BUSINESS DATA COMMUNICATION AND NETWORKS

Overview:
This course begins with a brief history of communications, information systems and the Internet in order to help the student understand the evolution of different network models and current standards. Application architectures, and their relevance to specific network-based applications, such as the Web, email, ftp, telnet and IM, are presented. The Physical Layer is presented in the form of basic data communications concepts over both wired and wireless transmission media. Data Link layer responsibilities including media access, error control, data link protocols and transmission efficiency are covered. The basic functions of the Network and Transport layers are explained in context of design issues, addressing, routing and internetworking. The TCP/IP suite of protocols are used for an in depth example. LANs are covered in detail including components, Ethernet, design and performance. Wireless networks including WI-FI, WIMAX, Bluetooth and best practices in WLAN design are then presented. In order to address the needs of an enterprise backbone networks are covered in depth including components, architectures, virtual LANs, technologies and best practices in design. Moving from the local area networking environment, metropolitan and wide area networking technologies are covered. The course then concludes with relevant concepts in network security, network design, and network management.

Prerequisite: BU - MET CS 201 or MET CS 231 or MET CS 232

Textbooks:

Various Technical Papers on related topics will be handed out throughout the semester. (Supplemental)

Instructor:
Scott D. Arena
Telephone: 781-466-3014
E-mail :: sdarena@bu.edu

Office Hours:
The instructor will be available for questions after each lecture, and traffic permitting also in advance of every lecture period. Additional time will be provided as requested. * The student is encouraged to notify the instructor if it is known prior to the associated time period.

Attendance:
Attendance is mandatory and all students are expected to attend each of the weekly lectures unless they have made prior arrangements with the instructor. Students are also expected to attend the weekly lectures in a timely fashion, and should make every effort to arrive on time and with minimal disruption to the class proceedings. Weekly Attendance will be taken for administrative purposes.
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Grading:
A student’s grade will be derived from five sources: Mid-Term and Class Participation, Quizzes, Homeworks, Project / Presentations. Students are expected to abide by the academic honesty standards established in the Metropolitan College’s Code of Academic Conduct, for ALL course work.

Homework:
Homework assignments will be given each week. When applicable, solutions to selected questions will be covered at the start of the each class. If a written assignment is given, it is due at the start of the next consecutive lecture unless a specific date is communicated by the instructor. Homework assignments may be emailed, handed in via paper copy or USB / Media Drive, etc. (MS-word, Adobe Acrobat, or ASCII text format). Any email copies must be received by 3:PM on the date for which it is due, and a confirmation-reply response is required for applicable credit. Homework assignments MUST be typed or done on computer for clarity. Homework will be marked down one letter grade for each day it is late, and will NOT be accepted after the third day.

Class Schedule*

The First Day of Class is Tuesday January 18th, 2011

The Last Day of Class is Tuesday May 10th, 2011

⇒ NOTE: There are No classes on the following date(s):
Tuesday February 22nd & Tuesday March 15th

BU-MET CS-625 meets in MCS-B31 on the following evenings :

January :: 18 – 25
February :: 1 - 8 – 15
March :: 1 – 8 – 15 - 29
April :: 5 – 12 – 19 – 26
May :: 3 - 10

*note: The format and content of all student projects will be determined by the March 3rd Class meeting.

**note: All Students will be required, without exception to present their projects to the class during the last scheduled class meetings. { dates to be determined based on student count }

***note: All MS-Office submitted work must be in Office .DOC and .PPT formats. Students should not submit .DOCX or .PPTX Office submissions due to incompatibility issues between the versions.
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Course Description:
Computer networks dominate today's information technologies and are essential for a business to compete in the global marketplace. This course is intended to provide you with knowledge and understanding of basic concepts of data communication in business environments as well as of computer networks and protocols. The material will be presented in the context of the Internet reference model, with particular focus on the physical, network, transport, and application layers. Frequently used protocols are presented, which illustrate concepts and provide insight into practical networks. Examples include widely used network protocols, such as the TCP/IP suite. Those who have completed the course will have the basic knowledge of computer networks and data communications.

Communication Skills:
Boston University Metropolitan College students, in addition to achieving mastery of subject matter and professional terminology, must be proficient in written and spoken English in order to achieve success in their academic studies and professional careers. Please be advised that papers and oral presentations that do not meet the high normative standards of university education will be downgraded or returned for revision.

