (BS CIS) prepare computing students for employment in the computing profession and for graduate study in computer science. The BA in Arts and Sciences (BA CIS) prepares CS students to use computers effectively in other fields to which computers can be applied, allowing the opportunity to combine the study of computer science with study in a related field.

Two other programs that have a strong computing component are the BS ECE (Computer option) offered in the Electrical & Computer Engineering Department (College of Engineering), and the BSBA (Information Systems option) in the Fisher College of Business. The BS ECE program offers students a solid grounding in electrical engineering and computer hardware. The BSBA program prepares students to use computers effectively in business emphasizing techniques of particular interest to commercial computing, while providing a strong background in business. Students in both programs are required to take a range of core CSE classes, ensuring that they have a solid background in computing fundamentals.

Students who are pursuing other degree programs and who have strong interest in computing may want to consider a minor in CIS. The requirements for a CIS Minor are also described in this brochure.
In order to ensure that majors will be able to complete their programs expeditiously, the Department gives scheduling priority in upper-division courses to CSE & CIS majors. All students in Engineering and Arts and Sciences who wish to become majors must apply for formal acceptance into the Department and will be admitted to the respective majors upon completion of the prerequisites outlined below.

**The prerequisites for the CSE major (BS CSE) in Engineering are:**

1. Completion of Engr 1100.xx.
2. Completion of Math 1151.
3. Completion of CSE 2221.
4. Completion of Physics 1250.
5. Completion of Engr 1181 and 1182.
7. At least 15 credit hours earned at Ohio State.
8. An MPHR, over CSE courses that can be included in the major program, of at least 2.0.
9. A CPHR that is adjusted once each year, according to an enrollment management scheme. Through Spring '13, the CPHR requirement is 2.5. The CPHR requirement will become 3.0 effective May 2014.

**The prerequisites for the CIS major (BS CIS, BA CIS) in Arts and Sciences are:**

1. Completion of ASC/NMS 1100.xx.
2. Completion of Math 1151.
3. Completion of CSE 2221.
4. Completion of Physics 1250 (only for BS CIS).
5. Completion of English 1110.xx.
6. At least 15 credit hours earned at Ohio State.
7. An MPHR, over CSE courses that can be included in the major program, of at least 2.0.
8. A CPHR that is adjusted once each year, according to an enrollment management scheme. Through Spring '13, the CPHR requirement is 2.5. The CPHR requirement will become 3.0 effective May 2014.

Application to Major forms are available in the CSE undergraduate advising office in room 374 Dreese Laboratories and should be submitted during the semester in which the above requirements will be met.

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### Additional Majors

#### BSBA (Information Systems)

The Fisher College of Business has similar competitive admissions standards for the Information Systems specialization. Please contact the College advisors in 120 Schoenbaum Hall for additional information about the curriculum and admission to major. [http://fisher.osu.edu](http://fisher.osu.edu)

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#### BS ECE (Electrical & Computer Engineering, Computer Specialization)

The BS ECE is a comprehensive Electrical & Computer Engineering degree. The program is a balanced study of hardware and software as applied to practical computer systems. Please consult with the Electrical & Computer Engineering Department in 205 Dreese Labs for additional information about curriculum and admission to major. [http://www.ece.osu.edu](http://www.ece.osu.edu)

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### Scheduling Priorities

BS ECE (Computer Engineering Specialization) majors and BSBA (Information Systems) majors will be given the same priority as CSE and CIS majors for scheduling upper-division CSE courses that are **required** for their program; note, however, that they will be treated as non-majors for elective CSE courses.

CIS Minors are treated as non-majors for scheduling CSE courses and do not receive special priority for this purpose.

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**n**
BS-CSE Program Educational Objectives and Student Outcomes

Preamble

The term Program Educational Objective denotes, as specified in the EC Criteria (see ABET web site), the expected accomplishments of graduates of the program during the several years following graduation. Student Outcomes, again as specified by EC, are statements that describe what students are expected to know or be able to do by the time of graduation from the program; i.e., achievement of the outcomes should "foster attainment of the objectives".

