Syllabus

Course Number: MSCT 600
Course Title: Networking Essentials

Course Description:
This course provides an overview of the technologies used in local area networks, telephony, web basics, wide area networking, etc. Network Essentials introduces concepts central to network design, architectures, standards and protocols. It emphasizes application of these concepts to the analysis of various business case studies, along with installation and configuration of small networks in the classroom. Topics include network media, network communications and protocols, network architectures, network operating systems, network administration and support issues, distributed network environments and internetworking.

Prerequisite Courses:
MSCC 610 Information System Concepts

Course Outcomes:
Upon completion of this course, learners should be able to:

• Recommend Internet access technologies, transmission hardware, cabling, operating system, interconnecting hardware and connection services for a small office LAN.
• Explain at least three key trends driving future of the networking industry.
• Compare the three types of application architectures used in networks: client-server, peer-to-peer (P2P) and hybrid applications.
• Explain several popular application-layer protocols including Hypertext Transfer Protocol (HTTP), Simple Mail Transfer Protocol (SMTP) and Domain Name Service (DNS).
• List the advantages and disadvantages of Transmission Control Protocol (TCP) and User Datagram Protocol (UDP).
• Evaluate multiple transport layer protocols including Datagram Congestion Control Protocol (DCCP) and Stream Control Transmission Protocol (SCTP).
• Explain the functions and services provided by the network layer.
• Explains the principles of routing and routing protocols and the importance of routing optimization in enterprise networks.
• Explain link-layer services including error control, flow control, physical addressing and access control.
• Analyze Ethernet framing and ARP functionality using Wireshark.
• Explain radio frequency properties, behaviors, and mechanisms needed to support wireless LANs and mobile phones.
• Describe the QoS challenges posed by wireless networks and by the mobility that wireless networks provide.
• Explain the architectures and mechanisms that make the best of today’s best-effort Internet service.
• Describe new mechanisms needed for the next-generation network (NGN) broadband infrastructure where end-to-end QoS is guaranteed.

Course Materials:

Required Texts:


Technology Tools:

A personal computer with one of the following Windows operating systems: Vista or Windows 7. Wireshark will also run on Mac OS-X and Linux systems.


Supplemental Materials:


Pre-Assignment:

Read Chapter 1 in your text book. Then download Wireshark and the Wireshark user guide by Lamping (2010). Use the user guide to install and test Wireshark on your computer. A specific activity for learning how to use Wireshark will be available once your class begins (online sections) or from your instructor before the first night of class (classroom courses). This will include instructions on how to write up your first activity and present it to your instructor.

Online Format: Sign on to D2L (Home Page) and become familiar with the course navigation of the Web Curriculum.

Pre-Assignment Due Dates:

This assignment will be due at 11:59 pm on Sunday night at the end of the first week of class, for both online and classroom courses. Your instructor will tell you how to submit the assignment.

Course Assignments and Activities:

<table>
<thead>
<tr>
<th></th>
<th>Topics</th>
<th>Readings</th>
<th>Activities Assignments and Associated Points</th>
</tr>
</thead>
</table>
Discussion Forum Questions  
Lab Report – Getting Started in Wireshark, 50 points  
Participation, 25 points |
| 2 | Inside Application Layer Functions and Protocols | Kurose & Ross (2010) chapter 2. | Knowledge Check  
Watch Video  
Discussion Forum Questions  
Lab Report - HTTP, 50 points  
Participation, 25 points |
<table>
<thead>
<tr>
<th></th>
<th>Topics</th>
<th>Readings</th>
<th>Activities Assignments and Associated Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Transport Layer Functions and Protocols</td>
<td>Kurose &amp; Ross (2010) ch 3.</td>
<td>Knowledge Check&lt;br&gt;Watch Video&lt;br&gt;Discussion Forum Questions&lt;br&gt;Wireshark Lab - TCP, 50 points&lt;br&gt;Final Project Proposal, 50 points&lt;br&gt;Participation, 25 points</td>
</tr>
<tr>
<td>4</td>
<td>Network Layer Functions: IP Addressing</td>
<td>Kurose &amp; Ross (2010) ch 4.1 to 4.4</td>
<td>Knowledge Check&lt;br&gt;Discussion Forum Questions&lt;br&gt;Wireshark Lab - Packet analysis, 50 points&lt;br&gt;Written Paper – RFCs on IP Addressing, 100 points&lt;br&gt;Participation, 25 points</td>
</tr>
<tr>
<td>5</td>
<td>Network Layer Functions: IP Routing</td>
<td>Kurose &amp; Ross (2010) ch 4.5 to 4.8</td>
<td>Knowledge Check&lt;br&gt;Simulation&lt;br&gt;Discussion Forum Questions&lt;br&gt;Lab – Routing Protocols, 50 points&lt;br&gt;Participation, 25 points</td>
</tr>
<tr>
<td>7</td>
<td>Wireless LAN and Mobile Phone Connectivity</td>
<td>Kurose &amp; Ross (2010) ch 6.</td>
<td>Knowledge Check&lt;br&gt;Discussion Forum Questions&lt;br&gt;Wireless Network Design, 100 points&lt;br&gt;Participation, 25 points</td>
</tr>
<tr>
<td>8</td>
<td>Networking Multimedia Applications</td>
<td>Kurose &amp; Ross (2010) ch 7.</td>
<td>Knowledge Check&lt;br&gt;Discussion Forum Questions&lt;br&gt;Final Project, 250 points&lt;br&gt;Participation, 25 points</td>
</tr>
</tbody>
</table>