Help is available at every stage of the writing process and with oral communication and presentations. Please ask your instructor, academic advisor or check the MET website http://www.bu.edu/met/students. Also, please also see the Student Code of Conduct www.bu.edu/met/students/conduct_code.html

Conduct:
Cheating and plagiarism will not be tolerated in this class. They will result in no credit for the homework, examination or the course as well as possible suspension from Boston University.

The instructor can and will use university resources to verify authenticity of student submissions.

This should not be understood as a discouragement for discussing the material or your particular approach to a problem with other students in the class. If you choose to work in a group, I will be expecting more than one and highly original solutions rather than the same mistakes. If you use external sources, make sure that you reference them in the bibliography. In case of Internet sources include the full address of the Internet site where the material came from in your references.
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Course Format:
The course format will be a combination of lectures and student / team presentations and case studies.

Grade Determination:
• Quiz / Exams: 20%: In-Class exams and / or case studies will take place throughout the semester and will consist of objective questions designed to test your ability to understand the technology and the industry.

• Mid-Term Exam: 20%: A Mid-Term exam scheduled for week-7 / March 8th, will be assigned to each student. All questions will be derived from the Weekly Lecture presentations and from the assigned readings in the required text or instructor handouts.

• Homework Assignments: 20%: Homework assignments will be given on a regular basis. These will consist of readings and select questions to be turned in by the start of the next consecutive lecture. If a student cannot attend a lecture it is his / her responsibility to get their completed assignment to the instructor when it is due.

• Final Individual (or) Team Project: 35% (25% written, 10% oral presentation). For this project, you will compose a technical paper and presentation on a related course topic which has been approved by the instructor. Up to three students may elect to work together on their project and presentation. A 25 minute presentation to the class is required for each presentation participant. (i.e. if you elect to work as a team the total time = 25 minutes for each team member)

• Discussion / Question / class participation: 5%: Your contributions to class discussions, current Data related items in the news {Snippets} and case analysis will be graded in terms of your ability to ask good questions and provide your own critical insights. Class attendance and promptness is mandatory for a high participation grade.

**note: The instructor reserves the right to vary the percentages of the aforementioned areas, based on the progress of the semester. This will only be done to areas that have not been completed at the time of the change. (i.e. once the mid-term has been administered, it’s point value will not change, etc.)
CS/TC 625 Final Project:

Students will develop a case study on one of the relevant Data Networking topics. The students can propose a topic or one will be given to them by the instructor. The emphasis will be on how the given technology is used in real Business networks or the Internet. Students will give an in-class presentation. Up to three students can work on a given project, and each will be responsible for a clearly defined part of it. Students can elect to do a Network design project in place of a traditional project / presentation.

Business Data networks are all around you and a part of your everyday life, you are strongly encouraged to select a project based on a real-world example of a business network that you can access and gain an understanding and appreciation of it’s architecture and operation.

For Example :: Many companies have implemented their own network infrastructure and enough insight can be obtained to formulate your project from business xyz’s architecture without exposing any proprietary information or non-public accessible data.

Regardless of what your topic is, rule number one is to always chose something that you are interested in, do not just select from the default list because you think that is all there is to pick from!

Each project should contain at least the following six sections: Introduction, Technology Background, Network Topology, Network Architecture (Layers and Protocols), Performance Issues, Conclusion.

Student may hand in the project as a PowerPoint, Word or PostScript document. A softcopy of the project/presentation must also be e-mailed / handed in to the instructor. Students should bring on the presentation day a copy of the Project presentation on a CD, DVD, USB or media drive as well as a hard copy of the project.

The Following “examples” are valid project topics: You are NOT required to select from this list!

