Class Schedule - Spring 2018

Computer Science

CS 498  **Special Topics**  credit: 1 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. 1 to 4 undergraduate hours. 1 to 4 graduate hours. 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>
</thead>
<tbody>
<tr>
<td>61698</td>
<td>Laboratory</td>
<td>AB1</td>
<td>09:00 AM - 10:50 AM</td>
<td>F</td>
<td>0222 - Siebel Center for Comp Sci</td>
<td>Bambenek, J</td>
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<tr>
<td>65904</td>
<td>Laboratory</td>
<td>AB2</td>
<td>11:00 AM - 12:50 PM</td>
<td>F</td>
<td>0222 - Siebel Center for Comp Sci</td>
<td>Bambenek, J</td>
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<tr>
<td>61697</td>
<td>Lecture</td>
<td>AL1</td>
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<td>MW</td>
<td>1302 - Siebel Center for Comp Sci</td>
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<tr>
<td>65685</td>
<td>Lecture</td>
<td>AML</td>
<td>03:30 PM - 04:45 PM</td>
<td>TR</td>
<td>1320 - Digital Computer Laboratory</td>
<td>Forsyth, D</td>
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<tr>
<td>67942</td>
<td>Online</td>
<td>AMO</td>
<td>ARRANGED</td>
<td>-</td>
<td>-</td>
<td>Forsyth, D</td>
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</table>

Digital Forensics II
This lab section will meet in 0222 Siebel Center

Credit Hours: 4 hours
Digital Forensics II
This is a course for graduate students and advanced undergraduates wanting to develop greater depth and breadth in digital forensics and assumes a basic knowledge of the material covered in Digital Forensics I. Topics include standards of evidence, investigatory procedures, forms of investigation, legal procedures, reasoning about evidence, psychology of cyber crime, anti-forensics, multimedia forensics, computer forensics, web browser forensics, embedded systems forensics, network forensics, cloud forensics, applications forensics, and fraud examination. It introduces known barriers and open challenges in the field. Prerequisite: Completion of Digital Forensics I or special permission granted by the instructor.

Credit Hours: 3 hours
Applied Machine Learning
Techniques of machine learning, with applications to various signal problems. Techniques covered will be: regression including linear regression, multiple regression, regression forests and nearest neighbors regression; classification with various methods including logistic regression, support vector machines, nearest neighbors, simple boosting and decision forests; clustering with various methods including basic agglomerative clustering and k-means; resampling methods, including cross-validation and the bootstrap; model selection methods, including AIC, stepwise selection and the lasso; hidden Markov models; model estimation in the presence of missing variables; and neural networks, including deep networks. The course is intended to support students who wish to apply machine learning methods, and will focus on tool-oriented and problem-oriented exposition. Application areas include computer vision, natural language, interpreting accelerometer data, and understanding audio data. Prereq: A course in probability or statistics, a course in linear algebra, and some programming experience.

Credit Hours: 4 hours
Applied Machine Learning
Restricted to MCS:Computer Sci Online -UIUC.
This course is only for students that are in the Computer Science MCS-DS Program. Additional Coursera ID verification and ProctorU fees may apply. Description: Techniques of machine learning, with applications to various signal problems. Techniques covered will be: regression including linear regression, multiple regression, regression forests and nearest neighbors regression; classification with various methods including logistic regression, support vector machines, nearest neighbors, simple boosting and decision forests; clustering with various methods including basic agglomerative clustering and k-means; resampling methods, including cross-validation and the bootstrap; model selection methods, including AIC, stepwise selection and the lasso; hidden Markov models; model estimation in the presence of missing variables; and neural networks, including deep networks. The course is intended to support students who wish to apply machine learning methods, and will focus on tool-oriented and problem-oriented exposition. Application areas include computer vision, natural language, interpreting accelerometer data, and understanding audio data.

67780  Lecture-Discussion  CPS  ARRANGED -  ARR - Illini Center  Caccamo, M

Credit Hours: 3 hours
Cyber Physical-Systems
In this course, we will delve into topics that deal with the design and temporal analysis of cyber-physical and embedded systems. The goal of this course is to provide a deep understanding about resource management, analysis and safety of modern embedded systems that interact with the physical world, especially those that have different degrees of criticality and stringent timing requirements. Examples of such systems include modern automobiles, avionics and flight systems, space vehicles and satellites, medical equipment, power distribution grid, and robotics devices among others. This course has a mixed structure with both regular lectures and some research paper presentations. Students will give one in class presentation about state-of-art research papers published in top conferences and journals. The course is structured to improve students' ability for critical thinking. In-class discussion will focus on classic real-time systems theory and some state-of-art research work on cyber-physical and real-time embedded systems. Part of studied theory will be applied to the design of a simple control system for an Unmanned (Aerial) Vehicle. Course requirements include a project to be completed by students organized as teams. Prerequisites: This class admits both senior undergrads and graduate students. The prerequisite for this class is CS241 (System Programming), or consent of the instructor. Restricted to O/C Engineering City Scholars students.

68232  Online  CSP  ARRANGED -  -  Forsyth, D

Credit Hours: 3 hours
Applied Machine Learning
Restricted to O/C Engineering City Scholars students.

