ITT Technical Institute

MC1260

Introduction to Mobile Communications Technology

Onsite Course

SYLLABUS

Credit hours: 4.5

Contact/Instructional hours: 56 (34 Theory Hours, 22 Lab Hours)

Prerequisite(s) and/or Corequisite(s):

Prerequisites: NT1110 Computer Structure and Logic or equivalent

Course Description:

This is an introductory course on mobile communications technology. Topics include, but are not limited to, mobile telephony, devices, systems, technologies, alternative mobile voice and data networks, applications, market and services, standards and regulations, the evolution and the future of mobile communications technology.

Where Does This Course Belong?

This course is required for the Mobile Communications Technology program in the School of Information Technology. This program covers the following core areas:

- Basic electronics and electronic communications
- Networking
- Programming
- Mobile communications technology
- General education

The following diagram demonstrates how this course fits in the program:
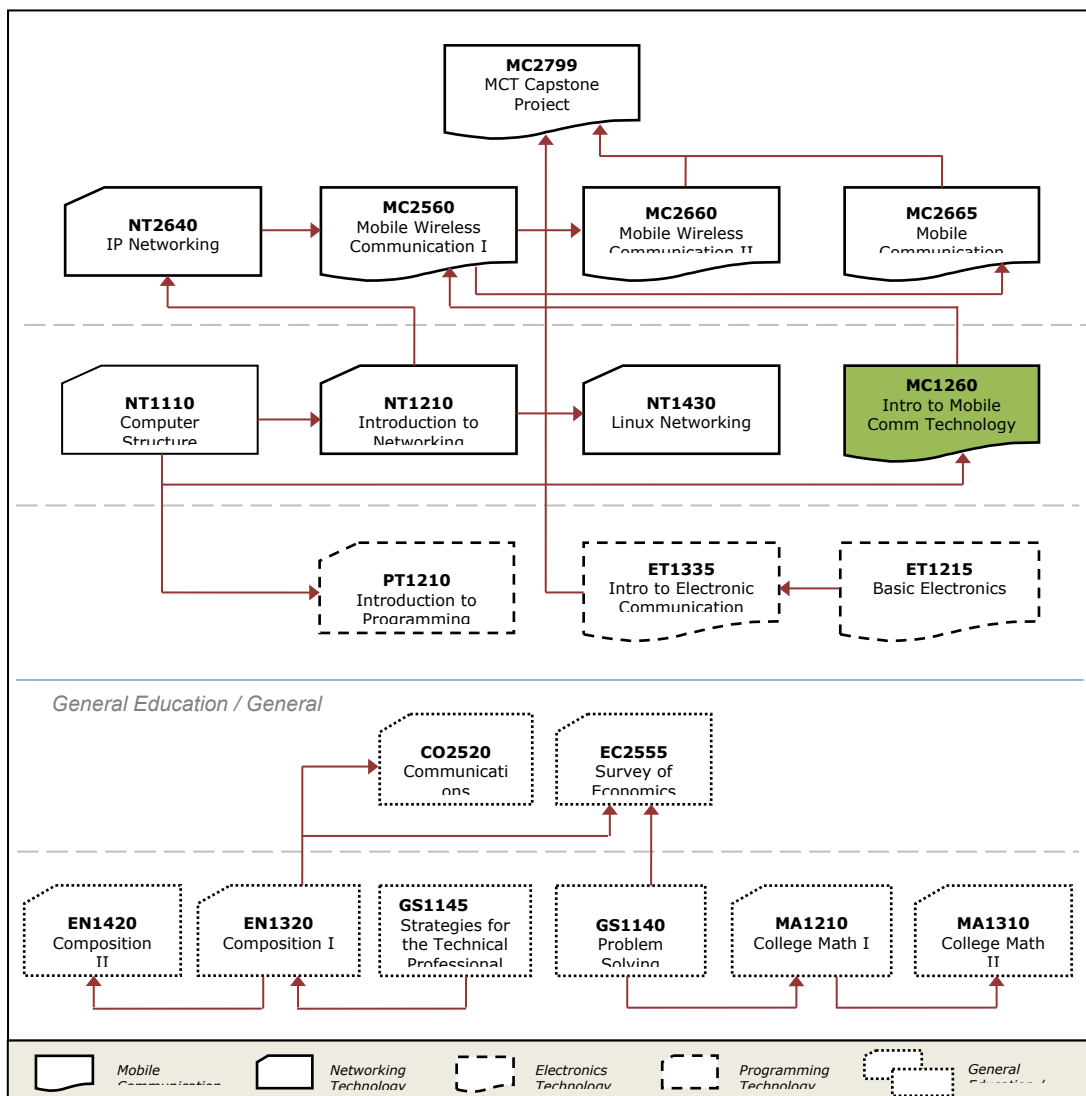
Course Summary

Major Instructional Areas

1. Mobile telephony

2. Devices, systems, and technologies of mobile communications

3. Alternative mobile voice and data networks

4. Applications, market and services

5. Standards and regulations

6. The evolution and the future of mobile communications technology

Course Objectives

Upon completion of the course, students should be able to:

1. Discuss the history and evolution of mobile communications technology.

2. Identify the main elements of a mobile communications system.

3. Explain mobile telephony, devices, and systems.

4. Differentiate between the major operating systems for mobile communications.

5. Analyze how spectrum availability, rules, regulations, and regulatory authorities are affecting the deployment, upgrade, and evolution of various types and generations of mobile and cellular networks.

