R·I·T	**Rochester Institute of Technology** **Golisano College of Computing and Information Sciences** **Department of Information Technology**

4002-341

Data Communications and Computer Networks

<Fall 2005-2006> Course Syllabus

REMINDER: The information presented in this syllabus is subject to expansion, change, or modification during the quarter

Instructor:	Office Hours:
Name: Dr. Xiaojun Cao	Tuesday 3:00 pm to 5:00 pm
Office: Bldg. 70-2321	Thursday 3:00 pm to 5:00 pm
☎ 475 –4475	
✍ Email address cao@it.rit.edu	Other times by appointment

First Class Conference:
341-70-20051-Cao
or
https://firstclass.it.rit.edu/Login/F0000D054/
F0000D118/F0001C936/F000200AC/

Class meeting time and location
4002-341-70 Tuesday and Thursday 6:00 pm to 7:50 pm 70-2455

Course Text and Materials
1. **Forouzan,B Introduction to Data Communications and Networking 3nd ed. McGraw-Hill (ISBN:0-07-251584-8)**
2. **Handouts & Online Readings as assigned**

Important RIT Deadlines
Last day of add/drop is September 12, 2005.
Last day to withdraw with a grade of "W" is October 14, 2005. The deadline for withdrawing from a course with a W grade is the end of the 6th week of the quarter. Forms may be obtained from your department office and need your instructor's signature. The completed forms should be returned no later than October 14, 2005. *NOTE*: IT department policy states that a student has one quarter to **challenge** any **grade**. After that, grades cannot be challenged.

Course Description

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This course provides an introduction to basic concepts, theories and components in data communications. Topics include but are not limited to communication system models, components, topology, protocols, signal encoding, error detection and correction methods, transmission media and fundamentals of wireless communication. (Prerequisite 1016-205) Class 4, Credit 4.

Course Learning Outcomes
Understanding data communication is an essential element in solving problems in computing environments. This course will provide the theoretical concepts needed to establish a solid foundation for students to acquire more advanced data communication knowledge in other courses.

Intended learning outcomes and associated assessment methods of those outcomes:
1. Define data communications and telecommunications. Define and diagram five network topologies. Measured in a homework assignment.
2. List the layers in the Internet and OSI models and describe their functions. Assessed in a homework assignment and exam.
3. List several standards organizations and identify several data communication standards. Assessed in an exam.
4. Draw a simple Direct Current or Alternating Current circuit and use Ohm's law to solve for E, I or Z. Describe how electromagnetic fields affect data communication and how a motor and generator can be created. Assessed in a homework assignment.
5. Identify the characteristics of Digital and Analog signals and the relationship of frequency, period, bit interval, bit rate, bandwidth, and baud rate. Assessed in a homework assignment and exam.
6. Explain methods that are used to encode analog and digital signals. Assessed in a homework assignment and exam.
7. Identify situations in which various encoding schemes are used in data communications. Assessed in an exam.
8. Describe the components of a data communication interface and relate it to a specific interface standard. Assessed in a homework assignment and exam.
9. List the advantages and disadvantages of common data communication media. Assessed in a homework assignment and exam.
10. Identify several codes that are used for error detection and how error correction is accomplished. Assessed in a homework assignment and exam.
11. Describe a data link protocol and define how it controls the transfer of frames. Assessed in a homework assignment and exam.
12. Define multiplexing and switching. Identify how and why each is used in data communications. Assessed in an exam.
13. Research a current communication technology and explain in writing that technology, its current state, and impact. Assessed through a term paper.

Prerequisites: 1016-205 Discrete Math I

Role of course in curriculum for:

IT: This course will provide the theoretical concepts and terminology needed to establish a solid foundation for students to acquire more advanced data communication knowledge in other courses.

Applied Networking and System Administration: This course will provide the theoretical concepts and terminology needed to establish a solid foundation for students to acquire more advanced data communication knowledge in other courses.

Course required for graduation in:

BS/IT
This course is a core course in the BS in Information Technology.
BS/ANSA
This course is a core course in the BS in Applied Networking and Systems Administration.