There are three educational objectives, numbered (I) through (III). There are fourteen student outcomes, numbered (a) through (n). The outcomes (a) through (k) correspond (but are not identical) to the EC outcomes (3.a) through (3.k); (l), (m), and (n) correspond to the CAC specified outcomes.

BS-CSE Program Objectives

In the years immediately following their graduation:

I. Graduates of the program will be employed in the computing profession, and will be engaged in learning, understanding, and applying new ideas and technologies as the field evolves.

II. Graduates with an interest in, and aptitude for, advanced studies in computing will have completed, or be actively pursuing, graduate studies in computing.

III. Graduates will be informed and involved members of their communities, and responsible engineering and computing professionals.

BS-CSE Program Outcomes

Students in the BS-CSE program will attain:

a. an ability to apply knowledge of computing, mathematics including discrete mathematics as well as probability and statistics, science, and engineering;

b. an ability to design and conduct experiments, as well as to analyze and interpret data;

c. an ability to design, implement, and evaluate a software or a software/hardware system, component, or process to meet desired needs within realistic constraints such as memory, runtime efficiency, as well as appropriate constraints related to economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability considerations;

d. an ability to function on multi-disciplinary teams;

e. an ability to identify, formulate, and solve engineering problems;
BS-CSE Program Educational Objectives and Student Outcomes (contd.)

f. an understanding of professional, ethical, legal, security and social issues and responsibilities;
g. an ability to communicate effectively with a range of audiences;
h. an ability to analyze the local and global impact of computing on individuals, organizations, and society;
i. a recognition of the need for, and an ability to engage in life-long learning and continuing professional development;
j. a knowledge of contemporary issues;
k. an ability to use the techniques, skills, and modern engineering tools necessary for practice as a CSE professional;
l. an ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;
m. an ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;
n. an ability to apply design and development principles in the construction of software systems of varying complexity.
A Bachelor of Science in Computer Science and Engineering (BSCSE) is offered through the College of Engineering. This program offers students a general education in engineering, physical sciences, and mathematics, along with intensive study in computer science and engineering. The core curriculum in computer science includes courses in programming and software development, systems, and ethics.

Requirements for the Major

**CSE Core** (22 hours)

- CSE 2221 Software I ............................................................. (4)
- CSE 2231 Software II ............................................................ (4)
- CSE 2321 Foundations I ....................................................... (3)
- CSE 2331 Foundations II ...................................................... (3)
- CSE 2421 Systems I .............................................................. (4)
- CSE 2431 Systems II ............................................................ (3)
- CSE 2501 Professionalism and Ethics....................................(1)

**Non-CSE Core** (17 hours)

- ECE 2000 Electrical and Computer Engineering I ............. (4)
- ECE 2100 Electrical and Computer Engineering II ............ (4)
- Math 3345 Fdns of Higher Math ........................................... (3)
- Math 2568 Linear Algebra .................................................... (3)
- Stat 3470 Probability and Statistics .................................... (3)

**CSE Core Choices** (20 hours)

- CSE 390X Project ................................................................. (4)
- CSE 3231 or 3241 Software Eng or Databases .................... (3)
- CSE 3321 or 3341 Foundations/Theory ............................... (3)
- CSE 3421 or 3461 Systems: Arch/Networking ..................... (3)
- CSE 3521 or 3541 Applications: Art Inf/Graphics ................. (3)
- CSE 591X Capstone .............................................................. (4)

**Electives** (23 hours)

- Mathematics/Statistics Elective.......................................... (3)
- Science Elective .................................................................... (5)
- Technical Electives** .......................................................... (15)

**Engineering Core** (20 hours)

- Mathematics 1151, 1172............................. (10)
- Physics 1250 ................................................................. (5)
- Engineering 1181, 1182................................. (4)
- Engineering 1100.xx...................................................... (1)

**General Education** (24 hours)

- English ........................................................................... (6)
- Writing Level I
- Writing Level II
- Literature ................................................................. (3)
- Arts ................................................................................ (3)
- Historical Study ............................................................ (3)
- Social Science I and II ............................................... (6)
- Culture and Ideas: Ethics ............................................... (3)

**Technical Electives:**
At least 8 of the 15 hours must be CSE courses at the 3000-level or above; the remaining may be letter-graded non-CSE courses approved by the advisor.
At most 1 cr-hr of CSE 425X.
At most 2 cr-hrs total of CSE 4193, 4193H, 4998, 4998H, 4999, 4999H.
The CSE Advising Office can suggest tracks based on interest, and minor programs with 7 cr-hrs counted as Technical Electives.

