## Computer Science

**CS 498  Special Topics**  credit: 0 TO 4 hours.

Subject offerings of new and developing areas of knowledge in computer science intended to augment the existing curriculum. See Class Schedule or departmental course information for topics and prerequisites. May be repeated in the same or separate terms if topics vary.

<table>
<thead>
<tr>
<th>CRN</th>
<th>Type</th>
<th>Section</th>
<th>Time</th>
<th>Days</th>
<th>Location</th>
<th>Instructor</th>
</tr>
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<tbody>
<tr>
<td>43755</td>
<td>Lecture</td>
<td>DM3</td>
<td>12:30 PM - 01:45 PM</td>
<td>TR</td>
<td>1103 - Siebel Center for Comp Sci</td>
<td>Marinov, D</td>
</tr>
</tbody>
</table>

**Credit Hours: 3 hours**
**Software Testing**

Topic: Software Testing. This course will provide an introduction to systematic and organized approaches to software testing. Topics to be covered include testing process, coverage criteria, automatic and manual generation of test inputs, execution of tests, and validation of test outputs. This section is for undergraduate OR graduate students.

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<tr>
<td>48196</td>
<td>Lecture</td>
<td>DM4</td>
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**Credit Hours: 4 hours**
**Software Testing**

Restricted to Graduate - Urbana-Champaign.

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<tr>
<td>56907</td>
<td>Lecture</td>
<td>DP3</td>
<td>10:00 AM - 10:50 AM</td>
<td>MWF</td>
<td>1109 - Siebel Center for Comp Sci</td>
<td>Padua, D</td>
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**Credit Hours: 3 hours**
**Intro to Parallel Programming**

Topic: Intro to Parallel Programming for Computer Scientists and Computer Engineers. Parallel programming notations for shared and distributed memory machines, memory models, atomic operations, race conditions, synchronous and asynchronous computations, performance evaluation, parallel algorithms including graph algorithms, sorting, numerical linear algebra, and FFT. This section is for undergraduate or graduate students.

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<td>56968</td>
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<td>12:30 PM - 01:45 PM</td>
<td>WF</td>
<td>1103 - Siebel Center for Comp Sci</td>
<td>Fu, W</td>
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</table>
Credit Hours: 3 hours  
HCI Lab  
Restricted to students in the Computer Science department.  
Topic: HCI Lab. This is a lab course for the design and implementation of socio-computer interfaces, such as systems that support online communities, social networks, peer production, or collection actions. Students will engage in group projects throughout the course. Students with strong technical background in implementing user interfaces and knowledge in socio-computer interactions are preferred. This section is for undergraduate OR graduate students.

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<tr>
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<td>Lecture</td>
<td>HP3</td>
<td>09:30 AM - 10:45 AM</td>
<td>1103 - Siebel Center for Comp Sci</td>
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</tbody>
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Credit Hours: 3 hours  
Intro Computational Geometry  
Topic: Introduction to Computational Geometry. Computational geometry is a branch of computer science devoted to the study of algorithms which can be stated in terms of geometry. Important applications of computational geometry include robotics (motion planning and visibility problems), graphics, geographic information systems (GIS) (geometrical location and search, route planning), integrated circuit design (IC geometry design and verification), computer-aided engineering (CAE) (mesh generation). This course would be a gentle introduction to the field. The course would follow the book "Computational Geometry: Algorithms and Applications" by de Berg, Cheong, van Kreveld and Overmars. Prerequisite: CS 473 or equivalent. This section is for either undergraduate or graduate students.

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<td>LA</td>
<td>ARRANGED -</td>
<td>ARR - Siebel Center for Comp Sci</td>
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Credit Hours: 3 hours  
Undergrad Research Lab  
Restricted to Undergrad - Urbana-Champaign.  
Topic: Undergraduate Research Laboratory In this apprenticeship-style, hands-on laboratory, students learn to i) Pose testable research questions; ii) Write competitive grant proposals; iii) Create novel solutions using software and/or hardware; iv) Draw valid scientific conclusions; and v) Present and publish results, conclusions and other materials. This team-based course is for undergraduate students only.