Course Organization

<u>**Written Exams**</u>
Written examinations/quizzes are designed to test your understanding of terms, concepts, and the successful application of those terms and concepts. Short answer, multiple-choice, and fill in the blank questions test the first of these; short answer questions and problems test the second. Other questions are designed to test your ability to apply a specific skill, e.g., to create or label a diagram. All exams will be analyzed after they have been administered; the instructor will look for—and eliminate—invalid or poorly formed questions.

All examinations/quizzes are closed book and **calculators are *not*** allowed during any examination/quiz. You may prepare a *hand-written* one-sided 8 ½ by 11 inch "study guide" for each examination and quiz you take and bring it to your examination. These study guides must have your name in the upper left-hand corner. These sheets will be turned in and will be checked by your instructor. The quizzes will be given during regularly scheduled class time. The final exam will be on week 11 with no exceptions. You will be allowed a two-sided *hand-written* 8 ½ by 11 inch "study guide" for the final examination.

Make up exams will only be given as a result of extremely extenuating circumstances (requires verification). You must notify your faculty member in advance.

<u>**Term Paper**</u>
A paper related to the concepts of data communications will be assigned. The subject is your choice, but it must be related to data communication.

This gives you an opportunity to research a topic of interest to you and receive credit for doing so. Examples of past topics students have selected include Cable Modems, DSL, Cellular Telephone, Voice over IP, Gigabit Ethernet, Blue Tooth. Do not let this list restrict you. This will be an individual assignment. The paper must be submitted to **http://www.turnitin.com**, which will check for authentic contribution from you. Details on turnitin.com will be given in the class. You will be required to write an Abstract of this paper. The Abstract does not count toward the minimum paper length.

Homework
Homework assignments will be distributed and should be submitted in class on the specified due date. This is an individual assignment designed to test your mastery of topics covered up to that week. Preparing the solutions for the homework assignment will help you to partly get ready for the quiz and exam. **No handwritten assignments will be accepted.**

Exercises & Bonus Points
Five exercises will be given during the quarter. These exercises will help you in the quizzes and exams. You can accept help from your friends (but not copy the solutions from your friend) or the instructor. These exercises will be marked and **you will be given 1 bonus point for every exercise you submitted on time. Late submissions will not be accepted.**

Assignment Due Dates and Grading
The Homework and Term Paper assignments are due on the dates specified by the instructor. Failure to submit your assignment on time will result in a grade reduction according to the following schedule. The percentage grade reduction will be calculated using the highest possible grade for that assignment.

Amount Late	Reduction In Grade
One day late	10%
Two days late	20%
Three days late	30%
More than three days late	100% (a zero for the assignment)

Extremely extenuating circumstances may be accepted as a valid excuse for not handing an assignment in on time (requires verification). You must notify the faculty member **in advance,** i.e. before the due time of the assignment.

Class Participation
Attendance in lecture is not checked or documented. It is assumed, however, that you will attend the lectures. Your actions in the classroom should reflect the professional standard of behavior expected in the commercial environment: you should be respectful of your classmates, the professor, and the course support

personnel (the note-takers and interpreters) and you should willingly participate when asked to do so.

FirstClass

You are required to have a FirstClass account for course communications and for submission of those assignments that must be submitted in soft-copy form to a designated FirstClass drop box. FirstClass is the **ONLY** mail server from which your instructor will accept and respond to email exchanges with students. Any email sent to your instructor from any other email system will be discarded without prejudice. Although a FirstClass feature allows forwarding incoming messages to another mail service under the **edit/preferences** menu, you might find it much more advantageous to always use your FirstClass account for all your work. Please note that you can install a FirstClass client on your own PC that requires and Internet connection either via PPP, cable modem, or some other direct connection. If you find yourself in an environment where installation of the FirstClass client is unacceptable, a convenient alternative is the use of a browser and the address: **firstclass.it.rit.edu/login**

Any announcements on the deadlines and other material related to this course will be posted in the First Class Conference as identified below.

Section 70 (Professor Cao):   **341-70-20051-Cao**

Check your section First Class postings regularly.

You are expected to read the chapters in your text as identified below.

