

**ITMO 440/540 - Introduction to Data Networking and the Internet**

**Faculty Information:**

**Professor:** Louis F. McHugh IV

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**Office Hours:** By Appointment

**Online Hours:**  via Skype by Appointment

**Applicability:**

This tentative syllabus will apply for Spring 2014 sections of ITO-440, ITMO-440/540

**Course Catalog Description:**

This course covers current and evolving data network technologies, protocols, network components, and the networks that use them, focusing on the Internet and related LANs. The state of worldwide networking and its evolution will be discussed. This course covers the Internet architecture, organization, and protocols including Ethernet, 802.11, routing, the TCP/UDP/IP suite, DNS, SNMP, DHCP, and more. Students will be presented with Internet-specific networking tools for searching, testing, debugging, and configuring networks and network-connected host computers. There will be opportunities for network configuration and hands-on use of tools. (2-2-3)

Graduate students are required to register for the 500-level section of this course.

**Prerequisites:**

There are no specific prerequisite courses.

**Credits:**

* ITM-enrolled students will receive, upon successful completion of the course, 3 semester hours of credit.
* ITO-enrolled students will receive; upon successful completion of the course will receive CEU’s.

**Lecture Day, Time, and Location:**

Monday 14:30—17:10

Room 155, 201 E Loop IIT Rice Campus—Wheaton, IL

This lecture time is controlled by IIT-ONLINE in that they will stream the lecture audio and video to Internet students, usually within 24 hours from the time of the end of the lecture.

**Course Objectives:**

Each successful student will demonstrate foundation knowledge and application of the following skills:

* Outline the basics components of a computer network using both the TCP/IP protocol suite and the OSI model.
* Identify the various types of network systems, including local area networks, metropolitan area networks, wide area networks, and voice/data delivery networks.
* Enumerate the various transmission media commonly used in carrier systems, i.e. twisted pair, coaxial cable, fiber optic cable, terrestrial microwave, satellite, as well as other wireless technologies.
* Recognize the basics of data communications, including data, signals, conversions between data and signals, encoding techniques, multiplexing, and modulation.
* Identify the various types of error detection and error corrections schemes.
* Identify the basics of T-carrier systems, frame relay, asynchronous transfer mode, DSL, and cable modems, and be able to compare and contrast their characteristics.
* Describe the basic operating procedures of the Internet and how it relates to data and voice communications.
* Enumerate the differences between the wireless telephone systems D‑AMPS, TDMA, CDMA, GSM, and others.
* Document the characteristics of local area networks, including hub and switch technologies.
* Complete a case study in which, given a minimum set of requirements, you will recommend wide area network solutions.

**Tentative Course Schedule:**

This schedule is at the end of syllabus.

**Required Text & Required Course Supplies:**

**Data Communications and Computer Networks**

**A Business User’s Approach**

 Hardcover: 528 pages

Publisher: Course Technology; 7 edition (January 21, 2012)

ISBN-10: 1133626467

ISBN-13: 978-1133626466

**Reference Text:**

Data Communications and Networking, 4th edition

Behrouz Forouzan, McGraw Hill

ISBN-13 978-0-07-296775-3

ISBN-10 0-07-296775-7

Network+ Guide to Networks, 6th edition

Tamara Dean, Course Technology

ISBN-13 978-1-133-60819-6

ISBN-10 1-133-60819-1

**Student Responsibilities:**

Class attendance and active participation are essential if students are to receive maximum benefit from the class. Participation requires preparation including completion of reading, labs, assignments, and exams by the due dates. If you cannot attend class or complete assignments, labs, or exams on time, please let the instructor know beforehand so that we can discuss alternative strategies. It is the student’s benefit to use their time wisely whether it is in preparation for class, during scheduled class, or in the lab. When students are in any IIT lab environment, they should abide by the college policies. Questions and comments are welcome.

**ADA Statement:**

Reasonable accommodations will be made for students with documented disabilities. In order to receive accommodations, students must obtain a letter of accommodation from the Center for Disability Resources. The Center for Disability Resources (CDR) is located in 3424 S. State St., room 1C3-2 (on the first floor), telephone 312 567.5744 or [disabilities@iit.edu](mailto:disabilities@iit.edu)

**ITM Student Resources:**

<http://www.itm.iit.edu/resources/studentresources.php>

**Blackboard – The IIT Online Classroom:**

We will use IIT's Blackboard system (<http://blackboard.iit.edu>) to communicate, submit homework, exams, terms papers, ask questions, and get feedback. Each student should have been notified of his or her Blackboard account for this course. If you have not been notified, go to above web page where there is contact information. Be familiar with how to use Blackboard.

**IIT Online/Internet Students:**

While online and distance-based courses offer a flexible way for students to obtain education and obtain professional development, they require a great deal of Individual Motivation. You will need to read each chapter of the textbook, the material posted online, and ask questions on anything you do not completely understand. It is highly recommended that you print this syllabus out and review it frequently to be sure you are keeping up with the course.

It is very easy to fall behind in a class. Please try to set aside regular blocks of time several times each week to read the course textbook and online material, ask questions, and submit assignments on a timely basis.

**Readings:**

Readings for the class will be assigned from the textbook as well as in the form of handouts or online reading. It is essential that you do all readings before coming to class on the assigned date. The readings and taking notes are necessary and integral part of the class and will form the basis for any class discussions on the topic. Specific readings are assigned by topic above. Online resources will be linked from Blackboard or will be posted on Blackboard.

**Course Notes:**

Copies of the course lecture notes in the form of a PDF of the PowerPoint presentation accompanying each lecture will be provided for each student on Blackboard. This should be useful if you must miss a class. You should be aware that note taking is encouraged and should help your understanding of the material.