6. Compare various types and generations of mobile and cellular networks in terms of how they connect, route, manage, and authenticate voice and data communications.

SCANS Objectives

SCANS is an acronym for Secretary's Commission on Achieving Necessary Skills. The committee, appointed by the National Secretary of Labor in 1990, created a list of skills and competencies that continue to be a valuable resource for individuals developing their careers in a high-tech job market. For more information on the SCANS objectives, visit The U.S. Department of Labor Employment and Training Administration: www.doleta.gov.

Learning Materials and References

Required Resources

Textbook Package	New to this Course	Carried over from Previous Course(s)	Required for Subsequent Course(s)
Rogers, G. S., & Edwards, J. (2011). Introduction to Wireless Technology. Custom ed. Prentice Hall PTR, Upper Saddle River, NJ.	■		■

Recommended Resources

Books, Professional Journals

- IEEE Communications Magazine

  http://ieeexplore.ieee.org/xpl/RecentIssue.jsp?reload=true&punumber=35

- RCR Wireless News

  http://www.rcrwireless.com/

Professional Associations

- The Institute of Electrical and Electronics Engineers

  www.ieee.org

- CTIA—The Wireless Association

  www.ctia.org

ITT Tech Virtual Library (accessed via Student Portal)

- Ahson, S.A., and Ilyas, M. (eds). *Get Certified: A Guide to Wireless Communication Engineering Technologies.* 2010.

- Gustrau, F., and Manteurffel, D. *EM Modeling of Antennas and RF Components for Wireless Communication Systems.* Signals and Communication Technology, 2006.

Other References

- www.ieee.org
- www.ansi.org
- www.bluetooth.com
- www.fcc.gov
- www.protocols.com
- www.wirelesslan.com
- www.nortelnetworks.com
- www.cisco.com

- www.3com.com
- www.directv.com

Information Search

Use the following keywords to search for additional online resources that may be used for supporting your work on the course assignments:

- Cellular
- GPS
- Bluetooth
- Spectrum allocation
- Personal area networks
- Wireless
- Public radio
- Personal communications
- Mobile radio
- Wireless device synchronization
- Home networks

NOTE: All links are subject to change without prior notice.

Course Plan

Instructional Methods

This course is designed to promote learner-centered activities and support the development of cognitive strategies and competencies necessary for effective task performance and critical problem solving. The course utilizes individual and group learning activities, performance-driven assignments, problem-based cases, projects, and discussions. These methods focus on building engaging learning experiences conducive to development of critical knowledge and skills that can be effectively applied in professional contexts.

Suggested Learning Approach

In this course, you will be studying individually and within a group of your peers. As you work on the course deliverables, you are encouraged to share ideas with your peers and instructor, work collaboratively on projects and team assignments, raise critical questions, and provide constructive feedback.

Use the following advice to receive maximum learning benefits from your participation in this course:

DO	DON'T
- Do take a proactive learning approach. - Do share your thoughts on critical issues and potential problem solutions. - Do plan your course work in advance. - Do explore a variety of learning resources in addition to the textbook. - Do offer relevant examples from your experience. - Do make an effort to understand different points of view. - Do connect concepts explored in this course to real-life professional situations and your own experiences.	- Don't assume there is only one correct answer to a question. - Don't be afraid to share your perspective on the issues analyzed in the course. - Don't be negative about the points of view that are different from yours. - Don't underestimate the impact of collaboration on your learning. - Don't limit your course experience to reading the textbook. - Don't postpone your work on the course deliverables – work on small assignment components every day.

