TCOM 555 Network Management and Design
Department of Electrical and Computer Engineering
George Mason University
Fall, 2008

Syllabus revised 2008/06/02

Administrative Information

Instructor:
Dr. Aleksandar Lazarevich

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Office hours: By appointment

Teaching Assistant
UNK

Day/time of class: Thursday 4:30 - 7:10

Location: Innovation Hall, Room 209

Class section: 001

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Phone: 703-993-???
Office hours: see mason.gmu.edu/~???

Course Description

555 Network Management Foundations and Applications (3.0:3.0:0) Prerequisites: TCOM 500, 501, and 502. Defines and explains techniques that network managers utilize to maintain and improve performance of telecommunications network; network management system; five tasks traditionally involved with network management (fault management, configuration management, performance management, security management, and accounting management); theoretical background in transmission systems sufficient to understand network parameters such as capacity and response times; and specific network management products. Also explores how network performance data should be used for management and when considering upgrades in network architecture.

Course Objectives
At the conclusion of this course, students should be able to:

1. Explain network management key terminology, definitions and concepts.
2. Identify and define the major functions and interrelationships of each network management task area as a process.
3. Specify criteria for the choice and implementation of a network management system.
4. Identify and contrast competing current network management products.
5. Identify and specify the elements of network design.

Textbooks


Grading

Raw scores may be adjusted to calculate final grades.

Grades will be assessed on the following components:

Homeworks (5@10% each) 50%
Mid-term exam 25%
Final exam 25%

These components are outlined in the following sections.

Homework

Homework 1 – In a 3-4 page paper, discuss the need and potential costs of implementing an automated network management solution for a large enterprise network. How do these costs compare to decentralized network management? Utilize current articles from the web as well as other sources. You should have at least four sources without the text. Use proper citations and keep in mind the rules for plagiarism. No more than a third of the paper may be quotes.

Homework 2 – In a 3-4 page paper, discuss how extensive the monitoring should be for a large enterprise network. What are the trade-offs (cost, overhead, storage space, computational power) that must be addressed and their impact? Utilize current articles from the web as well as other sources. You should have at least four sources without the text. Use proper citations and keep in mind the rules for plagiarism. No more than a third of the paper may be quotes.

Homework 3 – In a 3-4 page paper, discuss how performance optimization and security impact each other for a large enterprise network. What are the trade-offs that must be addressed and their impact? Utilize current articles from the web as well as other sources. You should have at least four sources without the text. Use proper
citations and keep in mind the rules for plagiarism. No more than a third of the paper may be quotes.

**Homework 4** – In a 3-4 page paper, discuss the value of flow analysis for a large enterprise network. What are the advantages and disadvantages? Utilize current articles from the web as well as other sources. You should have at least four sources without the text. Use proper citations and keep in mind the rules for plagiarism. No more than a third of the paper may be quotes.

**Homework 5** – In a 3-4 page paper, compare and contrast the two approaches in network management system design for a large enterprise network. What are the trade-offs that must be addressed and their impact? Utilize current articles from the web as well as other sources. You should have at least four sources without the text. Use proper citations and keep in mind the rules for plagiarism. No more than a third of the paper may be quotes.

Homework assignments are due in Weeks 4, 6, 9, 12, and 15. Late submissions will be assessed a penalty of 25% of the assignment grade for each week or part thereof it is late. No assignment will be accepted after three weeks.

**Mid-term exams**
The mid-term exam will be conducted during class time in Week 7 and will cover material discussed in Weeks 1-6. The mid-term exam will be “closed book” – no reference materials other than those provided with the exam paper will be permitted.

**Final exam**
The final exam will be held the week after the final class in the same room used for classes and will cover material from the weeks 9-15. The final exam will be “closed book” – no reference materials other than those provided with the exam paper will be permitted.