68121  Lecture  DSG  10:00 AM - 11:30 AM  MW  0216 - Siebel Center for Comp Sci  Campbell, R
Iyer, R

Credit Hours: 4 hours
Data Science & Analytics

65868  Online  DSO  ARRANGED -  -  Campbell, R
Farivar, R

Credit Hours: 4 hours
Cloud Computing Applications
Restricted to MCS:Computer Sci Online -UIUC or NDEG:Computer Science Onl-UIUC.
This course is only for students that are in the Computer Science MCS-DS Program. Additional Coursera ID verification and ProctorU fees may apply.

68120  Lecture  DSU  10:00 AM - 11:30 AM  MW  0216 - Siebel Center for Comp Sci  Campbell, R
Iyer, R

Credit Hours: 3 hours
Data Science & Analytics

67978  Lecture-Discussion  GH3  10:30 AM - 11:50 AM  MW  206 - Transportation Building  Herman, G
<table>
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<tr>
<th>Course Code</th>
<th>Meeting Type</th>
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<th>Time</th>
<th>Instructor</th>
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<td>MS4</td>
<td>10:00 AM - 11:20 AM</td>
<td>Snir, M</td>
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Title: Learning and Computer Science

Restricted to Engineering. Restricted to Undergrad - Urbana-Champaign.

Title: Learning and Computer Science

Restricted to Graduate - Urbana-Champaign.

Title: Applied Machine Learning

Restricted to MS: Civil Engr - Online - UIUC, MCS:Computer Sci Online -UIUC, MS: Mechanical Engineering - UIUC, MS: Aerospace Engr-Online-UIUC, NDEG:Grad Nondegree-CE-UIUC, NDEG:Undergrad Nondeg-CE-UIUC, or MENG:Mech Engineering Onl-UIUC. Restricted to online non-degree, online MCS, online MSAE, online MSME, and online MSCE students. For more details on this course section, please see [http://engineering.illinois.edu/online/courses/](http://engineering.illinois.edu/online/courses/).
### Credit Hours: 3 hours  
**Audio Computing Lab**

This course will cover the computational foundations of modern audio applications. This will be a lab-like course in which students will be required to bring in their laptops in class and collectively implement a variety of core audio operations that are commonplace today. In this class we will cover the necessary theory to start working on audio processing, and implement a variety of applications such as room and 3D/virtual audio rendering, pitch manipulations and autotuning, denoising for communications and forensics, audio classification, music information retrieval based on audio, rudimentary speech recognition, speech and audio coding, applications of machine learning to audio scene recognition, audio restoration, missing data recovery, and many more. Students will need to have a good grasp of programming in Python (or MATLAB) and will be required to bring to class their laptops and headphones to participate in lab exercises. Suggested prerequisites include MATH416 (or equivalent) and CS241.

<table>
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<th>PS4</th>
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<th>0216 - Siebel Center for Comp Sci</th>
<th>Smaragdis, P</th>
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</thead>
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### Credit Hours: 4 hours  
**Audio Computing Lab**  
Restricted to Graduate - Urbana-Champaign.

This course will cover the computational foundations of modern audio applications. This will be a lab-like course in which students will be required to bring in their laptops in class and collectively implement a variety of core audio operations that are commonplace today. In this class we will cover the necessary theory to start working on audio processing, and implement a variety of applications such as room and 3D/virtual audio rendering, pitch manipulations and autotuning, denoising for communications and forensics, audio classification, music information retrieval based on audio, rudimentary speech recognition, speech and audio coding, applications of machine learning to audio scene recognition, audio restoration, missing data recovery, and many more. Students will need to have a good grasp of programming in Python (or MATLAB) and will be required to bring to class their laptops and headphones to participate in lab exercises. Suggested prerequisites include MATH416 (or equivalent) and CS241.

<table>
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<th>67775</th>
<th>Lecture-Discussion</th>
<th>TC3</th>
<th>02:00 PM - 03:15 PM</th>
<th>WF</th>
<th>1109 - Siebel Center for Comp Sci</th>
<th>Chan, T</th>
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### Credit Hours: 3 hours  
**Computational Geometry**

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<th>67785</th>
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<th>TC4</th>
<th>02:00 PM - 03:15 PM</th>
<th>WF</th>
<th>1109 - Siebel Center for Comp Sci</th>
<th>Chan, T</th>
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### Credit Hours: 4 hours  
**Computational Geometry**  
Restricted to Graduate - Urbana-Champaign.

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<th>50232</th>
<th>Lecture</th>
<th>VR3</th>
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<th>MW</th>
<th>1320 - Digital Computer Laboratory</th>
<th>Angrave, L</th>
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### Credit Hours: 3 hours  
**Virtual Reality**

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<thead>
<tr>
<th>50234</th>
<th>Lecture</th>
<th>VR4</th>
<th>04:00 PM - 05:15 PM</th>
<th>MW</th>
<th>1320 - Digital Computer Laboratory</th>
<th>Angrave, L</th>
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### Credit Hours: 4 hours  
**Virtual Reality**