هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

اعتماد
NCAA

2024

TP-153

Course Specification

(Bachelor)

Course Title:	Mobile and Wireless Network
Course Code:	421CCN-3
Program:	Bachelor of Science in Computer Networks
Department:	Networks and Communications Engineering
College:	Computer Science and Information Systems
Institution:	Najran University
Version:	1.0
Last Revision Date:	Feb 2024

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:					
3 (2, 2, 1) [Theory, Lab, Tutorial]					
2. Course type					
A.	☐University	☐College	☒ Department	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (Level 7 / Year 4)					
4. Course general Description:					
The purpose of this course is to develop advanced network building skills and to study performance issues in advanced wireless and mobile networks. It covers current topics in wireless and mobile networks, including wireless media access control protocols, wireless network routing, congestion control, location management, mobile transport protocols and quality of service in wireless networks. It also investigates other areas important in the design of wireless and mobile networks required for supporting mobile distributed applications, including mobile middleware and object architecture, mobile transaction, remote execution and mobile RPC, and cache strategies for wireless networks. Other recent areas that are increasingly important are wireless ATMs and multimedia communication support.					
5. Pre-requirements for this course (if any):					
201CCN-4					
6. Co-requisites for this course (if any):					
N/A					

7. Course Main Objective(s):

Upon the successful completion of this course, students will be able to:

- Describe the wireless communications technologies and basic architecture of the wireless communication system.
- Explain the challenges in wireless communication such as multipath, media access control, wireless network routing, congestion control and quality of service.
- Illustrate the wireless LAN networks using IEEE 802.11 standard.
- Understand cellular networks in terms of evolution, architecture and standards i.e. GSM.
- Principles of addressing and routing to mobile users; Mobile IP, handling mobility in networks and higher layer protocols.
- Wireless ATM and multimedia communication support.

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	100%
2	E-learning		
3	Hybrid • Traditional classroom • E-learning		
4	Distance learning		

3. Contact Hours (based on the academic semester)

No	Activity		Contact Hours
1.	**Lectures**	[2 contact hours ´ 15 weeks]	30
2.	**Laboratory/Studio**	[2 contact hours ´ 15 weeks]	30
3.	**Field**		
4.	**Tutorial**	[1 contact hour 15 weeks]	15
5.	**Others (specify)**		
Total			75

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 the wireless communications technologies and basic architecture of the wireless communication system.	K2	TS: 1-Interactive Lectures using PowerPoint slides and explaining the essential points in more detail with the help of a whiteboard. TS: 2- Encouraging the students to use the online links to know the concepts in detail. TS: 3 – Recall the topics discussed in the last lecture by asking questions to the students. TS: 4 – Motivating students to be active during class by asking questions regularly during the lecture. TS: 5 – Associating the topics in with the course learning outcomes (CLO).	**Indirect:** - Students CLO Survey **Direct:** - Quizzes. - Assignment. - Midterm exam (Exam consists of multiple-choice questions, true/false, fill in the blanks, and theoretical questions.) - Final Exam
1.2	Explain the challenges in wireless communication such as multipath, media access control, wireless network routing, congestion control and quality of service.	K1, K2		
1.3	Illustrate the wireless LAN networks using IEEE 802.11 standard.	K2		
2.0	**Skills**			
2.1	Understand cellular networks in terms of evolution, architecture, and standards i.e. GSM.	S6	Lectures, Small Group Work, Small Group Discussions, giving students tutorials related to scheduling algorithms, thread, memory management etc. Motivating students to work in the home, to search on the internet, to read related reference books by giving them assignments related to mobile and wireless communication.	Midterm exam (Each exam consists of multiple-choice questions, true/false, fill-in-the-blanks, and theoretical questions.)
2.2	Principles of addressing and routing	S1	Lectures, Small Group Work, Small Group	Midterm exam (Each exam

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
	to mobile users; Mobile IP, handling mobility in networks and higher layer protocols.		Discussion, giving students tutorials related to scheduling algorithms, thread, memory management etc. Motivating students to work in the home, to search the internet, to read related reference books by giving them assignments related to mobile and wireless communication.	consists of multiple-choice questions, true/false, fill-in-the-blanks, and theoretical questions.)
2.3	Wireless ATM and multimedia communication support.	S1, S6	Lectures, Small Group Work, Small Group Discussions, giving students tutorials related to scheduling algorithms, thread, memory management etc. Motivating students to work in the home, to search on the internet, and to read related reference books by giving them assignments related to mobile and wireless communication.	Midterm exam (Each exam consists of multiple-choice questions, true/false, fill-in-the-blanks, and theoretical questions.)
2.4	To illustrate the important components of communication skills and based on developing critical skills, observations, experiments, and feedback.	S5	Lectures, Small Group Work, Small Group Discussion, giving students tutorials related to scheduling algorithms, thread, memory management etc. Motivating students to work in the home, to search on the internet, to read related reference books by giving them assignments related to mobile and wireless communication.	Midterm exam (Each exam consists of multiple-choice questions, true/false, fill-in-the-blanks, and theoretical questions.)
3.0	**Values, autonomy, and responsibility**			
3.1				

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.2				
...				

