IT 341  Data Communications and Networking Principles

Syllabus  (Revised 6/26/2016)

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             Room 101, Bull Run Hall (PW campus)
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GTA:  Pramod Sonowan
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Phone: TBD
Email: psonawan@masonlive.gmu.edu

Prerequisites:
((IT 101 and IT 212) or IT 105) and (IT 106 or IT 196 or CS 112) and (MATH 108 or MATH 113)

Lecture Textbooks:

Lab Textbooks:
• Introduction to Networks (Lab Manual), Cisco Press, ISBN: 1587133121

Slides:
Class lectures

Course Materials at:
https://mymasonportal.gmu.edu
Description:

This course focuses on the primary aspects of data communications networking, including a study of the Open Systems Interconnection (OSI) and Internet models. Students will start at Layer 1 with the study of various Layer 1 interface and cabling configurations. They will construct and test various cables with connectors. Moving up the OSI layers, students will focus on IP network addressing, network design, and enhanced hands-on router and port configurations. Switch configuration like creation and management of VLANs are covered. They will also learn security protocols and do static routing, RIPv2, and OSPF configurations. Concentration on layers 4 through 7 include studying TCP, UDP, data reliability, and error correction methods, on the ladder to the FTP, HTTP, SMTP, DNS, and TFTP protocols of Layer 7. Half of this course entails lab work where students design networks, configure routers and switches, engages in implementation and testing of networking devices.

Course Learning Outcomes:

You will learn the following after successful completion of this course:

- Understand the OSI Model
- Describe LAN and WAN designs
- Configure static and dynamic routes
- Design basic routing architecture
- Configure router from scratch by applying IOS CLI commands
- Configure IP addresses
- Configure port security
- Understand Ethernet principles
- Understand IP principles
- Understand TCP principles
- Understand TCP/IP Internet Model
- Understand IP addressing and sub-netting
- Describe all types of WAN technologies
- Describe all types of transmission physical media
- Be able to build IP addressing configuration using CIDR and VLSM
- Be able to troubleshoot all network common problems

Grading:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>Homework</td>
<td>10%</td>
</tr>
<tr>
<td>NetAcad Online Exams</td>
<td>10%</td>
</tr>
<tr>
<td>Lab Work</td>
<td>35%</td>
</tr>
<tr>
<td>Skills Exams</td>
<td>10%</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>15%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>20%</td>
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</tbody>
</table>

Grades will be awarded in accordance with the GMU Grading System for undergraduate students. For details, refer to: [http://catalog.gmu.edu/content.php?catoid=27&navoid=5399#undergrad](http://catalog.gmu.edu/content.php?catoid=27&navoid=5399#undergrad)

GMU does not dictate a grading scale: [https://registrar.gmu.edu/topics/grading-scale/](https://registrar.gmu.edu/topics/grading-scale/)

This course uses the grading scale below but the scale may vary at instructor’s discretion.
Grading Scale:

- 97 – 100% → A+
- 93 – 96% → A
- 90 – 92% → A-
- 87 – 89% → B+
- 83 – 86% → B
- 80 – 82% → B-
- 76 – 79% → C+
- 70 – 75% → C
- 60 – 69% → D
- 0 – 59% → F

Raw scores may be adjusted by the Instructor to calculate final grades.

Homework Assignments, Lab Sessions & NetAcad Final Exam:

Homework assignments and lab sessions are in Blackboard, and online Introduction to Networks and Routing & Switching Essentials final exams are at the Cisco Networking Academy (NetAcad) website. Each homework assignment and lab session will be released for viewing on the 1st day of the week it is due. Late homework assignment and lab session, and missed NetAcad final exams will not be accepted – if accepted, a penalty will be applied. Acceptance of late homework assignment and lab session, and retake of missed online NetAcad exams will be at the sole discretion of the Instructor.

Midterm Exam:

The midterm exam will cover materials discussed up to Session 6. The midterm exam will be “closed book”– no reference materials will be permitted.

Final Exam:

The final exam will cover materials discussed primarily during Sessions 7 thru 14. The final exam will be “closed book”– no reference materials will be permitted. Final exams are retained by the IST Department and are not returned to students.

Schedule (Subject to Change):