MINIMUM TOTAL HOURS FOR DEGREE: 126

ACCREDITATION STATEMENT
The BS-CSE program is accredited by the Engineering Accreditation Commission (EAC) and the Computing Accreditation Commission (CAC), both of ABET, Inc., [http://www.abet.org](http://www.abet.org)
Both a Bachelor of Science (BS) and a Bachelor of Arts (BA) in Computer and Information Science are offered through the College of Arts and Sciences. These programs combine a broad liberal arts background with specialized study in computer science. This page describes the BS CIS program.

**Requirements for the Major**

### CSE Core (22 hours)

- CSE 2221 Software I ............................................................ (4)
- CSE 2231 Software II ........................................................... (4)
- CSE 2321 Foundations I ....................................................... (3)
- CSE 2331 Foundations II ...................................................... (3)
- CSE 2421 Systems I ............................................................. (4)
- CSE 2431 Systems II ........................................................... (3)
- CSE 2501 Professionalism and Ethics .................................. (1)

### Non-CSE Core (15 hours)

- Physics 1250 Physics I ......................................................... (5)
- ECE 2000 Electrical and Computer Engineering I ............... (4)
- Math 3345 Fdns of Higher Math........................................... (3)
- Stat 3470 Probability and Statistics ...................................... (3)

### CSE Core Choices (20 hours)

- CSE 390X Project ................................................................. (4)
- CSE 3231 or 3241 Software Eng or Databases ..................... (3)
- CSE 3321 or 3341 Foundations/Theory ................................ (3)
- CSE 3421 or 3461 Systems: Arch/Networking .................... (3)
- CSE 3521 or 3541 Applications: Art Inf/Graphics ............... (3)
- CSE 591X Capstone ............................................................. (4)

### Electives (20 hours)

- Science Elective* ............................................................... (5)
- Technical Electives** ......................................................... (15)

### Mathematics/Other (11 hours)

- ASC/NMS 1100.xx Survey .................................................... (1)
- Math 1151 Calculus I ....................................................... (5)
- Math 1152 Calculus II ....................................................... (5)

### General Education Curriculum (36 hours)

- Writing Level I & II .......................................................... (6)
- Literature ........................................................................... (3)
- Arts ................................................................................... (3)
- Historical Study ............................................................... (3)
- Social Science 1 & II ......................................................... (6)
- Culture & Ideas or Historical Study .................................... (3)
- Foreign Language ............................................................. (12)

*Science Elective: This must be chosen to meet the ASC GE requirements. That is, Phys 1250 plus other science course(s) must include a physical sc. and a bio sc. lab; and must add to at least 10 cr hrs. Since there are no 5-hr bio sc. lab courses, this will mean a total of 3 courses including a bio sc. lab (such as HCS 2201/2202 (4 hrs)) and another sc. course (e.g., HCS 2200, EarthSc 1151, ENR 2100, etc. (3 hrs each)) for a minimum total of 12 cr hrs. See ASC website for full details (ascadvising.osu.edu)

**Technical Electives: At least 8 of the 15 hours must be CSE courses at the 3000-level or above; the remaining may be letter-graded non-CSE courses approved by the advisor. At most 1 cr-hr of CSE 425X; and at most 2 cr-hrs total of CSE 4193, 4193H, 4998, 4998H, 4999, 4999H. The CSE Advising Office can suggest tracks based on interest.