Course Outline

Unit	Title	Reading Assignments	Graded Activities & Deliverables
1	Introduction to Wireless: Wireless and Mobile Telephony Evolution	Rogers, Chapter 1	▪ Lab ▪ Assignment ▪ Project Part 1
2	Applications, Market, and Services	Rogers, Chapter 2	▪ Lab ▪ Assignment ▪ Assignment
3	Regulation of Wireless Communications	Rogers Chapter 3	▪ Lab ▪ Project Part 2 ▪ Assignment ▪ Quiz 1
4	Wireless Systems & Technologies Part 1—Land Mobile Systems	Rogers Chapter 4, Sections 4.3.1 - 4.3.4	▪ Lab ▪ Assignment ▪ Project Part 3
5	Wireless Systems & Technologies Part 2—Cellular Technologies	Rogers Chapter 5	▪ Lab ▪ Assignment ▪ Project Part 4 ▪ Quiz 2
6	Wireless Systems & Technologies Part 3—WLANs	Rogers Chapter 4, Sections 4.2.1 - 4.2.3 Chapter 5, Section 5.2.1	▪ Lab ▪ Assignment ▪ Project Part 5
7	Wireless Systems & Technologies Part 4—Satellite Mobile Technologies (GPS, Satellite Radio, Satellite Phones)	Rogers Chapter 4.4	▪ Lab ▪ Assignment ▪ Project Part 6 ▪ Quiz 3
8	RFID Systems and Applications	Rogers Chapter 4, Section 4.5	▪ Lab ▪ Assignment
9	Smartphones and Operating Systems	Rogers Chapter 4, Section 4.7	▪ Lab ▪ Assignment ▪ Quiz 4 ▪ Course Project Paper
10	Wireless Systems of the Future	Rogers Chapter 6	▪ Lab ▪ Assignment ▪ Course Project PowerPoint Submission
11	Final Project Presentations	Rogers—Review All Chapters	▪ Course Project Final Presentation

Evaluation and Grading

Evaluation Criteria

The graded assignments will be evaluated using the following weighted categories:

Category	Weight
Assignments	25%
Labs	30%
Course Project	25%
Quizzes	20%
TOTAL	100%

Grade Conversion

The final grades will be calculated from the percentages earned in the course, as follows:

Grade	Percentage	Credit
A	90–100%	4.0
B+	85–89%	3.5
B	80–84%	3.0
C+	75–79%	2.5
C	70–74%	2.0
D+	65–69%	1.5
D	60–64%	1.0
F	<60%	0.0

Graded Activities and Deliverables

Unit #	Unit Title	Grading Category	Activity/Deliverable Title	Grade Allocation (% of all graded work)
1	Introduction to Wireless: Wireless and Mobile Telephony Evolution	Lab	Wireless All Around You: Observing Wireless Frequency Bands and Modulation	3%
		Assignment	Paper: Car Phones Prior to the Age of Cellular	2%
		Course Project	Project Part 1: Company and Historical Context	2%
2	Applications, Market, and Services	Lab	Bluetooth Pairing and Range Testing	3%
		Assignment	A Smart Move?	2%
		Assignment	Smartphone Feature Research	2%
3	Regulation of Wireless Communications	Lab	Wireless Application Retrieval & Device Synchronization Lab	3%
		Course Project	Project Part 2: Candidate Ideas	3%
		Assignment	Paper: The Role of the FCC in Mobile Communications	2%
		Quiz	Quiz 1	5%
4	Wireless Systems & Technologies Part 1—Land Mobile Systems	Lab	Push-to-Talk Application Lab	3%
		Course Project	Project Part 3: Course Project Outline	2%
		Assignment	Paper: Business Radio Before and After Nextel	2%
5	Wireless Systems & Technologies Part 2—Cellular Technologies	Lab	Wireless Network Setup and Configuration	3%
		Assignment	End of Chapter Review Questions	2%
		Course Project	Project Part. 4: Organizational Needs Analysis	3%
		Quiz	Quiz 2	5%
6	Wireless Systems & Technologies Part 3—WLANs	Lab	Data Sharing on a Wireless Network; Using Mobile Devices on a Local Wireless Network	3%
		Assignment	WLAN Solutions	2%
		Course Project	Project Part 5: Comparison and Contrast of Considered Mobile Technologies	3%
7	Wireless Systems & Technologies Part 4—Satellite Mobile Technologies	Lab	GPS Lab	3%
		Assignment	End-of-Chapter Review Questions	2%
		Course Project	Project Part 6: Draft of Body Sections of Paper	4%
		Quiz	Quiz 3	5%

Unit #	Unit Title	Grading Category	Activity/Deliverable Title	Grade Allocation (% of all graded work)
	(GPS, Satellite Radio, Satellite Phones)			
8	RFID Systems and Applications	Lab	RFID Development Kit Lab	3%
		Assignment	RFID Options: RFID Categories and Manufacturers Spreadsheet	2%
9	Smartphones and Operating Systems	Lab	Home Automation Lab With Wireless Device Control	3%
		Course Project	Project Part 7: Submission of Course Project Final Report	2%
		Assignment	Paper: Android or Apple?	3%
		Quiz	Quiz 4	5%
10	Wireless Systems of the Future	Lab	Home Security Lab with Wireless Device Control	3%
		Assignment	Paper: The Rise of M-Commerce	4%
		Course Project	Project Part 8: Final Project PowerPoint Submission	3%
11	Final Project Presentations	Course Project	Project Final Presentation	3%

Academic Integrity

All students must comply with the policies that regulate all forms of academic dishonesty, or academic misconduct, including plagiarism, self-plagiarism, fabrication, deception, cheating, and sabotage. For more information on the academic honesty policies, refer to the Student Handbook and the Course Catalog.

(End of Syllabus)