<table>
<thead>
<tr>
<th>Session</th>
<th>Content</th>
<th>Reading, Assignments &amp; Labs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ch 1 - Exploring The Network (Introduction to Networks Companion Guide)</td>
<td></td>
</tr>
<tr>
<td>Week of June 5th</td>
<td>Ch 2 - Configuring a Network Operating System (Introduction to Networks Companion Guide)</td>
<td>Released on: June 5th, 2016</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Lab Session 1 Released</td>
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</tbody>
</table>
| Week | Ch 8 – IP Addressing Part I (IPv4) (Introduction to Networks Companion Guide) | Ch 9 – Subnetting IP Networks (Introduction to Networks Companion Guide) | Released on: June 5\(^{th}\), 2016
- Home Assignment 1 Released |
|------|-----------------------------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| 3    | Ch 8 – IP Addressing Part II (IPv6) (Introduction to Networks Companion Guide) | Ch 3 - Network Protocols and Communications (Introduction to Networks Companion Guide) | Released on: June 12\(^{th}\), 2016
- Home Assignment 2 Released |
| 4    | Ch 4 - Network Access (Introduction to Networks Companion Guide)              | Ch 5 – Ethernet (Introduction to Networks Companion Guide)                | Released on: June 12\(^{th}\), 2016
- Lab Session 2 Released |
| 5    | Ch 6 - Network Layer (Introduction to Networks Companion Guide)              | Ch 10 - Transport Layer (Introduction to Networks Companion Guide)       | Released on: June 19\(^{th}\), 2016
- Lab Session 3 Released |
- Lab Session 3 Due
- Skill Based Assessment 1 |
| 7    | Midterm Exam in class on Tuesday June 28\(^{th}\) from 4:30pm-6:00pm in Room 129 Planetary Hall | | Released & Due on: June 26\(^{th}\), 2016
- Cisco NetAcad Online Final Exam 1 |
|      |                                                                             |                                                                          | Released on: June 26\(^{th}\), 2016
- Lab Session 4 Released |
<table>
<thead>
<tr>
<th>Week</th>
<th>Content and Dates</th>
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</thead>
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| 8    | Week of June 26<sup>th</sup>  
Ch 1 – Introduction to Switched Networks (Routing and Switching Essentials Companion Guide)  
Ch 2 – Basic Switching Concepts and Configuration (Routing and Switching Essentials Companion Guide)  
Due: June 28<sup>th</sup>, 2016  
• Discussion Forum 1  
Due: July 2<sup>nd</sup>, 2016  
• Lab Session 4 Due |
| 9    | Week of July 3<sup>rd</sup>  
Ch 3 – VLANs (Routing and Switching Essentials Companion Guide)  
Released on: July 3<sup>rd</sup>, 2016  
• Lab Session 5 Released  
• Lab Session 6 Released |
| 10   | Week of July 3<sup>rd</sup>  
Ch 4 – Routing Concepts (Routing and Switching Essentials Companion Guide)  
Due: July 9<sup>th</sup>, 2016  
• Lab Session 5 Due  
• Lab Session 6 Due |
| 11   | Week of July 10<sup>th</sup>  
Ch 5 – Inter-VLAN Routing (Routing and Switching Essentials Companion Guide)  
Ch 6 – Static Routing (Routing and Switching Essentials Companion Guide)  
Released on: July 10<sup>th</sup>, 2016  
• Lab Session 7 Released  
• Lab Session 8 Released  
• Discussion Forum 2 |
| 12   | Week of July 10<sup>th</sup>  
Ch 7 – Routing Dynamically (Routing and Switching Essentials Companion Guide)  
Ch 8 – Single-Area OSPF (Routing and Switching Essentials Companion Guide)  
Due: July 16<sup>th</sup>, 2016  
• Lab Session 7 Due  
• Lab Session 8 Due  
• Discussion Forum 2 |
| 13   | Week of July 17<sup>th</sup>  
Ch 9 – Access Control Lists (Routing and Switching Essentials Companion Guide)  
Ch 10 – DHCP (Routing and Switching Essentials Companion Guide)  
Released on: July 17<sup>th</sup>, 2016  
• Lab Session 9 Released  
• Lab Session 10 Released  
• Discussion Forum 3 |
| 14   | Week of July 17<sup>th</sup>  
Ch 11 – Network Address Translation to IPv4 (Routing and Switching Essentials Companion Guide)  
Due: July 23<sup>rd</sup>, 2016  
• Lab Session 9 Due  
• Lab Session 10 Due  
• Discussion Forum 3  
Released on: July 20<sup>th</sup>, 2016  
• Lab Session 11 Released  
• Lab Session 12 Released  
Released on: July 23<sup>rd</sup>, 2016  
• Skill Based Assessment 2  
• Final review |
| 15   | Week of July 24<sup>th</sup>  
Final Exam in class on Friday July 29<sup>th</sup> from 4:30pm-6:00pm in Room 129 Planetary Hall  
Due on: July 28<sup>th</sup>, 2016  
• Lab Session 11 Due  
• Lab Session 12 Due  
• Skill Based Assessment 2  
Released & Due on: July 27<sup>th</sup>, 2016  
• Cisco NetAcad Online Final Exam 2 |
The reading assignment(s) shown for each lecture is/are to be completed prior to that lecture.

This schedule is subject to revision before and throughout the course.

Registered students should see the Blackboard Learning System for the latest class schedule.

