CIS207 – Networking Foundations (Spring 2014)

TR 11:30 AM - 12:45 PM, Technology Center, Room 222
Dr. Thomas Lombardi, Assistant Professor of CIS

Contact Information
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COURSE FORMAT AND CREDIT HOURS
This course will be taught through a combination of lecture, demonstration, and group and individual exercises. Exams, projects and assignments will be submitted electronically and manually. This course has no prerequisites.

CIS207 fulfills the Analysis and Modeling requirement for the CIS major and minor. Analysis and Modeling courses engage students in using various tools and techniques for understanding problems and creating functional information technology solutions. Students will use methods from networking and related disciplines to test, evaluate, document and recommend solutions to real-world problems.

CIS207 fulfills the Social Science (SSC) breadth requirement in the W&J Curriculum. As such, this course discusses the role of human behavior and social structures in the development of human communities. In particular, the course explores network models capturing common features of human communities as well as network technologies promoting human communication.

COURSE DESCRIPTION AND OBJECTIVES
In this project-based course on networking, students develop the foundational knowledge and skills required to apply networking models and techniques to problems of data analysis in many disciplines. Students will use software to model, analyze, and visualize complex network systems.

After completing this course, students will develop the ability to:
- Understand and apply networking theories and concepts in diverse fields of study;
- Appreciate the networking and telecommunications infrastructure driving global economic, political, and social trends;
- Use professional networking tools to solve common problems of information processing;
- Identify the basic types of networks and understand the techniques used to determine their structure;
- Develop network models appropriate to specific knowledge domains;
- Analyze complex problems in a number of disciplines with network models;
- Enhance the analysis and comprehension of networks with visualization.

REQUIRED TEXTS


SUPPLEMENTAL READING
The instructor will introduce supplemental articles and readings during the course to emphasize key points or emerging issues. Consult Sakai for supplemental readings.
ASSIGNMENTS & GRADING POLICIES

Class Participation
You are expected to come to each class prepared to participate. Prepared students are those who have:
- read the assigned texts and reviewed the multimedia materials in Sakai prior to the class meeting;
- reviewed the notes in Sakai;
- studied the concepts to be discussed;
- collected questions regarding the material and the course.

In addition to these preparatory steps, I assume that you check your W&J Email at least once per day.

When you cannot attend class due to a conflict, I expect that you will contact me via your W&J Email as soon as possible. In the event of a major illness or other long-term conflict, please contact me immediately to make arrangements so that you do not fall behind in the class. Students needing to contact the instructor for any reason during the semester may do so by email, phone, or in person.

Students accrue participation points every day based on attendance and attentiveness to classroom activities. Students cannot make up missed classes, and therefore, they should consider attendance mandatory. Your presence in class is a necessary, but not a sufficient condition to earn participation points for a class. If students distract themselves or others from the planned activities for the day, those students will not receive participation points. Occasionally, a student will demonstrate outstanding participation and will be awarded additional participation points for this effort.

Quizzes
Quizzes are relatively straight-forward unannounced assessments delivered at random to verify that students are comprehending readings and course content. The quizzes are designed to reward students who regularly read and study the course content. Students cannot make up missed quizzes. Quizzes are closed book.

Homework Assignments
Homework assignments are designed to help students practice the core skills and review the important concepts of the course. Students should work on homework assignments individually.

Projects
The two projects ask students to build and analyze complex networks. These projects are largely self-directed and require students to work independently.

General Comments about Homework and Projects
- Late homework assignments and projects will be subject to a 5% deduction per day.
- Homework assignments and projects must be completed independently.
- Homework assignments and projects must be submitted manually and via Sakai.
- Homework assignments and projects are due by class time on the assignment due date.

Exams and Final Exam
All exams are comprehensive. Students may use books and notes for all exams, but I strongly encourage students to study for these exams as if they were closed book exams.

Summary of Graded Activities

<table>
<thead>
<tr>
<th>Activity</th>
<th>Occurrences</th>
<th>Points/Occurrence</th>
<th>Total Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participation</td>
<td>Every class</td>
<td>~5</td>
<td>120</td>
</tr>
<tr>
<td>Quizzes</td>
<td>~6</td>
<td>20</td>
<td>120</td>
</tr>
<tr>
<td>Assignments</td>
<td>6</td>
<td>20</td>
<td>120</td>
</tr>
<tr>
<td>Projects</td>
<td>2</td>
<td>60</td>
<td>120</td>
</tr>
<tr>
<td>Exams</td>
<td>2</td>
<td>120</td>
<td>240</td>
</tr>
<tr>
<td>Final Exam</td>
<td>1</td>
<td>280</td>
<td>280</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>1000</strong></td>
</tr>
</tbody>
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Point-to-Final Letter Grade Conversion
A >= 950 | A- >= 900 | B+ >= 880 | B >= 830 | B- >= 800 | C+ >= 780 | C >= 730 | C- >= 700 | D+ >= 680 | D >= 630 | D- >= 600 | F < 600
COMFORTABLE LEARNING ENVIRONMENT
Students with medical, psychological, learning or other disabilities desiring academic adjustments, accommodations, or auxiliary aids will need to contact the instructor. Students have the right to learn in a non-threatening environment that is free from intimidation or harassment. Shared resources such as computer labs or classroom computers must be kept free from offensive material. Students experiencing incidents which cause them to become uncomfortable should report these incidents to the instructor immediately. If the instructor is the source of intimidation or harassment, students should contact the department chair. As a courtesy to the instructor and to other students, please turn off electronic devices which may cause a distraction during class. Please do not allow your computer to become a distraction during class time — it is a tool for learning. Playing games, checking email, and instant messaging are not acceptable activities on the computers during class.

