COURSE SYLLABUS

Net 240: Advanced TCP/IP

**Course Description**

This course provides students with an advanced understanding of the TCP/IP Protocol suite. This class offers in-depth coverage of all the relevant models, protocols, services and standards that govern TCP/IP. Students will discuss and perform hands on projects that provide firsthand experience in setting up and configuring the various TCP/IP services. Students will learn IP addressing, subnetting, supernetting and CIDR notation.

General Course Information

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| Number of Units/Weeks | 4/10 |
| #Hours Lecture/#Hours Homework | 40/0/80 |
| Prerequisite(s) | None |
| Co-requisite(s) | None |
| Course Developer(s) | Robert Scott |
| Date Approved / Last Review | April 2015/ March 2018 |

**Learning Outcomes**

Upon completion of the course, students will be able to:

* Identify protocols and services built into IPv4 and IPv6.
* Identify and implement IPv4 addressing, subnetting, supernetting and CIDR notation.
* Identify and implement IPv6 Addressing and Subnetting.
* Identify the Packet structure for IPv4.
* Identify the Packet structure for IPv6.
* Identify the TCP/IP layers for IPv4 and IPv6.
* Identify the functions performed at each layer.
* Capture and decipher IPv4 and IPv6 packets using Wireshark.
* Troubleshoot TCP/IP services and network problems.

**Instruction Methods Employed in this Course**

A number of instructional/learning methods are employed in this course, including:

* Lecture and reading assignments
* Hands-on exercises and labs
* Team environment, group discussions
* Build on prior knowledge and experience of students to enhance richness of class activities

**Table for Assignments**

**Lecture**

Considered Lecture Hours

**Classroom Discussion**

Considered Lecture Hours

**In Class Critique**

Considered Lecture Hours

**Delivering Oral Presentations**

Considered Lecture Hours

**In Class (IC) Exercises**

Considered Lecture Hours

**Reading**

Considered Homework, work done outside of class

**WebClass lesson (non-online courses)**

Considered Homework, work done outside of class

**Quiz, Midterm or Final**

Considered Lecture Hours

**Information Resources for this Course**

**Textbook**

Chappel, Laura, Tittel, Ed Guide to TCP/IP Fourth Edition, Thompson Course

Technology 2013 ISBN-13:978-1-133-01986-2

**Web Site Readings**

The TCP/IP Guide

[http://www.tcpipguide.com](http://www.tcpipguide.com/)

Protocols.com

<http://www.protocols.com/pbook/tcpip1.htm>

T. Socolofsky RFC 1180 TCP/IP Tutorial

http://tools.jetf.org/html/rfc1180  
 TCP/IP Tutorial and Technical Overview, IBM Redbook

<http://www.redbooks.ibm.com/redbooks/pdfs/gg243376.pdf>

IPv6 Tutorial

[http://archive.icann.org/en/meetings/saopaulo/presentation-ipv6-tutorial-basics 3dec06.pdf](http://archive.icann.org/en/meetings/saopaulo/presentation-ipv6-tutorial-basics%203dec06.pdf)

IPv6 Tutorials Internet Society

http://www.internetsociety.org/deploy360/ipv6/?gclid=CKTp79PvjMQCFZeVfg

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| Week 1 |  |  |  |  |  |  |
| Type | Topic/Description | LEC Hours | ICA  Hours | HW  Hours | Point  Value | Due |
| LEC 1A | Ch. 1 Introducing TCP/IP  OSI Model & TCP/IP Model  Ch. 3 Basic IP Packet Structure  Headers and Payloads | 3 |  |  |  |  |
| HW 1A | Read Chapter 1, 2, & 3 Pages 1 - 108 (108 pgs.  Evaluated by Quiz 1 Week 3 |  |  | 11 |  | Quiz 1 Week 3 |
| HW 1B | Chapter 1, 2, & 3 (75 Questions) |  |  | 5 |  | Week 2 |
| HW 1C | Assign 10 Page Paper on Securing IP networks |  |  | 5 |  | Week 9 |
| ICA 1A | Project 1.1 - 1.7 pg. 44 |  | 1 |  | 20 |  |
| Total |  | 3 | 1 | 21 | 20 |  |