**MINIMUM TOTAL HOURS FOR DEGREE:** 124

Note: Arts and Sciences College requires that students earn at least a “C-” or better for all courses listed for the major

**ACCREDITATION STATEMENT**
The BSCIS program has not sought and is not accredited by a commission of ABET, Inc.
Requirements for the Major

CSE Core (20 hours)

- CSE 2221 Software I ....................................................... (4)
- CSE 2231 Software II ..................................................... (4)
- CSE 2321 Foundations I .................................................. (3)
- CSE 2421 Systems I ........................................................ (4)
- CSE 2501 Professionalism and Ethics............................... (4)
- CSE 390X Project ........................................................... (1)

Related Field Core (12 hours)

- Intellectually coherent selection of courses with a clear relationship of the related field to computing;
- At least 6 cr-hrs must be at the 2000-level or above;
- The CSE Advising Office can suggest possible related fields based on student's interests.

Electives (27 hours)

- Must include at least 13 cr-hrs of CSE elective courses chosen from CSE 2331, CSE 2431, and other CSE courses at the 3000-level or above;
- Must include at least 6 cr-hrs of Related Field courses at the 2000-level or above;
- May include up to 4 cr-hrs of technical courses that are neither CSE courses nor Related Field courses; these must be from courses designated by the CSE Undergraduate Studies Committee; the remaining hours must be from CSE and the Related Field;
- At most 1 cr-hr of CSE 425X;
- At most 2 cr-hrs total of CSE 4193, 4193H, 4998, 4998H, 4999, 4999H
- The CSE Advising Office can suggest tracks based on student interest.

Mathematics/Science (27 hours)

- ASC/NMS 1100.xx Survey .............................................. (1)
- Math 1151 Calculus I ....................................................... (5)
- Math 1152 Calculus II ..................................................... (5)
- Statistics 2450 or higher Data Analysis ........................... (3)
- Science*................................................................. (10)
- Additional Math or Science ............................................ (3)

General Education Curriculum (36 hours)

- Writing I & II ................................................................. (6)
- Literature ................................................................. (3)
- Arts ................................................................. (3)
- Historical Study ....................................................... (3)
- Social Sciences 1 & 2 .................................................. (6)
- Culture & Ideas or Historical Study ............................... (3)
- Foreign Language ...................................................... (12)

MINIMUM TOTAL HOURS FOR DEGREE: 122

*Science: These hours must be chosen to meet the ASC GE requirements. That is, they must include three courses, with at least one in GE biological science, one in GE physical science, and at least one course with a lab; must add up to a minimum of 10 cr-hrs.

Note: Arts and Sciences College requires that students earn at least a “C-” or better for all courses listed for the major.

ACCREDITATION STATEMENT
The BACIS program has not sought and is not accredited by a commission of ABET, Inc.
Minor in Computer and Information Science

A student may choose one of the following three tracks for a minor in Computer and Information Science. Courses applied to the minor may not be applied to the major.

- One of Programming Fundamentals Track A, B, or C is required
- All courses under CIS Core must be completed
- Tech Electives may be any chosen from the following: CSE 2231, 2331, 2421, 3241, 4251, 4252, 4253, 4254, 4471; Math 3345; and other courses approved by the CSE Advising Office.
- Minor program final approval must be obtained from the CSE Advising Office
- ASC minor guidelines apply to transfer credits, overlaps, grades, etc.

**Programming Fundamentals: Track A**
Pre-req†: Computational Thinking in Context: Images, Animation, and Games .........................................................CSE 1211/1212  (3)
Software I: Software Components .................................................................................................................................CSE 2221     (4)

Total Track A cr-hrs (†pre-req hrs not included) ................................................................. (4)

**Programming Fundamentals: Track B**
Pre-req†: Introduction to Computer Programming in C++ for Engr ..............................................................................CSE 1222      (3)
Data Structures Using C++ ..........................................................................................................................................CSE 2122      (3)

Total Track B cr-hrs (†pre-req hrs not included) ................................................................. (3)

**Programming Fundamentals: Track C**
Pre-req†: Introduction to Computer Programming in Java .............................................................................................CSE 1223     (3)
Data Structures Using Java ..........................................................................................................................................CSE 2123     (3)