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### 56905: Lecture MC3
**12:30 PM - 01:45 PM**  
WF  
1214 - Siebel Center for Comp Sci  
Caesar, M

**Credit Hours:** 3 hours  
**Networking Lab**  
**Topic:** Networking Lab. This course teaches an understanding of networks and systems design through hands-on construction and experimentation with real-world implementations. Students will perform bi-weekly projects in building, analyzing, evaluating, and deploying the communication protocols and server software that make up widely used network infrastructures. This course complements introductory computer networking courses such as CS 438 to cover practical and experimental aspects of networking. **Prerequisite:** CS 241 (Systems Programming), or equivalent course on operating systems or networking. This section is for either undergraduates or graduate students.

### 56906: Lecture MC4
**12:30 PM - 01:45 PM**  
WF  
1214 - Siebel Center for Comp Sci  
Caesar, M

**Credit Hours:** 4 hours  
**Networking Lab**  
**Restricted to Graduate - Urbana-Champaign.**  
**Topic:** Networking Lab. This course teaches an understanding of networks and systems design through hands-on construction and experimentation with real-world implementations. Students will perform bi-weekly projects in building, analyzing, evaluating, and deploying the communication protocols and server software that make up widely used network infrastructures. This course complements introductory computer networking courses such as CS 438 to cover practical and experimental aspects of networking. **Prerequisite:** CS 241 (Systems Programming), or equivalent course on operating systems or networking. This section is for graduate students only.

### 54566: Lecture MV3
**03:30 PM - 04:45 PM**  
TR  
1131 - Siebel Center for Comp Sci  
Viswanathan, M

**Credit Hours:** 3 hours  
**Logical Systems**  
**Topic:** Logical Systems. This course will provide an introduction to mathematical logic from the perspective of computer science, emphasizing decidable fragments of logic and decision algorithms. The topics covered will be motivated by applications in artificial intelligence, databases, formal methods and theoretical computer science. The goal of the course is to prepare students for using logic as a formal tool in computer science. The course will roughly cover the following topics (in this order): syntax, semantics and proof theory of propositional logic, sat-solvers, syntax of first-order, the resolution proof system, syntax of second-order logic, connections between monadic second order logic and regular languages (word and tree, finite and infinite), tree-width and Courcelle's theorem with applications to parametric complexity, finite model theory and descriptive complexity, games and inexpressiveness. **Prerequisite:** Courses CS 173, CS 225, and CS 373, or instructor's consent. In particular, students should be familiar with inductive proofs, propositional logic syntax, ability to use quantifiers (forall and exists) to express simple properties in first-order logic, basic properties of finite graphs, simple graph algorithms, finite automata and regular languages, deterministic and non-deterministic computational models, and complexity classes like NP. This section is for either undergraduate or graduate students.

### 54567: Lecture MV4
**03:30 PM - 04:45 PM**  
TR  
1131 - Siebel Center for Comp Sci  
Viswanathan, M

**Credit Hours:** 4 hours  
**Logical Systems**  
**Restricted to Graduate - Urbana-Champaign.**  
**Topic:** Logical Systems. This course will provide an introduction to mathematical logic from the perspective of computer science, emphasizing decidable fragments of logic and decision algorithms. The topics covered will be motivated by applications in artificial intelligence, databases, formal methods and theoretical computer science. The goal of the course is to prepare students for using logic as a formal tool in computer science. The course will roughly cover the following topics (in this order): syntax, semantics and proof theory of propositional logic, sat-solvers, syntax of first-order, the resolution proof system, syntax of second-order logic, connections between monadic second order logic and regular languages (word and tree, finite and infinite), tree-width and Courcelle's theorem with applications to parametric complexity, finite model theory and descriptive complexity, games and inexpressiveness. **Prerequisite:** Courses CS 173, CS 225, and CS 373, or instructor's consent. In particular, students should be
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