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| Week 2 |  |  |  |  |  |  |
| Type | Topic/Description | LEC Hours | ICA  Hours | HW  Hours | Point  Value | Due |
| LEC 2A | Ch. 2 IP Addressing IPv4 & IPv6 | 3 |  |  |  |  |
| HW 2A | Read Ch. 4 Data Link and Network Layers  Pgs. 57 - 93 (44 pgs.)  Evaluated by Quiz 1 Week 3 |  |  | 4.4 |  | Quiz 1 Week 3 |
| HW 2B | Ch. 4 (25 questions) |  |  |  |  | Week 3 |
| HW 2C | Ch. 1, 2 & 3 Questions due |  |  |  | 30 |  |
| HW 2D | Assign Subnetting Package  Evaluated by Quiz 2 Week 4 |  |  |  | 35 | Week 4 |
| ICA2 | Project 2.1 - 2.7 pg. 101  Project 3.1 - 3.3 pg. 149 |  | 1 |  | 40 |  |
| Total |  | 3 | 1 | 4.4 | 105 |  |

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| Week 3 |  |  |  |  |  |  |
| Type | Topic/Description | LEC Hours | ICA  Hours | HW  Hours | Point  Value | Due |
| LEC 3A | Ch. 4 Data Link and Network Layer Protocols | 2.5 |  |  |  |  |
| HW 3A | Read Ch. 5 & 6 Pgs. 253 – 370  Evaluated by Quiz 2 Week 4 |  |  | 12 |  | Quiz 2 Week 4 |
| HW 3B | Ch. 5 & 6 (50 quest) |  |  | 4 |  | Week 4 |
| HW 3C | Ch. 4 questions due |  |  |  | 10 |  |
| ICA 3A | Quiz 1 IP Headers and Question |  | .5 |  | 35 |  |
| ICA 3B | Project 4.1 - 4.4 pg. 245 |  | 1 |  | 20 |  |
| Total |  | 2.5 | 1.5 | 16 | 65 |  |

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| Week 4 |  |  |  |  |  |  |
| Type | Topic/Description | LEC Hours | ICA  Hours | HW  Hours | Point  Value | Due |
| LEC 4A | Ch. 5 Internet Control Message Protocol IPv4  Ch. 6 Neighbor Discovery  in IPv6 | 2.0 |  |  |  |  |
| HW 4A | Read Ch. 7 pg. 371 – 438  Evaluated by Quiz 3 Week 6 |  |  | 7 |  | Quiz 3 Week 6 |
| HW 4B | R.Q. Ch. 7 (25 Quest) |  |  | 2 |  | Week 5 |
| HW 4C | Ch. 5 & 6 quest. due |  |  |  | 20 |  |
| ICA 4A | Quiz 2 Subnetting & Questions |  | .5 |  | 30 |  |
| ICA 4C | Project 5.1 - 5.4 pg. 315  Project 6.1 - 6.4 pg. 364 |  | 1 |  | 40 |  |
| Total |  | 2.0 | 2.0 | 9 | 90 |  |

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| Week 5 |  |  |  |  |  |  |
| Type | Topic/Description | LEC Hours | ICA  Hours | HW  Hours | Point  Value | Due |
| Midterm Exam | Midterm Exam Ch. 1 -6 | 1 |  |  | 160 |  |
| LEC 5A | CH. 7 Services Address Auto configuration | 2 |  |  |  |  |
| HW 5A | Read Ch. 8 pgs. 441 - 512  Evaluated by Quiz 3 Week 6 |  |  | 8 |  | Quiz 3 Week 6 |
| HW 5B | Ch. 8 (25 quest) |  |  | 2 |  | Week 6 |
| HW 5C | Turn in Ch. 7 questions |  |  |  | 10 |  |
| ICA 5A | Project 7.1 – 7.4 pg. 435 |  | 1 |  | 20 |  |
| Total |  | 3 | 1 | 10 | 190 |  |

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| Week 6 |  |  |  |  |  |  |
| Type | Topic/Description | LEC Hours | ICA  Hours | HW  Hours | Point  Value | Due |
| LEC 6A | Ch. 8 Services Name Resolution | 2.5 |  |  |  |  |
| HW 6A | Read Ch. 9 & 10 pgs. 513 – 613  Evaluated by Quiz 4 Week 7 |  |  | 10 |  | Quiz 4 Week 7 |
| HW 6B | Ch. 9 & 10 (50 Questions) |  |  | 4 |  | Week 7 |
| HW 6C | Turn in Ch. 8 Questions |  |  |  | 10 |  |
| HW 6D | Assign VLSM Package Evaluated by Quiz 5 Week 9 |  |  |  | 50 | Quiz 5 Week 9 |
| ICA 6A | Quiz 3 Ipv6 Header & Questions |  | .5 |  | 20 |  |
| ICA 6B | Project 8.1 – 8.6 pg. 504 |  | 1 |  | 20 |  |
| Total |  | 3 | 1.5 | 14 | 100 |  |