Total Track C cr-hrs (†pre-req hrs not included) ................................................................. (3)

**CIS Core**
Foundations I ...............................................................................................................................................................CSE 2321   (3)
Professionalism and Ethics .........................................................................................................................................CSE 2501   (1)

Total CIS Core cr-hrs .......................................................................................................................... (4)

**Technical Electives**
Technical Elective ............................................................................................................................................................(3-4)
Technical Elective ............................................................................................................................................................(3-4)

Total Technical Electives cr-hrs .........................................................................................................................≥ (6)

**Grand Total** .............................................................................................................................................................. ≥ 13
(Note that pre-req hours are not included in total)
## Minor in Computational Science and Engineering

- Prerequisites for minor: Calculus I and II (Math 1151.xx and (Math 1152.xx or Math 1172))
- Approved courses from other participating RRSCS institutions may be substituted; see program director for details.
- Total minimum semester hours required = 19
- No more than 6 credit hours may be transfer credits.
- Students must take at least 6 credit hours from outside their major department

### Core (Required): Simulation and Modeling (one course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Code</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Finite Element Applications in BME</td>
<td>BIOMEDE 5430</td>
<td>(3)</td>
</tr>
<tr>
<td>Modeling and Simulation</td>
<td>CHBE 5790</td>
<td>(3)</td>
</tr>
<tr>
<td>Systems Modeling</td>
<td>ISE 2010</td>
<td>(3)</td>
</tr>
<tr>
<td>Discrete Event Simulation</td>
<td>ISE 5100</td>
<td>(3)</td>
</tr>
<tr>
<td>Applied Finite Element Method</td>
<td>MECHENG 5139</td>
<td>(3)</td>
</tr>
<tr>
<td>Modeling and Simulation Lab I</td>
<td>MATSCEN 2321</td>
<td>(3)</td>
</tr>
</tbody>
</table>

### Core (Required): Programming and Algorithms (one course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Code</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intro to Computer Prog in MATLAB for Engrs and Scientists</td>
<td>CSE/ENGINEER 1221</td>
<td>(2)</td>
</tr>
<tr>
<td>Intro to Computer Prog in C++ for Engrs and Scientists</td>
<td>CSE/ENGINEER 1222</td>
<td>(3)</td>
</tr>
<tr>
<td>Software I: Software Components</td>
<td>CSE 2221</td>
<td>(4)</td>
</tr>
</tbody>
</table>

### Core (Required): Numerical Methods (one course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Code</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numerical Methods in Aerospace Engineering</td>
<td>AEROENG 3581</td>
<td>(3)</td>
</tr>
<tr>
<td>Numerical Analysis Methods for Civ/Env Eng Apps</td>
<td>CIVILEN 2060</td>
<td>(4)</td>
</tr>
<tr>
<td>Numerical Methods</td>
<td>CSE 5361</td>
<td>(3)</td>
</tr>
<tr>
<td>Introduction to Computational Electromagnetics</td>
<td>ECE 5510</td>
<td>(3)</td>
</tr>
<tr>
<td>Beginning Scientific Computing</td>
<td>Math 3607</td>
<td>(3)</td>
</tr>
<tr>
<td>Introduction to Numerical Methods</td>
<td>MECHENG 2850</td>
<td>(3)</td>
</tr>
</tbody>
</table>

### Core (Required): Optimization (≥3 hrs)

<table>
<thead>
<tr>
<th>Course</th>
<th>Code</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Evaluation and Optimization in Civ/EnvEng</td>
<td>CIVILEN 3080</td>
<td>(3)</td>
</tr>
<tr>
<td>Optimization for Static and Dynamic Systems</td>
<td>ECE 5759</td>
<td>(3)</td>
</tr>
<tr>
<td>Optimization for Enterprise Systems</td>
<td>ISE 3200</td>
<td>(3)</td>
</tr>
<tr>
<td>Optimization for System Design</td>
<td>ISE 3210</td>
<td>(3)</td>
</tr>
<tr>
<td>Engineering Optimization</td>
<td>ISE 3990.3</td>
<td>(2)</td>
</tr>
<tr>
<td>Linear Optimization</td>
<td>ISE 5200</td>
<td>(3)</td>
</tr>
<tr>
<td>Materials Selection</td>
<td>MATSCEN 4181</td>
<td>(2)</td>
</tr>
</tbody>
</table>