**Schedule**

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Reading Assignments</th>
<th>Projects Due</th>
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</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>8/28/2008</td>
<td>Net Mgmt Challenge &amp; Review of Net Elements and Services</td>
<td>Chapt 1 &amp; 2</td>
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<tr>
<td>Week 2</td>
<td>9/4/2008</td>
<td>Net Mgmt Problem</td>
<td>Chapt 3</td>
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<tr>
<td>Week 3</td>
<td>9/11/2008</td>
<td>Config and Ops</td>
<td>Chapt. 4</td>
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<tr>
<td>Week 4</td>
<td>9/18/2008</td>
<td>Fault Detection &amp; Correction</td>
<td>Chapt 5</td>
<td>Homework 1 due</td>
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<tr>
<td>Week 5</td>
<td>9/25/2008</td>
<td>Acctg and Billing</td>
<td>Chapt. 6</td>
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<tr>
<td>Week 6</td>
<td>10/2/2008</td>
<td>Performance &amp; Assessment</td>
<td>Chapt. 7</td>
<td>Homework 2 due</td>
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<tr>
<td>Week 7</td>
<td>10/9/2008</td>
<td>Mid-Term</td>
<td>Covers Chapt. 1-7</td>
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<td>Week 8</td>
<td>10/16/2008</td>
<td>Security</td>
<td>Chapt. 8</td>
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<tr>
<td>Week 9</td>
<td>10/23/2008</td>
<td>Mgmt tools &amp; Tech</td>
<td>Chapt. 9</td>
<td>Homework 3 due</td>
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<td>Week 10</td>
<td>10/30/2008</td>
<td>SNMP</td>
<td>Chapt. 10</td>
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<tr>
<td>Week 11</td>
<td>11/4/2008</td>
<td>Net Flow</td>
<td>Chapt. 11</td>
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<tr>
<td>Week 12</td>
<td>11/6/2008</td>
<td>Routing &amp; Traffic Engr.</td>
<td>Chapt. 12</td>
<td>Homework 4 due</td>
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<tr>
<td>Week 13</td>
<td>11/13/2008</td>
<td>Mgmt Scripting</td>
<td>Chapt. 13</td>
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<tr>
<td>Week 14</td>
<td>11/20/2008</td>
<td>Net Automation</td>
<td>Chapt. 14</td>
<td></td>
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<tr>
<td>Week 15</td>
<td>11/27/2008</td>
<td>Thanksgiving break</td>
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<td>Homework 5 due</td>
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<tr>
<td>Week 17</td>
<td>12/11/2008</td>
<td>Final exam</td>
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This schedule is subject to revision before and throughout the course.

Call 703–993–1000 for recorded information on campus closings (e.g. due to weather).

Important Dates

| Last day to add classes | TUE, SEP 11 |
| Last day to drop with no tuition liability | TUE, SEP 11 |
| Last day to drop | FRI, SEP 28 |

From [http://registrar.gmu.edu/calendars/Fall%202007%20Pdf%20Sched.pdf](http://registrar.gmu.edu/calendars/Fall%202007%20Pdf%20Sched.pdf)

See that Web page for more information.
Attendance Policy
Students are expected to attend each class, to complete any required preparatory work (including assigned reading) and to participate actively in lectures, discussions and exercises. As members of the academic community, all students are expected to contribute regardless of their proficiency with the subject matter.

Students are expected to make prior arrangements with Instructor if they know in advance that they will miss any class and to consult with the Instructor if they miss any class without prior notice.

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 may result in a grade of zero (0) for that exam.

Communications
Communication on issues relating to the individual student should be conducted using email or telephone. Email is the preferred method – for urgent messages, you should also attempt to contact the Instructor via telephone. Email messages from the Instructor to all class members will be sent to students' GMU email addresses – if you use another email account as your primary address, you should forward your GMU email to that account.

Lecture slides are complements to the lecture process, not substitutes for it - access to lecture slides will be provided as a courtesy to students provided acceptable attendance is maintained.

Honor Code
Students are required to be familiar and comply with the requirements of the [GMU Honor Code][1]. The Honor Code will be strictly enforced in this course.

All assessable work is to be completed by the individual student.

Students must NOT collaborate on the homework or exams without explicit prior permission from the Instructor.


"You plagiarize when, intentionally or not, you use someone else's words or ideas but fail to credit that person. You plagiarize even when you do credit the author but use his exact words without so indicating with quotation marks or block indentation. You also plagiarize when you use words so close to those in your source, that if you placed your work next to the source, you would see that you could not have written what you did without the source at your elbow" (p. 167).