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| Week 7 |  |  |  |  |  |  |
| Type | Topic/Description | LEC Hours | ICA  Hours | HW  Hours | Point  Value | Due |
| LEC 7A | Ch. 9 Transport Layer Protocols  Ch. 10 Transitioning from Ipv4 to IPv6 | 3 |  |  |  |  |
| HW 7A | Read Ch. 11 pg. 615 – 658  Evaluated by Quiz 5 Week 9 |  |  | 5 |  | Quiz 5 Week 9 |
| HW 7B | Ch. 11 (25 questions) |  |  | 2 |  | Week 8 |
| HW7c | Turn in Ch. 9 & 10 questions |  |  |  | 20 |  |
| ICA 7A | Quiz 4 Questions |  |  |  | 10 |  |
| ICA 7B | Project 9.1 – 9.3 pg. 557  Project 10.1 – 10.3 pg. 609 |  | 1 |  | 40 |  |
| Total |  | 3 | 1 | 7 | 60 |  |

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| Week 8 |  |  |  |  |  |  |
| Type | Topic/Description | LEC Hours | ICA  Hours | HW  Hours | Point  Value | Due |
| LEC 8A | Ch. 11 Deploying Ipv6 | 3 |  |  |  |  |
| HW 8A | Read Ch. 12 pgs. 659 – 696  Evaluated by Quiz 5 Week 9 |  |  | 4 |  | Quiz 5 Week 9 |
| HW 8B | Ch. 12 (25 questions) |  |  | 2 |  |  |
| HW 8C | Turn in Ch. 11 questions |  |  |  | 10 |  |
| ICA 8A | Project 11.1 – 11.2 pg. 653 |  | 1 |  | 20 |  |
| Total |  | 3 | 1 | 6 | 30 |  |

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| Week 9 |  |  |  |  |  |  |
| Type | Topic/Description | LEC Hours | ICA  Hours | HW  Hours | Point  Value | Due |
| LEC 9A | Ch. 12 Securing TCP/IP Environment | 2 |  |  |  |  |
| HW 9A | Turn in Ch. 12 questions |  |  |  | 20 |  |
| HW 9B | Turn in Paper Securing IP Network |  |  |  | 90 |  |
| ICA 9B | Quiz 5 VLSM & Questions |  | .5 |  | 30 |  |
| ICA 9C | Project 12.1 – 12.4 pg. 693 |  | 1 |  | 20 |  |
| Total |  | 2 | 2 |  | 160 |  |

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| Week 10 |  |  |  |  |  |  |
| Type | Topic/Description | LEC Hours | ICA  Hours | HW  Hours | Point  Value | Due |
| LEC 10A | Review | 2 |  |  |  |  |
| Final Exam | Chapter 7 - 12 |  | 2 |  | 170 |  |
| Total |  | 2 | 2 |  | 170 |  |

**Your Grades for this Course**

Your final grade for this course will be based on an assessment by the Instructor of your performance on a number of course activities, which, may include objective tests, classroom exerciser, laboratory demonstrations, project papers, or other types of activities. The chart below indicates in what activities you will engage, how many possible points can be earned for each activity, and the percentage of you final grade that will be accounted for by each activity.

**Table/Point Breakdown**

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| --- | --- | --- | --- |
| Week | Assignment | Points | Percentage |
| 1 | Project 1.1 - 1.7 | 20 | 2 |
| 2 | Ch. 1, 2 & 3 Questions | 30 | 3 |
| 2 | Subnetting Package | 35 | 3.5 |
| 2 | Project 2.1 - 2.7 pg. 101  Project 3.1 - 3.3 pg. 149 | 40 | 4 |
| 3 | Chapter 4 questions | 10 | 1 |
| 3 | Quiz 1 IP Headers & Questions | 35 | 3.5 |
| 3 | Project 4.1 - 4.4 | 20 | 2 |
| 4 | Chapter 5 & 6 questions | 20 | 2 |
| 4 | Quiz 2 Subnetting & Questions | 30 | 3 |
| 4 | Project 5.1 - 5.4  Project 6.1 - 6.4 | 40 | 4 |
| 5 | Midterm Exam | 160 | 16 |
| 5 | Chapter 7 questions | 10 | 1 |
| 5 | Project 7.1 – 7.4 | 20 | 2 |
| 6 | Chapter 8 questions | 10 | 1 |
| 6 | VLSM Package | 50 | 5 |
| 6 | Quiz 3 Ipv6 Headers | 20 | 2 |
| 6 | Project 8.1 – 8.6 | 20 | 2 |
| 7 | Chapter 9 & 10 questions | 20 | 2 |
| 7 | Quiz 4 Questions | 10 | 1 |
| 7 | Project 9.1 – 9.3  Project 10.1 – 10.3 | 40 | 4 |
| 8 | Chapter 11 questions | 10 | 1 |
| 8 | Project 11.1 – 11.2 | 20 | 2 |
| 9 | Quiz 5 VLSM & Questions | 30 | 3 |
| 9 | Chapter 12 questions | 20 | 2 |
| 9 | Security Paper | 90 | 9 |
| 9 | Project 12.1 – 12.4 | 20 | 2 |
| 10 | Final Exam | 170 | 17 |
| Total |  | 1000 | 100 |