### Core (Required): Optimization for Enterprise Systems (≥3 hrs)

<table>
<thead>
<tr>
<th>Course</th>
<th>Code</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Computational Aerodynamics</td>
<td>AEROENG 5615</td>
<td>(3)</td>
</tr>
<tr>
<td>Molecular Informatics</td>
<td>CHBE 5734</td>
<td>(3)</td>
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<tr>
<td>Computational Chemistry</td>
<td>Chem 644</td>
<td>(3)</td>
</tr>
<tr>
<td>Foundations II: Data Structures and Algorithms</td>
<td>CSE 2331</td>
<td>(3)</td>
</tr>
<tr>
<td>Systems II: Introduction to Operating Systems</td>
<td>CSE 2341</td>
<td>(3)</td>
</tr>
<tr>
<td>Introduction to Database Systems</td>
<td>CSE 3241</td>
<td>(3)</td>
</tr>
<tr>
<td>Principles of Programming Languages</td>
<td>CSE 3341</td>
<td>(3)</td>
</tr>
<tr>
<td>Introduction to Computer Architecture</td>
<td>CSE 3421</td>
<td>(3)</td>
</tr>
<tr>
<td>Computer Networking and Internet Technologies</td>
<td>CSE 3461</td>
<td>(3)</td>
</tr>
<tr>
<td>Survey of Artificial Intelligence I: Basic Techniques</td>
<td>CSE 3521</td>
<td>(3)</td>
</tr>
<tr>
<td>Computer Game and Animation Techniques</td>
<td>CSE 3541</td>
<td>(3)</td>
</tr>
<tr>
<td>Introduction to Computational Electromagnetics</td>
<td>ECE 5510</td>
<td>(3)</td>
</tr>
<tr>
<td>Computational Materials Modeling</td>
<td>MATSCEN 6756</td>
<td>(2)</td>
</tr>
</tbody>
</table>

### Discipline-Specific (Required): Capstone Research/Internship

- Computationally oriented capstone course or individual research

- ≥ (2)

### Discipline-Specific (Required): Computational Study (one course) (≥3 hrs)

<table>
<thead>
<tr>
<th>Course</th>
<th>Code</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Computational Aerodynamics</td>
<td>AEROENG 5615</td>
<td>(3)</td>
</tr>
<tr>
<td>Molecular Informatics</td>
<td>CHBE 5734</td>
<td>(3)</td>
</tr>
<tr>
<td>Computational Chemistry</td>
<td>Chem 644</td>
<td>(3)</td>
</tr>
<tr>
<td>Foundations II: Data Structures and Algorithms</td>
<td>CSE 2331</td>
<td>(3)</td>
</tr>
<tr>
<td>Systems II: Introduction to Operating Systems</td>
<td>CSE 2341</td>
<td>(3)</td>
</tr>
<tr>
<td>Introduction to Database Systems</td>
<td>CSE 3241</td>
<td>(3)</td>
</tr>
<tr>
<td>Principles of Programming Languages</td>
<td>CSE 3341</td>
<td>(3)</td>
</tr>
<tr>
<td>Introduction to Computer Architecture</td>
<td>CSE 3421</td>
<td>(3)</td>
</tr>
<tr>
<td>Computer Networking and Internet Technologies</td>
<td>CSE 3461</td>
<td>(3)</td>
</tr>
<tr>
<td>Survey of Artificial Intelligence I: Basic Techniques</td>
<td>CSE 3521</td>
<td>(3)</td>
</tr>
<tr>
<td>Computer Game and Animation Techniques</td>
<td>CSE 3541</td>
<td>(3)</td>
</tr>
<tr>
<td>Introduction to Computational Electromagnetics</td>
<td>ECE 5510</td>
<td>(3)</td>
</tr>
<tr>
<td>Computational Materials Modeling</td>
<td>MATSCEN 6756</td>
<td>(2)</td>
</tr>
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### Electives (one course)

