هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

T-104
2022

Course Specification

Course Title:	**Mobile Computing**
Course Code:	**555 COMP-3**
Program:	**Bachelor in Computer & Network Engineering**
Department:	**Computer Science**
College:	**College of Computer Science and Information Technology**
Institution:	**Jazan University**
Version:	**V2**
Last Revision Date:	**12 March 2023**

Table of Contents:

A. General information about the course:

Course Identification					
1. Credit hours:	3				
2. Course type					
a.	University ☐	College ☐	Department☒	Track☐	Others☐
b.	Required ☒	Elective☐			
3. Level/year at which this course is offered:	13 / Year – 5				
4. Course general Description This course provides a comprehensive overview of mobile computing along with its security issues and mobility. The course will give an understanding of mobile agent systems and platforms, multiple access schemes and of various communication satellite systems. The course broadly covers the standard issues and physical mobility's of wireless LANs, mobile IP and mobile TCP. This course focuses on the Routing protocols and issues associated with mobile ad hoc and wireless sensor networks. This course will aware the students with latest trends and technologies of mobile computing.					
5. Pre-requirements for this course (if any): None					
6. Co- requirements for this course (if any): None					
7. Course Main Objective(s) • Explain the fundamental concepts of mobile computing systems and its security issues. • Describe wireless and mobile communications systems and be able to choose an appropriate mobile system from a set of requirements. • Acquire the skills to compare the routing protocols of WSN. • Gain an understanding of mobile agent concepts, characteristics and requirements. • Apply appropriate tools and frameworks for designing and implementing wireless communication systems.					

1. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1.	Traditional classroom	44	80%
2.	E-learning	-	-
3.	Hybrid • Traditional classroom • E-learning	-	-
4.	Distance learning (Self Learning)	8	20%

2. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	Lectures	22
2.	Laboratory/Studio	22
3.	Field	-
4.	Tutorial	-
5.	Others (specify)	8
	Total	52

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	Knowledge and understanding			
1.1	**Describe** fundamental concepts as well as explore both theoretical and practical issues of mobile computing.	K1	Class lectures and lecture notes	Midterm/ Assignment 1 / Final Exam/Final Lab
1.2	**Interpret** structures and components of physical mobility's of wireless communications in mobile environment.	K2	Research papers/ Class lectures/ lecture notes/ Case studies	Midterm /Assignment / Group Assignments/ Final Exam
2.0	Skills			
2.1	**Inspect** the mobile agent's requirements, characteristics and platforms.	S4	Class lectures/ lecture notes/Case studies	Assignment 2/ Final Exam/ Group Assignments

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.2	**Compare** and contrast various routing protocols of Mobile Ad hoc and Wireless Sensor Networks.	S1	Class lectures/ lecture notes/ Case studies / Brainstorming	Final Exam/ Assignments1, 2 /Group Assignments
2.3	**Apply** appropriate strategies, development processes, architecture design and technology to solve the issues of mobile computing systems and application.	S4	Class lectures/ lecture notes	Final Exam/ Assignment 2/ Final Lab
3.0	Values, autonomy, and responsibility			
3.1	**Explain** several securities related issues and emergence of mobile computing on social media.	V1	Small group discussion / Brainstorming/ Class discussion to train students to think independently	Assignment 2/ Group Assignments/ Final Exam

C. Course Content

No	List of Topics	Contact Hours
1.	**Chapter-1: INTRODUCTION** a) Introduction to mobility: Mobile Computing, Technical issues for mobility Self-study: Mobile Agents b) Wireless and cellular communication: Communication satellites-GEO, LEO, MEO; Multiple-access schemes-FDMA, CDMA, CDMA; Table- Generation of cellular communication Self-Study: Generation of cellular communication (1st - 5th Generation) detail.	4T + 4P
2.	**Chapter – 2: WIRELESS NETWORKS** IEEE 802.11 WLAN standards: Physical layer, MAC layer, services	