Students in this course should be graded following Coleman University assessment practices and policies. A point system is used in the University to indicate student performance on various required activities or projects. For this course, it is recommended that points be distributed as follows:

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| Pecent | Letter Grade | Grade Points |
| 940-1000 | A | 4 |
| 900-930 | A- | 3.67 |
| 870-890 | B+ | 3.33 |
| 940-860 | B | 3 |
| 800-830 | B- | 2.67 |
| 770-790 | C= | 2.33 |
| 740-760 | C | 2 |
| 700-730 | C- | 1.67 |
| 690-670 | D+ | 1.33 |
| 640-660 | D | 1 |
| 600-630 | D- | 0.67 |
| N/A | INC | 0 |
| N/A | W | 0 |
| N/A | CR | 0 |
| 590 or below | F | 0 |
| N/A | PASS | 0 |

**Requirements**

**Assignments**: All assignments (including projects, lab work, quizzes and exams) must be completed as scheduled. The following will apply to late assignments

* 1-24 hours after due date = 20% off point value
* 25-48 hours after due date = 60% off point value
* 49+ hours after due date = No points given

If an assignment equals less that 5 points, no points will be given for late work. If there are extenuating circumstances, the student must submit a written explanation to the department Senior Instructor. Upon evaluation, points will be given according to the Senior Instructor's discretion.

**Attendance:**

Classes begin and end as indicated in the published schedule. It is required that students be present at the beginning of each class session and stay until class is dismissed, including lab periods. Excessive tardiness, leaving early and/or absences (from either lecture or lab sessions) are casuses for dismissal from the course. A student that arrives in class beyond 30 minutes late may be considered absent. A student that leaves over 30 minutes before the end of class may also be considered absent. Excused absences will be determined by the instructors and approved by the Dean of Academics & Director of Student Services. Students may be removed from the course(s) based on the following absence guidelines:

* 4 Unit Course – Allowed 2 absences per 10-week MOD (3rd absence may be excused by DOA & DOSS)
* 5 Unit Course – Allowed 2 absences per 5-week MOD (3rd absence may be excused by DOA & DOSS)
* 8 Unit Course – Allowed 5 absences per 10-ween MOD (6th absence may be excused by DOA & DOSS)

**Conduct**: Students are expected to conduct themselves in a professional manner while on campus. Rules of conduct are outlined in the University Catalog and students are required to adhere to such policies. Students who are in violation of the Student Code of Conduct Policy can be suspended.

**Coleman University Policy on Academic Dishonesty**

Academic dishonesty is cause for dismissal from Coleman University. Presenting another person's ideas, methods, course work, or test answers with the intention that they be taken as one's own is theft of a special kind. It defrauds the originator of the work, the institution, its graduates, its students, and its future students.

The student has full responsibility for the authenticity of all academic work and examinations submitted. A student who appears to have violated this policy must submit to a hearing with the reporting instructor and the associate dean. If it is determined that a violation occurred, the matter will be referred to an Officer of the University with recommendations for an appropriate penalty. The student may be dismissed, suspended, or given another penalty.

Coleman University employs the plagiarism software known as Turnitin. Students are expected to use this tool in an appropriate manner with the sole purpose to support their own academic endeavors at Coleman University. Turnitin account information cannot be shared with anyone. Contact your instructor if you have any questions about plagiarism related issues.

**Academic Accommodation/Adjustment Policy:**

In accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA), Coleman University offers accommodations to students with documented physical, psychological, and/or cognitive disabilities. Coleman University will adhere to all applicable federal, state, and local laws, regulations and guidelines with respect to providing reasonable accommodations as required to offer equal educational opportunities to qualified disabled individuals.

To qualify for an academic accommodation under ADA, the student must provide adequate documentation of a disability. Students seeking academic accommodations should contact the campus ADA coordinator, Ariana Marron, at 858-966-3953 or via email at [ada@coleman.edu](mailto:ada@coleman.edu). The ADA Coordinator at the beginning of every term to determine the appropriate academic accommodations. Failing to meet with the ADA Coordinator at the beginning of every term may impact the availability of accommodations.

After the academic accommodations have been determined, the students' instructors will be notified by the ADA Coordinator. If any problems or concerns regarding the provision of accommodations occur, the student must inform the ADA Coordinator. If the student feels accommodation is not being made appropriately, the student may follow the published Student Grievance Procedures.