<table>
<thead>
<tr>
<th>Course</th>
<th>Code</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Parallel Computing</td>
<td>CSE 5441</td>
<td>(3)</td>
</tr>
<tr>
<td>Introduction to Scientific Visualization</td>
<td>CSE 5544</td>
<td>(3)</td>
</tr>
<tr>
<td>Differential Equations and Their Applications</td>
<td>Math 2255</td>
<td>(3)</td>
</tr>
<tr>
<td>Ordinary and Partial Differential Equations</td>
<td>Math 2415</td>
<td>(3)</td>
</tr>
</tbody>
</table>
CSE Course Syllabi are available at the following website:

http://coe-portal.cse.ohio-state.edu/pdf-exports/CSE/
Departmental Resources and Supplemental Activities

In addition to the regular curriculum, students may seek intellectual and professional enrichment through departmental events and various university-sponsored programs.

Faculty

The CSE teaching faculty includes 36 professors with Ph.D.'s covering a wide variety of computing areas; several lecturers and instructors with M.S. or PhD degrees in computing; and about 66 graduate teaching associates who handle recitation sections of introductory courses, assist in computing labs, and help to grade upper-level courses. With few exceptions, course section sizes are restricted to 40 to encourage teacher-student interaction. All CSE majors are assigned an academic advisor, and a faculty advisor who can offer technical course and career suggestions.

Computing Facilities

In the OSU Department of Computer Science and Engineering the students, faculty and staff enjoy some of the best computing facilities available at OSU. The instructional environment includes over 300 HP workstations running the latest Windows software, as well as a multi-user Linux environment. There are also several research labs with computing environments customized for their particular needs. Members of the department can also utilize high performance computing resources available at the Ohio Supercomputer Center, including Oakley, an HP Xeon Cluster, and Glenn, and IBM Cluster 1350.

Student Organizations

Students are encouraged to become active in various professional societies in computer science: the Association for Computing Machinery (ACM), the Association for Computing Machinery for Women (ACM-W), and the Computer Society of the Institute for Electrical and Electronic Engineers (IEEE). Other societies include Upsilon Pi Epsilon (an honorary society for computer science students), the Society of Women Engineers, the Engineer's Council, the Black Undergraduate Engineers Council, the Engineering Speaking Society, the Ohio Society of Professional Engineers, OSU Open Source, and OSUNTSIG.

Each spring, the Computer Science and Engineering Department offers several one year scholarships with the intent of recognizing and encouraging excellence in the study of computing. The awards range from $500-$1500. See the following link for more details: http://www.cse.ohio-state.edu/ugrad/schols.shtml

Additional Activities

Europa is a forum for students engaged in research in component-based software engineering. Europa research focuses on component-based software as studied in the Software Component Engineering Course Sequence and on related topics pursued by the OSU CSE Reusable Software Research Group. See the following link for more details:

http://www.cse.ohio-state.edu/europa/

NEWPATH is a program intended for CSE and CIS students, at all levels, who are interested in IT entrepreneurship. The program brings together students, faculty, and outside IT entrepreneurs to explore issues related to IT entrepreneurship and help students develop their entrepreneurial skills. See the following link for more details:

http://www.cse.ohio-state.edu/ugrad/newpathhome.shtml

Scholarship Opportunities

Each spring, the Computer Science and Engineering Department offers several one year scholarships with the intent of recognizing and encouraging excellence in the study of computing. The awards range from $500-$1500. See the following link for more details:

http://www.cse.ohio-state.edu/ugrad/schols.shtml
Diversity Mission

The Diversity Program in CSE seeks to develop and educate a diverse and highly-regarded community of computer scientists through a supportive infrastructure for women and underrepresented minorities. Students are encouraged to become active in the many professional and special interest societies offered. Tutoring, mentoring, CSE newsgroup server, job postings, co-ops/internships are just a few of the many benefits of being active in the community.

http://www.cse.ohio-state.edu/diversity/index.shtml

Honors & Scholars Programs

University Honors & Scholars is a university-wide array of opportunities available to high-ability undergraduates. While there is some variation from College to College, these opportunities are designed to encourage and facilitate the pursuit of undergraduate academic excellence. At both the university and the college levels, exceptional students are encouraged to undertake honors programs, special classroom and research opportunities, and co-curricular activities which may result in an enhanced and distinctive undergraduate program.

