Module Type		Taught	
Level		6	Credit Value: 10
Programme(s) in which module is available		BEng: Electrical and Electronic Engineering; Communication Engineering; Electronic Engineering & Computer Science BEng Electronic Engineering with Management Studies (last cohort)	
Involvement of Other Schools		None	
Resource Split		N/A	
Name of Module Co-ordinator		Dr Xiaohong Peng	
Related Modules	Pre-requisites	EE2CSE or EE2CPS or equivalent	
	Co-requisites	None	
	Prohibited Combinations	None	
Minimum and Maximum Intake Sizes		None	

Aims of the Module

To develop a basic understanding of radio wave propagation and the techniques used in modern radio communications systems engineering, with emphasis on mobile and satellite communications.

Summary of Content

1. Overview: Briefly introduce the topics that highlight the significance of radio communications and networks and their roles in supplying the needs of modern telecommunications.
2. Antennas and Propagation: Examine the principles and types of antennas and propagation models, including antenna gain, path loss, propagation mechanisms, line-of-sight transmission, noise and fading.
3. Mobile Communications Technologies: Explore fundamental telecommunications technologies used for mobile environments, covering modulation, equalization, channel coding, diversity techniques and spread spectrum.
4. Communication Networks: Develop an insight into a communication network that supports data transmission for multi-users. Define the protocol architecture that explains how vertical and horizontal communications between protocol layers take place in a network. Study some protocol standards such as OSI and TCP/IP and principles of wireless networking.
5. Radio Communications Systems: Introduce practical radio communications systems such as satellite and mobile communications systems.

Summary of Methods and Frequency of Teaching

Lectures/Tutorial: 22 hour
Laboratory classes: 9 hours
Private study: 69 hours

Summary of Methods of Assessment and Feedback (including formative feedback)

Examination (60%) 2 hr examination
Laboratory Assessment (40%) Assessment based on experiments in networking configuration, throughput measurement, and signal quality measurement.
Feedback will be provided according to School guidelines. 1-to-1 feedback will be provided orally during laboratory session and by written comments on written reports. Generic feedback will be provided orally in class and via Blackboard.

Module Outcomes – what the student should gain from successful completion of the module:	Learning and Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated	
	Learning and Teaching Methods	Assessment Methods
Knowledge and Understanding of • mobile communication technologies, such as digital modulation, equalization, diversity, channel coding and spread spectrum. • the basic principles and implementation of network protocols and their applications • past, current and emerging cellular and personal communication network technologies	Lectures, tutorials	Examination and coursework
Intellectual Skills • Students will learn to adopt engineering approaches to investigating real systems through practical study in laboratory. • Students will develop the ability to analyse and solve engineering problems in answering tutorial questions during/after lectures and through the completion of the laboratory report.	Lectures, tutorials	Examination and coursework
Professional/Subject Specific Skills • practical study in laboratory of wireless LANs • the ability to develop and evaluate methods of presenting information and data	Lectures, tutorials	Examination and coursework
Transferable Skills • research and reading skills • information technology skills • the ability of students to reflect upon their own presentation skills	Lectures, tutorials	Examination and coursework

Introductory Learning Resources	Module information, tutorial material and generic feedback will be available on Blackboard
Core Texts, reading list	W. Stallings, Wireless Communications and Networks, Prentice Hall, 2nd ed., 2004. T. Rappaport, Wireless Communications: Principles and Practice, Prentice Hall, 2nd ed., 2002. D. C. Green, Radio Communication, Longman, 2nd ed., 2000. D. Tse and P. Viswanath, Fundamentals of Wireless Communication, Cambridge, 2005. H. Walke, Mobile Radio Networks, John Wiley & Sons, 2nd ed., 2002. S. Haykin and M. Moher, Modern Wireless Communications, Prentice Hall, 2005. B. Forouzan, Data Communications and Networking, McGraw-Hill, 4th ed., 2006. A. S. Tanenbaum, Computer Networks, Prentice Hall, 4th ed., 2003 F. Halsall, Multimedia Communications, Applications, Networks, Protocols and Standards, Addison-Wesley, 2001.
Specification completed by: Date	Geof Carpenter 23.7.09