Maximum Points Possible: 1000
### CC&IS Grading Scale

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>Percentage</th>
<th>Grade Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93 to 100</td>
<td>4.00</td>
</tr>
<tr>
<td>A–</td>
<td>90 to less than 93</td>
<td>3.67</td>
</tr>
<tr>
<td>B+</td>
<td>87 to less than 90</td>
<td>3.33</td>
</tr>
<tr>
<td>B</td>
<td>83 to less than 87</td>
<td>3.00</td>
</tr>
<tr>
<td>B–</td>
<td>80 to less than 83</td>
<td>2.67</td>
</tr>
<tr>
<td>C+</td>
<td>77 to less than 80</td>
<td>2.33</td>
</tr>
<tr>
<td>C</td>
<td>73 to less than 77</td>
<td>2.00</td>
</tr>
<tr>
<td>C–</td>
<td>70 to less than 73</td>
<td>1.67</td>
</tr>
<tr>
<td>D+</td>
<td>67 to less than 70</td>
<td>1.33</td>
</tr>
<tr>
<td>D</td>
<td>63 to less than 67</td>
<td>1.00</td>
</tr>
<tr>
<td>D–</td>
<td>60 to less than 63</td>
<td>.67</td>
</tr>
<tr>
<td>F</td>
<td>Less than 60</td>
<td>0</td>
</tr>
</tbody>
</table>

Additional information about grading can be found in the latest edition of the University Catalog, available at [http://www.regis.edu/Academics/Course%20Catalog.aspx](http://www.regis.edu/Academics/Course%20Catalog.aspx).

### CC&IS Policies and Procedures

Each of the following CC&IS Policies & Procedures is incorporated here by reference. Students are expected to review this information each term, and agree to the policies and procedures as identified here and specified in the latest edition of the University Catalog, available at [http://www.regis.edu/Academics/Course%20Catalog.aspx](http://www.regis.edu/Academics/Course%20Catalog.aspx) or at the link provided.

- The CC&IS Academic Integrity Policy.
- The Student Honor Code and Student Standards of Conduct.
- Incomplete Grade Policy, Pass / No Pass Grades, Grade Reports.
- The Information Privacy policy and FERPA. For more information regarding FERPA, visit the [U.S. Department of Education](http://www.ed.gov)
- The HIPAA policies for protected health information. The complete Regis University HIPAA Privacy & Security policy can be found here: [http://www.regis.edu/About-Regis-University/University-Offices-and-Services/Auxiliary-Business/HIPAA.aspx](http://www.regis.edu/About-Regis-University/University-Offices-and-Services/Auxiliary-Business/HIPAA.aspx).

The CC&IS Policies & Procedures Syllabus Addendum summarizes additional important policies including, Diversity, Equal Access, Disability Services, and Attendance & Participation that apply to every course offered by the College of Computer & Information Sciences at Regis University. A copy of the CC&IS Policies & Procedures Syllabus Addendum can be found here: [https://in2.regis.edu/sites/ccis/policies/Repository/CCIS%20Syllabus%20Addendum.docx](https://in2.regis.edu/sites/ccis/policies/Repository/CCIS%20Syllabus%20Addendum.docx).