	Bluetooth: Applications, protocol stacks, advantages, tracking services a) Infrared systems; Hiper LAN; WiMAX Self-Study: Need for new wireless standards	4T + 4P
3.	**Chapter – 3 PHYSICAL MOBILITY** a) The requirements for physical mobility: wireless communication, mobility, portability b) IPv4, IPv6, Mobile IP: goals c) Mobility support in IPv4 and IPv6 d) TCP for mobility: Indirect, Snooping Self-Study: Cellular IP, routing and paging cache	4T + 4P
4.	**Chapter – 4 MOBILE Ad Hoc NETWORKS** **a)** MANET characteristics, classification, traditional routing protocols-requirements b) Routing protocols: proactive, reactive, dynamic, adaptive on demand, Self-Study: Comparison between DSR & AODV	3T + 3P
5.	**Chapter-5 WIRELESS SENSOR NETWORKS** a) Applications of WSN, Differences from MANET, WSN Architecture b) Routing Protocols- Data centric Self-Study: Design Issue, Hierarchical, location-based routing protocols	3T + 3P
6.	**Chapter – 6 MOBILE INTERNET & AGENTS** a) WAP Introduction, Objective, Infrastructure, b) WAP gateway c) Push operation, pull operation Self-Study: WAP Protocol Stack, WAP 2.0 d) Mobile agents: Characteristics, architecture- mobile agent, client server and mobile agent Self-Study: Requirements for mobile agent systems	4T + 4P
7.	**Chapter – 7 SECURITY ISSUES IN MOBILE COMPUTING** a) Security treats to wireless networks b) IEEE 802.11 security Self-Study: WAP 2.0 security Bluetooth security	2T + 2P
8.	Lab Exam + Revision	2T + 2P
Total		52

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Assignments	4th week	20%
2.	Midterm Exam	6th week	20%
3.	Lab Exam	11th week	20%
4.	Final Theory Exam	12th week	40%

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.)

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	KumkumGarg, "Mobile Computing: Theory and Practice", Pearson Education, Printed 2012, ISBN: 978-81-317-3166-6.
Supportive References	i). Reza B'Far, "Mobile Computing Principles", Cambridge University Press, 2003, ISBN: 978-0-511-54696-9. ii). John Schiller, "Mobile Communications, Pearson Education", Second Edition, 2004. ISBN: 0 321 12381 6. iii). Asoke K Talukde, "Mobile Computing: Technology, Applications and Service Creation", 2nd Edition, Tata McGraw Hill, 2010. ISBN: 978-0-07-014457-6.
Electronic Materials	• **Blackboard:**https://lms.jazanu.edu.sa/webapps/portal/execute/tabs/tabAction?tab_tab_group_id=_1_1 • **Online Fedora support:** http://technet.microsoft.com/en-us/windowsserver/default.aspx www.Fedora.org • Purdue University : www.cs.purdue.edu • University of New South Wales : www.cse.unsw.edu.au/ • York University: www.cs.yorku.ca • IIT- Madras : www.iitm.ernet.in • New york University: www.cs.nyu.edu
Other Learning Materials	Online tutorial

2. Required Facilities and equipment

Items	Resources
Facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	• Classroom equipped with projector, whiteboard, and sufficient seating arrangements. • Lab with software installed and individual computer terminal for each student.

Items	Resources
Technology equipment (projector, smart board, software)	• Whiteboards and projectors for classroom and labs • Computer Lab equipped with 30 PCs having J2ME platform in Net beans 7.0 • An active internet connection.
Other equipment (depending on the nature of the specialty)	None

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students	Indirect (Course evaluation survey form)
Effectiveness of students assessment	CRC / QAU / HoD	Direct (Course reports / result analysis)
Quality of learning resources	Track leaders / CRC	Indirect (Review, meetings and star rating with suggestions for further modification and improvements)
The extent to which CLOs have been achieved	CRC / QAU	Direct (CLO assessment template further verified at course coordinator, Track leader and QAU level)
Other		

Assessor (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval Data

COUNCIL /COMMITTEE	DEPARTMENT COUNCIL
REFERENCE NO.	29126
DATE	17/3/1444