

COURSE DESCRIPTION

Department and Course Number: COMP 6390

Course Title: 3G and 4G Wireless Systems

Total Credits: 3

Required: No

Prerequisites: None

Corequisites: COMP 5360 or ELEC 5110

Class meetings per week: 3 hours

Lab meetings per week: 0 hours

Course Coordinator: Dr. Saad Biaz

Date Prepared: February 14, 2004

Current Catalog Description:

Exploration of technology types, design issues for handset and network systems, economics. Exploration of standards such as CT2, CT3, IS91A. Future challenges for 4G.

Textbooks:

Savo G. Glisic . 2004. *Advanced Wireless Communications : 4G Technologies*. John Wiley & Sons. ISBN 0470867760.

References:

Lillian Golenewski, *Telecommunications Essentials*, Addison-Wesley, 2001

Course Objectives:

1. Be able to understand technical issues related to 3G/4G wireless systems.
2. Be able to understand business, and regulatory issues related to 3G/4G wireless systems.
3. Be able to develop and implement software components on these systems.
4. Be able to apply concepts and techniques from telecommunications systems.

Prerequisites by Topic:

1. Fundamentals of computers networks
2. Fundamentals of communication systems

Topics Covered: (specify number of hours on each)

1. Overview (1 hour)
2. Review of 1G, 2G (AMPS, TDMA, GSM, CDMA) systems (3 hours).
3. Principles of Code Division Multiple Access (CDMA) (3 hours)
4. Wideband CDMA physical layer (5 hours)
5. Modulation techniques and spread spectrum (3 hours)
6. Spreading codes (2 hours)
7. Channel coding (2 hours)
8. Wideband CDMA protocol stack (3 hours)
9. Network (2 hours)
10. Network planning (4 hours)

11. Network management (3 hours)
12. 3G services (3 hours)
13. 3G applications (3 hours)
14. The future: 4G (4 hours)
15. Case study project presentations (4 hours)

Laboratory Projects: (specify number of weeks on each)

Develop an IP location management system (12 weeks)

Oral and Written Communications:

All students are required to develop and apply program documentation skills as part of the course project.

Social and Ethical Issues:

None.

Theoretical Content:

Fundamental concepts of signal processing and communication chain are presented in focused lessons and then applied as appropriate throughout the course.

Problem Analysis and Solution Design:

All students design and implement a final project related to IP location management. The student is responsible for specifying the problem his/her project solves, identifying constraints and design trade-offs, justifying design decisions, and discussing lessons learned.