Important Dates

<table>
<thead>
<tr>
<th>Event</th>
<th>Details</th>
</tr>
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<tbody>
<tr>
<td>Last day to add classes:</td>
<td>Refer to the link below</td>
</tr>
<tr>
<td>Final drop deadline with 67% tuition penalty:</td>
<td>Refer to the link below</td>
</tr>
<tr>
<td>Last day of classes:</td>
<td>Refer to the link below</td>
</tr>
</tbody>
</table>

http://registrar.gmu.edu/calendars/summer/

Religious Holidays

A list of religious holidays is available on the University Life Calendar page. Any student whose religious observance conflicts with a scheduled course activity must contact the Instructor at least 1-week in advance of the conflict date in order to make alternative arrangements.

Attendance Policy

Departmental policy requires students to take exams at the scheduled time and place, unless there are truly compelling circumstances supported by appropriate documentation. Except in such circumstances, failure to attend a scheduled exam will result in a score of zero (0) for that exam, in accordance with Mason policy on final exams. Students should not make travel plans or other discretionary arrangements that conflict with scheduled classes and/or exams. If the University is closed due to weather or other unforeseen conditions, final exams may be rescheduled – students are strongly advised not to make plans that would prevent them from attending exams that may be rescheduled during the entire exam period.

Communications

Registered students will be given access to a section of the Blackboard Learning System for this course. Blackboard will be used as the primary mechanism to disseminate course information, including announcements, lecture slides, homework and other assignments, and scores for homework and exams.

Communication with the Instructor on issues relating to the individual student should be conducted using GMU email, via telephone, or in person - not in the public forums on Blackboard. GMU email is the preferred method – for urgent messages, you should also attempt to contact the Instructor via telephone. Federal privacy law and GMU policy require that any communication with a student related in any way to a student's status be conducted using secure GMU systems – if you use email to communicate with the Instructor you MUST send messages from your GMU email account.

Lecture slides are complements to the lecture process, not substitutes for it - access to lecture slides will be provided in Blackboard.
All course materials (lecture slides, assignment specifications, etc.) are published on Blackboard. This allows users of most computing platforms to view and print these files. Microsoft® Word (or a compatible word processing application) is required for preparing assignments – it is available on computers in the Mason open labs.

**Privacy**

Instructors respect and protect the privacy of information related to individual students. Issues relating to an individual student will be discussed via email, telephone or in person. Instructors will not discuss issues relating to an individual student with other students (or anyone without a need to know) without prior permission of the student.

Assessable work other than final exams will be returned to individual students directly by the Instructor (or by a faculty or staff member or a Teaching Assistant designated by the Instructor or via another secure method). Under no circumstances will a student's graded work be returned to another student.

Faculty and staff will take care to protect the privacy of each student's scores and grades.

**Disability Accommodations**

The Office of Disability Services (ODS) works with disabled students to arrange for appropriate accommodations to ensure equal access to university services. Any student with a disability of any kind is strongly encouraged to register with ODS as soon as possible and take advantage of the services offered.

Accommodations for disabled students must be made in advance – ODS cannot assist students retroactively, and at least one week's notice is required for special accommodations related to exams. Any student who needs accommodation should contact the Instructor during the first week of the semester so the sufficient time is allowed to make arrangements.

**Honor Code**

All members of the Mason community are expected to uphold the principles of scholarly ethics. Similarly, graduating students are bound by the ethical requirements of the professional communities they join. The ethics requirements for some of the communities relevant to IT graduates are available via the following links:

- [ACM Code of Ethics and Professional Conduct](#)
- [IEEE Code of Ethics](#)

On admission to Mason, students agree to comply with the requirements of the [GMY Honor System and Code](#). The Honor Code will be strictly enforced in this course. Honor Code cases are heard by a panel consisting of students – students who meet the requirements are encouraged to nominate themselves to serve on the Honor Committee.

Any use of the words or ideas of another person(s), without explicit attribution that clearly identifies the material used and its source in an appropriate manner, is plagiarism and will not be tolerated. The Instructor reserves the right to use manual and/or automated means (including such services as [Turnitin.com](#)) to detect plagiarism in any work submitted by students for this course, and to direct Teaching Assistants and/or other faculty and/or staff members to do likewise in support of this course.

For this course, the following requirements are specified:
All assessable work is to be prepared by the individual student, unless the Instructor explicitly directs otherwise.

All work must be newly created by the individual student for this course for this semester.

Any usage of work developed for another course, or for this course in a prior semester, is strictly prohibited without prior approval from the instructor.

Students may seek assistance with assigned work (and are encouraged to do so if they feel the need), provided:

- The directions for the assigned work do not prohibit such assistance.
- Such assistance is acknowledged in the submitted work, clearly identifying the person(s) giving assistance and the nature of the assistance given.
- Any work to be submitted is prepared entirely and exclusively by the student submitting it. Students are expressly prohibited from sharing any assessable work for this course in any manner with other students (except students assigned as Teaching Assistants to this course and the student's section), unless all students involved have had their work graded and returned by the Instructor, or the Instructor has explicitly approved such sharing.