**Assignments:**

Assignments will be made on a week-by-week basis. All assignments will be submitted via Blackboard in Microsoft Word or PDF format. An assignment will usually be due on or before the Wednesday following the date that it was assigned. Additional homework assignments will be given to Graduate Students.

**Exams:**

There will be two exams:

* Midterm
* Final.

Live in-class students will take the exams during the normal lecture time and dates shown in the Course Schedule.

Internet students can take the exams either by coming to class on the day of the exam or at a remote location on the day scheduled for the exam. (IIT will provide proctors for students taking the exam at a remote location.) Internet student must notify IIT ONLINE as to how they will take exams more than one week before the date of the exam.

**Term Paper:**

Students will be expected to write a term paper in relation to a topic of their choosing in the area of data communications and computer networks. This topic must be approved by the instructor. A topic must be selected by midterms, we will discuss further in class.

Undergraduates: APA Format, 10 pages, double space, 12 point font, 1in margins

Graduates: APA Format, 20 pages, double space, 12 point font, 1in margins

<http://www.itm.iit.edu/resources/paperguidelines.php>

**Extra Credit:**

The Instructor will provide students with an opportunity to earn extra credit. For the completion of any IT related Certifications during this class (not ones you already have obtained). The list is provided on Blackboard and you will be given points corresponding to missing a homework assignment for each one (up to two total). Note: This cannot be used to inflate your grade…it will only replace missing homework/lab points.

**Academic Honesty Policy:**

Any violations of IIT policies regarding academic honesty and or integrity will be referred automatically to the appropriate college authorities for disposition. Please see appropriate pages in the college catalog (graduate/undergrad) for definitions and regulations. Any academic dishonesty (cheating) will result in either (1) a zero (0) for the assignment, program, test, quiz or exam, or (2) a failing grade for the course, depending on the severity of the dishonesty. *Bottom-line: Do not do it.*

Examples of academic dishonesty include, but are not limited to, the following:

* Representing the work of others as your own.
* Obtaining or using unauthorized tests or quizzes.
* Use of unauthorized material, such as notes, books, during an examination.
  + Open cheating during an examination, such as looking at another student’s examination.
* Receiving or giving unauthorized assistance from/to other students.
* Revision of graded work in an effort to obtain additional credit.

**Withdraw Policy:**

Missing three or more assignments and or labs before the Mid-term will result in the student withdrawn from the class for non-pursuit of Course Objectives. No longer attending class does not constitute an automatic withdrawal.

**Incomplete Policy:**

Incomplete grades are generally not given without sound reason and documented evidence as described in the IIT Student Handbook. In all cases, for a student to receive an incomplete, he or she must be passing and must have a completed a significant portion of the course. If an incomplete grade is given, the student must make up all the work by the date agreed upon by them and the instructor.

**Classroom behavior:**

During the class time, considerate conduct by all persons is important to a favorable learning environment. Any infringement on the rights of others to get an education will be dealt with in an appropriate manner. Please set all electronic devices such as cell phones or pages to silent modes. Do not let you phone go off in the class.

Note: If you develop, some issue or outside issue develops please come and see me sooner than later. Usually some compromise or accommodation can be reached. Help me to help you solve any problem you may have.

**Course Outcomes:**

The course is a foundation course in the basics of Data Communications and Computer Networks. It is intent is to serve as a basis for practical studies in field of Computer Networking and Network Administration.

Upon completion, a student should be able to understand how a Computer Network works from both a practical and theoretical perspective. They should understand OSI & TCP/IP Models, Various Networking Protocols, Data Circuits, Switches, and Routers. They will also have an understanding of troubleshooting and management of networks by usage of various tools.

**Grading & Evaluation Criteria:**

|  |  |
| --- | --- |
| Homework/Labs | 20% |
| Term Paper | 20% |
| Midterm Exam | 30% |
| Final Exam | 30% |

NOTE: I will not allow any makeup of tests, quizzes, or homework unless prior notification is given. You must get approval via e-mailahead of time.

**Undergraduate Grading Scale:**

A – 90% and up

B – 80% to < 90

C – 70% to < 80

D – 60% to < 70

F – 59% below

Pass/Fail – >=70%

**Graduate Grading Scale:**

A – 90% and up

B – 80% to <90

C – 65% to <80

E – 64% below

**Tentative Course Schedule:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Week** | **Topics/Deliverables** | **Chapters** |
| 1/13/14 | 1 | Introduction to Computer Networks and Data Communications | 1 |
| 1/20/14 | 2 | Fundamentals of Data and Signals  **No Class MLK Day** | 2 |
| 1/27/14 | 3 | Conducted and Wireless Media | 3 |
| 2/03/14 | 4 | Making Connections | 4 |
| 2/10/14 | 5 | Making Connections Efficient: Multiplexing and Compression | 5 |
| 2/17/14 | 6 | Errors, Error Detection, and Error Control | 6 |
| 2/24/14 | 7 | Local Area Networks: Part I | 7 |
| 3/03/14 | 8 | Local Area Networks: Part II | 8 |
| 3/10/14 | 9 | **Midterm Exam**  **Term Paper Topics Due** |  |
| 3/17/14 | 10 | **\*\*\*SPRING BREAK\*\*\*** |  |
| 3/24/14 | 11 | Introduction to Metropolitan and Wide Area Networks  **No Class @ ICCWS 2014** | 9 |
| 3/31/14 | 12 | The Internet | 10 |
| 4/07/14 | 13 | The Internet (continued) | 10 |
| 4/14/14 | 14 | Voice and Data Delivery Networks | 11 |
| 4/21/14 | 15 | Network Security | 12 |
| 4/28/14 | 16 | Network Design and Management  **Term Papers Due** | 13 |
| 5/05/14 | Finals | **Final Exam (TBA)** |  |