Prospective students entering The Ohio State University must formally apply for honors affiliation through the University Honors & Scholars Center (220 West 12th Avenue, Columbus, OH 43210). Upon application approval, students are eligible to access the many opportunities available to honor-affiliated undergraduates, including priority scheduling privileges, honors residence halls, and honors classes. These classes are limited to 25 students and are taught by faculty. A currently enrolled undergraduate in a degree-granting college at the university must obtain formal honors affiliation through that college. For additional information, please contact the University Honors Center:

http://www.honors-scholars.ohio-state.edu/

In Engineering, the designation “engineering honors student” is awarded on a semester basis to college-designated undergraduates who have earned a cumulative GPA of at least 3.4. In addition, incoming direct-admit freshmen with an ACT composite score of at least 30 or a 1340 SAT combined score and in the top 10% of their high school graduating class may enroll in honors courses.
Career Services

Your college Career Services office is a valuable resource to help you reach your career goals. Whether you are an undergraduate just beginning to explore your options through co-op or internship experience, or an undergraduate or graduate student planning to graduate within a year, you will want to take full advantage of these services. For CSE students, opportunities abound to meet with employers here on campus, both through career fairs and through on-campus interviewing coordinated by each college. In addition, each career services office provides: career information (including salary statistics); information about potential employers; a variety of workshops and individual appointments to help with job search issues (interviewing skills, resume writing, job decisions); full-time career, co-op, internship, summer, and part-time job postings; resume referral services; and career fairs. Each career services office provides convenient web-based services to help registered students link with potential employers. Ohio State’s reputation for academic excellence means that many nationally known employers travel to campus to recruit our students.

For Engineering students, to take full advantage of all of the services and opportunities provided, you should plan to register with ECS at least two semesters prior to graduation—ideally, so that you are registered to interview during fall semester when most interviewing takes place. (Please note that if you have previously registered as a co-op or intern candidate, you will need to update your registration to participate in full-time employment services).

Students should register with the Career Services office serving their college of enrollment. To find out about the full range of services offered by each office and to learn about specific registration procedures, simply call, stop by, or visit the web site of the office that applies to you.

Cooperative Education & Internships

Students are strongly encouraged to participate in their college co-op or internship program, since employers of college graduates generally favor those with career-related experience. In fact, employers typically give first priority to hiring their own co-ops and interns for full time positions, since both students and employers have had the opportunity for a “test drive.”

Undergraduate students ready to seek practical, well-paid career-related work experience should start by visiting their College Career Services office. Program details and requirements for participation vary from college to college; however, students are encouraged to start pursuing practical experience as early as their sophomore year.

Cooperative Education (co-op) students alternate semesters of full-time work and full-time classes, usually maintaining a continuing commitment to the same employer throughout their undergraduate degrees. Internship students may work full-time for a single semester or two back-to-back semesters before returning to full-time studies. Part-time employment in computer-related positions is also available with many central Ohio employers, including Ohio State. The ASC career services office sponsors an Internship/Co-op Job Fair each spring and employer recruiting activities take place throughout the year, with peak activity in fall semester. ECS hosts the Expo in fall and the SWE Fair in spring semester.

Locating Your Career Services Office

Arts & Sciences Career Services (CIS)
48 Townsend Hall
1885 Neil Avenue
292-7055
http://ascareerservices.osu.edu

Engineering Career Services (CSE)
199 Hitchcock Hall
2050 Neil Ave.
292-6651
https://ecs.ous.edu