

Syllabus

Course Title: Broadband & Wireless Networks

Course Number: CN 321

Course Description:

Presents Wide Area Network (WAN) interconnection technologies, including Internet Service Provider (ISP) and wireless carrier services. Covers telecommunications link engineering considerations and methodologies. Investigates wireless communications technology and infrastructure in wireless LAN and cellular architectures.

Prerequisite Courses:

CN 316 Network Infrastructure

Course Overview

The purpose of this course is to provide the student with a foundation in wide area network (WAN) technologies, including Internet Service Provider and wireless carrier services. This course will introduce the student to the concepts and protocols used for client/server and peer/peer connectivity over long distances. The architecture of private enterprise networks as well as the wired and wireless transport networks that are offered as a service will be covered.

Key concepts to be covered in this course include:

- Data transmission and transmission Media
- Signal encoding and error control
- Data link control and multiplexing
- Wide area networks
- Network quality of service (QoS) mechanisms
- Wireless LANs and cellular networks

Course Outcomes:

Upon completion of this course, learners should be able to:

- Investigate the most appropriate WAN technology and architecture to solve a given connectivity requirement.
- Explain the physical characteristics and limits of WAN technologies.
- Compare the features and functionality of different copper transmission systems.

- Compare the features and functionality of different fiber optic services (SONET, MetroE, WDM).
- Compare the characteristics of different wireless technologies used for data and voice communications.
- Analyze communication links for capacity, encoding techniques, error management, delay, and jitter to determine the impacts on Quality of Service (QoS).

Course Materials:

Required Texts:

Stallings, W. (2014). *Data and Computer Communications* (10th ed.). Pearson Education: New York. ISBN-10: 0133506487, ISBN-13: 9780133506488.

American Psychological Association. (2010). *Publication Manual of the American Psychological Association* (6th ed.). Washington, DC: American Psychological Association. ISBN 1433805618, 978-1433805615. Companion website: <http://www.apastyle.org>.

Required Resources:

Online access to textbook premium content at www.pearsonhighered.com/stallings (requires registration with student access code provided inside front cover in new textbook)

inSSIDer tool (free) – Download instructions included in Week 7 Wireless Lab.

Technology Tools:

Minimum Technology Requirements: <http://www.regis.edu/CPS/CPS-Student-Portal/College-for-Professional-Studies/Academic-Resources/Online-Learning/System-Requirements.aspx>

Optional Materials:

Kurose, J. F., & Ross, K. W. (2013). *Computer Networking: A Top-Down Approach* (6th ed.), Section 6.7: Managing Mobility in Cellular Networks.

Regis Library: <http://www.regis.edu/library.htm>.

Pre-Assignment:

Online Format: Reading of Stallings, W. (2014) text, Chapters 1 & 2 as an overview and review of data communications concepts and protocols.

Sign on to WorldClass (<http://worldclass.regis.edu>) and become familiar with the course navigation of the Web Curriculum.

Classroom-based Format: Reading of Stallings, W. (2014) text, Chapters 1 & 2 as an overview and review of data communications concepts and protocols.

Sign on to WorldClass (<http://worldclass.regis.edu>) and become familiar with the course navigation of the Web Curriculum.

Pre-Assignment Due Dates:

Classroom-based Format: This assignment is due the first night of class.

Online Format: The instructor will specify the due date for this assignment.

Course Assignments and Activities:

	Topics	Readings	Activities Assignments and Associated Points
1	Data Transmission <ul style="list-style-type: none"> • Review of Networking Concepts & Terminology • Analog & Digital • Transmission Impairments • Channel Capacity 	Stallings, W. (2014). Chapter 3 AND related Presentation (in Course Resources folder) From the Experts	Introductions – initial response required by Wednesday of Week 1 Discussion Questions (3.125%) Chapter Review Questions & Problems (3.125%)
2	Transmission Media <ul style="list-style-type: none"> • Copper • Optical fiber • Wireless 	Stallings, W. (2014). Chapter 4 AND related Presentation (in Course Resources folder) From the Experts	Discussion Questions (3.125%) Chapter Review Questions & Problems (3.125%) Written Research Assignment 1 & Discussion (due Week 3) (10%)
3	Signal Encoding <ul style="list-style-type: none"> • AMI, B8ZS, NRZ Error Control <ul style="list-style-type: none"> • Forward Error Correction 	Stallings, W. (2014). Chapters 5-6 AND related Presentation (in Course Resources folder) From the Experts	Discussion Questions (3.125%) Chapter Review Questions & Problems (3.125%)
4	Data Link Control <ul style="list-style-type: none"> • HDLC • Frequency & Time Division Multiplexing 	Stallings, W. (2014). Chapters 7-8 AND related Presentation (in Course Resources folder) From the Experts	Discussion Questions (3.125%) Chapter Review Questions & Problems (3.125%) Written Research Assignment 2 & Discussion (due Week 5) (10%)
5	Wide Area Networks <ul style="list-style-type: none"> • Multi-Protocol Label Switching (MPLS) 	Stallings, W. (2014). Chapters 9 & 23 AND related Presentation (in Course Resources folder) From the Experts	Discussion Questions (3.125%) Chapter Review Questions & Problems (3.125%)
6	Network Quality of Service (QoS) Mechanisms	Stallings, W. (2014). Chapter 22 AND related Presentation (in Course Resources folder) From the Experts	Discussion Questions (3.125%) Chapter Review Questions & Problems (3.125%) Written Research Assignment 3 & Discussion (due Week 7) (10%)

7	Wireless LANs	Stallings, W. (2014). Chapters 13 & 17 AND related Presentation (in Course Resources folder) From the Experts	Discussion Questions (3.125%) Chapter Review Questions & Problems (3.125%) Wireless LAN Lab Report (5%)
8	Cellular Networks	Stallings, W. (2014). Chapter 10 AND related Presentation (in Course Resources folder) From the Experts	Discussion Questions (3.125%) Chapter Review Questions & Problems (3.125%) Written Research Assignment 4 & Discussion (5%) Final Exam (10%)
			Maximum Points Possible: 100%

CC&IS Grading Scale

Letter Grade	Percentage	Grade Point
A	93 to 100	4.00
A–	90 to less than 93	3.67
B+	87 to less than 90	3.33
B	83 to less than 87	3.00
B–	80 to less than 83	2.67
C+	77 to less than 80	2.33
C	73 to less than 77	2.00
C–	70 to less than 73	1.67
D+	67 to less than 70	1.33
D	63 to less than 67	1.00
D-	60 to less than 63	.67
F	Less than 60	0

Additional information about grading can be found in the latest edition of the University Catalog, available at <http://www.regis.edu/Academics/Course%20Catalog.aspx>.

CC&IS Policies and Procedures

Each of the following CC&IS Policies & Procedures is incorporated here by reference. Students are expected to review this information each term, and agree to the policies and procedures as identified here and specified in the latest edition of the University Catalog, available at <http://www.regis.edu/Academics/Course%20Catalog.aspx> or at the link provided.

- The CC&IS Academic Integrity Policy.
- The Student Honor Code and Student Standards of Conduct.
- Incomplete Grade Policy, Pass / No Pass Grades, Grade Reports.

- The Information Privacy policy and FERPA. For more information regarding FERPA, visit the [U.S. Department of Education](#).
- The HIPAA policies for protected health information. The complete Regis University HIPAA Privacy & Security policy can be found here: <http://www.regis.edu/About-Regis-University/University-Offices-and-Services/Auxiliary-Business/HIPAA.aspx>.
- The Human Subjects Institutional Review Board (IRB) procedures. More information about the IRB and its processes can be found here: <http://regis.edu/Academics/Academic-Grants/Proposals/Regis-Information/IRB.aspx>.

The CC&IS Policies & Procedures Syllabus Addendum summarizes additional important policies including, Diversity, Equal Access, Disability Services, and Attendance & Participation that apply to every course offered by the College of Computer & Information Sciences at Regis University. A copy of the CC&IS Policies & Procedures Syllabus Addendum can be found here: <https://in2.regis.edu/sites/ccis/policies/Repository/CCIS%20Syllabus%20Addendum.docx>.