C. Course Content

No	List of Topics	Contact Hours
1.	Overview of wireless network	5
2.	Characteristics of the wireless medium	5
3.	Physical layer alternatives for wireless networks	10
4.	Wireless medium access alternatives	5
5.	Network planning	5
6.	Wireless network operation	5
7.	GSM and TDMA technology	5
8.	CDMA technology, IS-٩٥ and IMT-٢٠٠٠	5
9.	Mobile Data Networks	5
10.	Introduction to wireless LANs	5
11.	IEEE ٨٠٢,١١ WLANS	5
12.	Wireless ATM and HIPERLAN	5
13.	٤G and ٥G Wireless networks	5
14.	Ad Hoc Networking and WPAN	5
	Total	**75**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz and Assignment	٢	١٠%
2.	Midterm Examination ١	8th week	20%
3.	Lab Activities	1st to 14th week	١٠%
4.	Lab Final Examination	15th week	١٠%
5.	Final Examination	16th to 18th week	٤٠%

*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	Kaveh Pahlavan, Prashant Krishnamoorthy, Principles of Wireless Networks - A united approach –John Wiley & Sons Inc., 2nd Revised edition, ISBN: 0470697083.
Supportive References	1. Mazliza Othman, Principles of Mobile Computing & Communications, Auerbach 2007, ISBN: 1420061585. 2. 2. David Tse, Fundamentals of Wireless Communication, Cambridge University Press, 2005, ISBN: 0521845270. 3. Amitabh Kumar, Mobile broadcasting with WiMAX:Principles Technology and Applications, Focal Press, 2008, ISBN: 0240810406 4. John Ross, The Book of Wireless: A Painless Guide to WiFi and Broadband Wireless, Starch Press, 2008, ISBN: 1593271697. Note: Handouts will be distributed in class, when appropriate, to cover some of the course topics.
Electronic Materials	
Other Learning Materials	

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	Lecture Rooms with 30 seats and a whiteboard or a smartboard.
Technology equipment (projector, smart board, software)	Desktop/ Laptop computer Multimedia Projector
Other equipment (depending on the nature of the specialty)	A File cabinet to keep Class Stuff, Markers, papers and student Files, and a printer to print program screenshots.

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	Students, instructors and peer review	- Online course survey: By the end of each semester, students give their opinions about many factors in the course. They give feedback about teaching strategies, assessment methods, textbooks, instructors, etc. - Feedback about Course Learning Outcomes (CLOs): A course survey is

Assessment Areas/Issues	Assessor	Assessment Methods
		distributed to students to get their opinions about the CLOs.
Effectiveness of students' assessment	Instructor, faculty, and student	- Discussion with other faculty members about students' understanding and the best way of teaching them. - Peer consultation on teaching - Discussions within the group of faculties teaching the same course before
Quality of learning resources	Instructor and Faculty	- Describe the relationship between the course's topics and CLOs. - Course syllabus must be distributed in the first week. It should contain the necessary information about the course (CLOs, assessment methods, descriptions, etc.) - Feedback from the students about the understanding of lectures in academic advising hours. - Analysis of the critical topics with real-life examples and preparation of good effective PPT slides. - By suggesting good teaching methodologies - Ensure that all students participate in the class. - Encourage students to attend during office hours to clarify their doubts.
The extent to which CLOs have been achieved	Peer and instructor	- The course coordinator has to approve the exams and grades of students in exams. - The curriculum committee will review all courses by the end of each semester and approve actions and improvements plan to be carried out. - Getting feedback from the students who will pass the course and work in the practical field. - The vice dean and the dean of the college have to approve the final grades.
the planning arrangements for periodically reviewing course effectiveness and planning for improvement	Instructor	- Each semester, the instructor has to teach the course according to the previous course materials (Course specification, report, improvement plan, etc.). - By the end of each semester, the instructor must prepare a course file which contains all activities and practices taken in the course. Achievements of CLOs can be used if the students' levels improved or not

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	NETWORK AND COMMUNICATIONS ENGINEERING DEPARTMENT COUNCIL
REFERENCE NO.	**14450824-0482-00014**
DATE	**5/3/2024**