1. Wireless LANs
2. Future Telephone Networks
3. Synchronous Optical Networks (SONET)
4. Wavelent Division Multiplexing (WDM) optical networks
   a. Dense (DWDM)
   b. Course (CWDW)
5. Ethernet Networks 10/100/1000
6. Storage Area Networks (SANs)
7. VOIP Networks
8. DSL networks
9. Cable modem Access Networks
10. Virtual LAN Topologies (VLANs)
11. Next Generation cellular networks
12. Future Network Technologies
13. Satellite Networks
Academic Conduct Policy

For the full text of the academic conduct code, please go to http://www.bu.edu/met/metropolitan_college_people/student/resources/conduct/code.html

A Definition of Plagiarism

"The academic counterpart of the bank embezzler and of the manufacturer who mislabels products is the plagiarist: the student or scholar who leads readers to believe that what they are reading is the original work of the writer when it is not. If it could be assumed that the distinction between plagiarism and honest use of sources is perfectly clear in everyone's mind, there would be no need for the explanation that follows; merely the warning with which this definition concludes would be enough. But it is apparent that sometimes people of goodwill draw the suspicion of guilt upon themselves (and, indeed, are guilty) simply because they are not aware of the illegitimacy of certain kinds of "borrowing" and of the procedures for correct identification of materials other than those gained through independent research and reflection."

"The spectrum is a wide one. At one end there is a word-for-word copying of another's writing without enclosing the copied passage in quotation marks and identifying it in a footnote, both of which are necessary. (This includes, of course, the copying of all or any part of another student's paper.) It hardly seems possible that anyone of college age or more could do that without clear intent to deceive. At the other end there is the almost casual slipping in of a particularly apt term which one has come across in reading and which so aptly expresses one's opinion that one is tempted to make it personal property.

Between these poles there are degrees and degrees, but they may be roughly placed in two groups. Close to outright and blatant deceit—but more the result, perhaps, of laziness than of bad intent—is the patching together of random jottings made in the course of reading, generally without careful identification of their source, and then woven into the text, so that the result is a mosaic of other people's ideas and words, the writer's sole contribution being the cement to hold the pieces together. Indicative of more effort and, for that reason, somewhat closer to honest, though still dishonest, is the paraphrase, and abbreviated (and often skillfully prepared) restatement of someone else's analysis or conclusion, without acknowledgment that another person's text has been the basis for the recapitulation."

{The paragraphs above are from H. Martin and R. Ohmann, The Logic and Rhetoric of Exposition, Revised Edition. Copyright 1963, Holt, Rinehart and Winston.}

Academic Conduct Code

I. Philosophy of Discipline

The objective of Metropolitan College in enforcing academic rules is to promote the kind of community atmosphere in which learning can best take place. This atmosphere can be maintained only so long as every student believes that his or her academic competence is being judged fairly and that he or she will not be put at a disadvantage because of the dishonesty of someone else. Penalties imposed should be carefully determined so as to be no more or no less than required to maintain the desired atmosphere. In defining violation of this code the intent is to protect the integrity of the educational process.

II. Academic Misconduct

Academic misconduct is conduct by which a student misrepresents his or her academic accomplishments or impedes other students' chances of being judged fairly for their academic work. Knowingly allowing others to represent your work as theirs is as serious an offense as submitting another's work as your own.
III. Violations of this Code

Violations of this code are acts that constitute an attempt to be dishonest or deceptive in the performance of academic work in or out of the classroom. To alter academic records, or to collaborate with another student or students in an act of academic misconduct. Violations include but are not limited to:

A. Cheating on examinations. Any attempt by a student to alter his or her performance on an examination in violation of that examination's stated or commonly understood ground rules.

B. Plagiarism. Any attempt by a student to represent the work of another as his or her own. Plagiarism includes each of the following: copying the answers of another student on an examination, copying or substantially restating the work of another person or persons in any oral or written work without citing the appropriate source, and collaboration with someone else in an academic endeavor without acknowledging his or her contribution (see below for a more detailed definition of plagiarism).

C. Misrepresentation or falsification of data presented for surveys, experiments, etc.

D. Theft of an examination. Stealing or otherwise discovering and/or making known to others the contents of an examination that has not yet been administered.

E. Unauthorized conversation is not allowed during examinations. Any unauthorized conversation may be considered prima facie evidence of cheating.

F. Knowingly allowing another student to represent your work as his or her own.

G. Forgery, alteration, or knowing misuse of graded examinations, grade lists, or official University records or documents, including but not limited to transcripts, letters of recommendation, degree certificates, alteration of examinations or other work after submission.

H. Theft or destruction of examinations or papers after submission including purposefully altering possible poor performance.

I. Submitting the same work in more than one course without the consent of the instructors involved.

J. Altering or destroying another student's work or records, altering records of any kind, removing materials from libraries or offices without consent, or in any way interfering with the work of others so as to impede their academic performance.

K. Failure to comply with the sanctions imposed under the authority of this code.