ACADEMIC HONESTY
The instructor assumes that each student has read the college's Academic Honesty Policy, which can be found online in the 2013-2014 College Catalog. The instructor assumes that a student's work represents a sincere attempt to engage with the course of study outlined for this class. Do not use the words of another without properly citing the source. All cases of academic misconduct will be handled according to the procedures defined in the Academic Honesty Policy. In this class you are NOT permitted to work together on assignments and projects.
## COURSE SCHEDULE

This course schedule outlines student responsibilities for each week of study, including all required activities which will be graded for that week. Details for successfully completing each graded activity are available in Sakai. Additional readings are listed in Sakai. This schedule may be revised.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics and Primary Readings</th>
<th>Graded Activities Due</th>
</tr>
</thead>
</table>
| Week 1  | R: Introduction to Networks/Network Types  
Readings: NCM, Ch. 1. |                               |
| Jan 30  | T: Graph Theory and Network Metrics  
Readings: ESNA, Ch. 1; NCM, Ch. 2.  
R: Network Structures: Weak Ties  
Readings: ESNA, Ch. 2; NCM, Ch. 3. |                               |
| Week 2  | T: Homophily and Community Structure  
Readings: NCM, Ch. 4.  
R: Homophily and Community Structure  
ESNA, Ch. 3 | Homework 1 due Feb 11 (T) |
| Feb 4 - 6 |                               |                               |
| Week 3  | T: Structural Balance and Signed Graphs  
Readings: ESNA, Ch. 4.  
R: Structural Balance and Signed Graphs  
Readings: ESNA, Ch. 4. | Homework 2 due Feb 18 (T) |
| Feb 11 - 13 |                               |                               |
| Week 4  | T: Core, Periphery, Brokers, Bridges  
Readings: ESNA, Chapter 7.  
R: Small World Theory  
Readings in Sakai. | Homework 3 due Feb 25 (T) |
| Feb 18 - 20 |                               |                               |
| Week 5  | T: Exam 1  
Readings: ESNA in Sakai. | Exam 1 on Mar 4 (T) |
| Feb 25 - 27 | R: Introduction to Technological Networks I  
Readings in Sakai. |                               |
| Week 6  | T: Technological Networks II | Project 1 due Mar 13 (R) |
| Mar 4 - 6 | R: Technological Networks III |                               |
| Week 7  | T: Affiliation Networks and Bipartite Graphs  
Readings: ESNA, Ch. 5-6.  
R: Affiliation Networks and Bipartite Graphs | Homework 4 due April 1 (T) |
| Mar 11 - 13 |                               |                               |
| Week 8  | T: Directed Networks  
Readings: ESNA, Ch. 9.  
R: Directed Networks  
Readings: NCM, Ch. 13. | Homework 5 due Apr 8 (T) |
| Mar 25 - 27 |                               |                               |
| Week 9  | T: Ranking  
Readings: ESNA, Ch. 10.  
R: Citation Analysis  
Readings: ESNA, Ch. 11. | Exam 2 on Apr 15 (T) |
| Apr 1 - 3 |                               |                               |
| Week 10 | T: Network Models: ER, WS, BA  
Readings in Sakai. | Homework 6 due Apr 24 (R) |
| Apr 8 - 10 |                               |                               |
| Week 11 | T: Advanced Topics in Networking  
Readings in Sakai. |                               |
| Apr 15 - 17 |                               |                               |
| Week 12 | T: Search and Navigation  
Readings: NCM, Ch. 14  
R: Routing and Mobility  
Readings in Sakai. |                               |
| Apr 22 - 24 |                               |                               |
| Week 13 | T: Advanced Topics in Networking  
Readings in Sakai. |                               |
| Apr 29 – May 1 |                               |                               |
| Week 14 | T: Final Exam: Friday, May 9th 2:00 – 5:00 PM | Project 2 due May 6 (T) |
| May 6 |                               |                               |