

Course Title: Fundamentals of Mobile and Pervasive Computing
Course Code: ITEC-620-621
Degree Program: BS(Information Technology) P-IV (2nd semester)
Course rating: 3 credit hours (Theory)
Pre-requisites: Java Programming

Course Objectives:

The "pervasive computing" module aims to provide an understanding of the issues, technologies and concepts underlying the vision of pervasive computing infrastructure, particularly in wireless networks, context-awareness, sensors and programming for limited and mobile devices. The module also provides experience of scientific and engineering techniques of design, experimentation, writing and critical review of literature. This is achieved through a combination of lectures on basic concepts and theory, seminars discussing literature and design, lab exercises in implementing systems with these technologies, and independent study building on this class work. Through the examination of the various topics appropriate experimental methods, including simulation and experimentation, and forms for the analysis of results will be discussed.

Course Outline:

Concepts in mobile and ad-hoc networks, Principles in wireless communications, Addressing and routing in the mobile internet, Identity and routing in ad-hoc networks, Identity, routing and in-network processing in sensor networks, Research and practise in context awareness, Classification of context and uses of context, Interfacing to sensors, Resource discovery and system configuration, Location aware computing sensing, modelling, representing and using location information, Design of pervasive computing systems, Programming with memory, CPU and power limitations for mobile devices and sensors, Responding to context and resources: exceptions, errors and recovery, Design and reporting of experiments, Examining the literature related to the above, Research and engineering questions, Running experiments and reporting results

Text Books/Reference Books:

1.This course follows a textbook closely: D. Chalmers "Sensing and Systems in Pervasive Computing" Springer (2011).

In addition the following books are useful reading:

2.Ubiquitous Computing Fundamentals" ed. John Krumm; pub CRC Press 2010

3.Fundamentals of Mobile and Pervasive Computing" Adelstein, Gupta, Richard, Schwiebert; pub McGraw-Hill 2005

4.Protocols and Architectures for Wireless Sensor Networks" Karl, Willig; pub Wiley 2007

5.Wireless Sensor Networks" Sohrawy, Mimoli, Znati; pub Wiley 2007

6.Smart Environments" Cook, Das; pub Wiley 2005

7.Networking Wireless Sensors" Bhaskar Krishnamachari; pub Cambridge 2005

Course Title:	Professional Practice
Course Code:	ITEC 422-423
Degree Program:	BS(Information Technology) P-IV (2nd semester)
Course rating:	2 credit hours (Theory)
Pre-requisites:	None

Course Objectives:

The purpose of this course is to present material in the key areas of professionalism, finance, health and safety, and intellectual property in a more unified fashion, in the context of the software industry.

Syllabus Outline:

Engineering Profession: Engineering basics, structure of engineering profession, development of engineering profession, ethics and Software Engineering, strands in ethical thinking, professional codes of conduct,

Organizations and their Structures: Limited companies, private and public, partnerships, sole traders, Special features of limited companies, responsibilities of directors

Company Finance: The need for capital; investment and working capital; sources of funds; equity capital and loan capital, Cash flow and its importance, Costing: fixed costs and variable costs; overheads; opportunity costs; depreciation; Problems of cost allocation; Budgeting; Assessment of capital investment; Discounted cash flow analysis, with particular reference investment in software tools and new product development; Financial accounts: balance sheets, profit and loss accounts, cash flow statements; The treatment of software in company accounts; Ownership of rights in software as goodwill.

Anatomy of Software House: The Company, Company Structure, management of staff, producing of budget, monitoring financial performance, producing budgets

Computer Contracts and Intellectual Property Rights: The nature of intellectual property; the law relating to different types of intellectual property (confidential information, copyright, trade marks, patents) and the relevance of each type to the software industry.

Computer Misuse and Criminal Law: Computing and Criminal Activity, Reform the criminal law, categories of misuse, computer fraud, obtaining unauthorized access to computer.

Data Protection: Data protection and privacy, the impact of the internet, factors influencing regulations of data processing,

The Engineering Profession: The structure of the engineering profession, both in the Pakistan and abroad, Professional codes of conduct and codes of practice.

Learning Material/References:

*** Professional Issues in Software Engineering, M.F. Bott et al.**

Course Title: Project
Course Code: ITEC-630
Degree Program: BS(Information Technology) P-IV (2nd semester)
Course rating: 6 credit hours (Theory)
Pre-requisites:

Course Objectives:

The course is offered by all faculty of Institute of Information and Communication Technology jointly. The purpose of this course is to engage the students in a research project under the close supervision of a faculty member of IICT. Topics are offered by the individual faculty members. A report of presentation discussing approach, methodology, and results will be submitted upon completion.