Course Schedule

Week	Topics/Exams	Assigned Reading	Activities
1	Intro, Protocols, Topology, OSI Model, & Standards	Chapters 1-2	Paper Assignment given
2	Basic Electricity and Magnetism	Handouts	
3	Signals	Chapter 3	HW 1 to be given
4	Digital & Analog Transmission	Chapter 4,5	HW 1 due & Quiz 1
5	Data Transmission Interfaces	Handouts	
6	Transmission Media	Chapter 7	HW 2 given,
7	Error Detection & Correction	Chapter 10	HW 2 due &Quiz 2
8	Data Link Control, Data Link Protocols	Chapter 11	Paper Assignment due
9	Multiplexing, Packet Switching & Circuit Switching	Chapter 6, 8	HW 3 given
10	/ Catch-up		HW 3 due &Quiz 3
11	**Final Exam**		

Grading

The grading scale used along with the grading criteria is as follows:

Component	Weight
3 Quizzes Each quiz 15 (points)	45
3 Homework Assignment (each HA -5points)	15
Paper Assignment	15
Final Exam	25

Range	Grade
>= 90.0%	A
>= 80.0% & < 90%	B
>= 70.0 % & < 80.0%	C
>= 60.0 % & < 70.0%	D
< 60.0%	F

Cheating Policy: Please review the departmental policy on cheating as described at http://www.it.rit.edu/policies/dishonesty.html or See attached copy.

Student Responsibilities: Please review the general student responsibilities as outlined at http://www.it.rit.edu/~netsyslab/Responsibilities.htm

Finally...

Any or all of the previous information is subject to change or modification during the quarter.

DEPARTMENT OF INFORMATION TECHNOLOGY ACADEMIC DISHONESTY POLICY[1]

The following statement is the Policy on Academic Dishonesty for the Department of Information Technology:

The Department of Information Technology does not condone any form of academic dishonesty. Any act of improperly representing another person's work as one's own (or allowing someone else to represent your work as their own) is construed as an act of academic dishonesty. These acts include, but are not limited to, plagiarism in any form or use of information and materials not authorized by the instructor during an examination or for any assignment.

If a faculty member judges a student to be guilty of any form of academic dishonesty, the student will receive a **failing grade for the course**. Academic dishonesty involving the abuse of RIT computing facilities may result in the pursuit of more severe action.

If the student believes the action by the instructor to be incorrect or the penalty too severe, the faculty member will arrange to meet jointly with the student and with the faculty member's immediate supervisor. If the matter cannot be resolved at this level, an appeal may be made to the Academic Conduct Committee of the college in which the course is offered.

If the faculty member or the faculty member's immediate supervisor feels that the alleged misconduct warrants more severe action than failure in the course, the case may be referred to the Academic Conduct Committee. The Academic Conduct Committee can recommend further action to the dean of the college including academic suspension or dismissal from the Institute.

The following definitions will be used to clarify and explain unacceptable conduct. This is not intended to be an exhaustive list of specific actions but a reasonable description to guide one's actions.

CHEATING includes knowingly using, buying, stealing, transporting or soliciting in whole or part the contents of an administered/unadministered test, test key, homework solution, paper, project, software project or computer program, or any other assignment. It also includes using, accessing, altering, or gaining entry to information held in a computer account or disk owned by another.

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[1] You are strongly encouraged to review the following web sites which give information on writing skills and examples of plagiarism:

> http://webster.commnet.edu/mla/plagiarism.htm
> http://www.hamilton.edu/academic/Resource/WC/AvoidingPlagiarism.html
> http://www.rhodes.edu/kamhi/center/plagiarism.html
> http://dir.yahoo.com/Social_Science/Communications/Writing/Plagiarism/

COLLUSION means the unauthorized collaboration with another person in preparing written work or computer work (including electronic media) offered for credit. Final work submitted by a student must be substantially the work of that student. Collaboration on an assignment is expressly forbidden unless it is explicitly designated as a group project. When there is any doubt, a student should consult the instructor (NOT ANOTHER STUDENT) as to whether some action is considered collusion.

Whenever there is any question as to whether a particular action is considered academic dishonesty, the instructor should be consulted.