Course Description: This course covers wireless Internet access technologies, pervasive mobile device architecture, and information appliances in Internet and cloud applications. Important topics include smart phones and tablet computers, sensors, RFID and GPS technologies, 3G/4G cellular radio networks, WiFi meshes, Zigbee, mobile OS (Android and iOS), software tools for resource discovery, location-sensitive applications, the Internet of things, big-data analytics, security and privacy control, and mobile cloud computing, etc.

Prerequisite: EE 450 (Computer Networks) or passing the placement test of EE 450.

Course Syllabus: (27 lectures, 2 quizzes, 2 surveys, mid-term exam, and final paper)
1. Introduction and Internet Evolution (Lectures 1, 2 on Jan.13 and 15, 2014)
2. Overview of Wireless Internet Technologies (Lecture 3, Jan.22, no class on Jan. 20)
3. 32 Candidate topics for Survey Studies (Lecture 4, Jan.27)
4. 2G/3G cellular networks (GSM, CDMA, WCDMA) (Lecture 5 on Jan.29)
5. 4G mobile networks (LTE and Mobile WiMax), (Lecture 6, Feb.3 )
6. WiFi, Bluetooth, WLAN and Meshes (Lectures 7 and 8 on Feb. 5 and 10), Proposal for Survey Study due Feb.5.
7. Smart phones and Multi-touch Technology, etc. (Lectures 9, 10 on Feb. 12, 19, no class on Feb.17)
8. Tablet computers (Lectures 11 on Feb. 24),
9. Mobile OS (Android, iOS) and Apps. (Lectures 12,13 on Feb. 26, March 3)
10. Zigbee, Sensors, and Sensor Networks, Lectures 14, 15 on March 5, 10), Spring Recess, March 17 ~ 22 (No class)
11. Mid-term Exam. March 12, 2014, 9 -11 am, room TBA, covering Lectures 1 ~15
12. RFID technology and Apps. (Lecture 16 on March 24 ), Survey Report #1 due March 24 by all students
13. The Internet of Things (IoT) (Lectures 17, 18 on March 26, 31 )
14. GPS Technology and Systems (Lecture 19 on April 2 )
15. Bid-Data Science and Technology (Lecture 20, April 7)
16. Cloud Models and Infrastructures (Lecture 21, April 9),
17. Cloud-centric IoT Processing (Lecture 23, April 16), Survey Report #2 due April 16 by remote DEN students only.
18. BTOC and Mashup Cloud Services (Lecture 24, on April 21)
19. New IoT/Cloud Applications (Lecture 25, on April 23), Quiz # 2 on April 23 for all students covering Lectures 16 ~ 24
20. Data privacy and Security Issues (Lecture 26, on April 28)
21. Hot Research Topics and Future Trends (Lecture 27, April 30)

Final Project Paper due May 5 in EEB 212 before noon time. (submit both hard copy and on-line Word file)

Required Textbook:

Optional Reference Book:

Grading Policy and Class Procedures:
1. Visit the DEN Blackboard frequently for announcement, handout material, and records. The mid-term exam and final project reports are required for all students. All quizzes and mid-term exam are close-book and close-notes. Check with the TA first for all questions on reports, quizzes, tests and recorded grade scores. Remote DEN students do not take Quiz # 1 in general. With special arrangement, they can also take Quiz #1 in order to skip Survey #2. On-campus students do not do Survey #2. All students must take the mid-term exam, Quiz #2 and submit technical reports on Survey #1 and Final Project Report as weighted below.

2. A list of 32 topics is handed out on Jan.27, 2014 for you to select from. See Lecture 4 slides for details. Each Survey requires you to study 10 ~ 20 recent papers or technical reports. You will produce the Survey Report on about 15 pages with well illustrated technical contents. Two on-campus students form a team to perform the Survey Study. But a few campus students are allowed to do it alone. All topic choices or options must be approved by Prof. Hwang in advance. Remote students do 2 Survey Studies individually on two mutually supportive topics up to your choice.
3. Grading Policy and Important Dates (Note the differences in Quiz # 1 and Survey #2 for on-campus and remote DEN students)

<table>
<thead>
<tr>
<th>Class Event</th>
<th>Quiz # 1 (10%)</th>
<th>Mid-Term Exam (40%)</th>
<th>Survey #1 (10%)</th>
<th>Survey #2 (10%)</th>
<th>Quiz # 2 (15%)</th>
<th>Final Project (25%)</th>
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</thead>
<tbody>
<tr>
<td>On-Campus Students</td>
<td>Feb. 19</td>
<td>March 12 for all students</td>
<td>March 24 for all students</td>
<td>Not for campus students</td>
<td>April 23 for all students</td>
<td>May 5, 2014 for all students</td>
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<tr>
<td>Remote DEN Students</td>
<td>Not for DEN students</td>
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4. In the Final Project Paper, you can propose your own topic which extends from the Survey Studies. The propose final topic must be approved by Hwang in advance. Two campus students forming a team to submit one final report. Remote student does it individually. The Final Term Paper on 20 pages should report creative research findings by extending from related Survey Studies. The topics for Survey Studies and Final Project should be coordinated along the same line of technical interest.