



# Course Specification

## (Bachelor)

Course Title: **Multimedia Networks and Applications**

Course Code: **403CCN-3**

Program: **Bachelor of Science in Computer Networks**

Department: **Networks and Communications Engineering**

College: **College of Computer Science and Information Systems**

Institution: **Najran University**

Version: **1.0**

Last Revision Date: **Feb 2024**



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## 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:

This course explains and discusses key concepts of Multimedia networking, including Introduction: Digital Audio, Graphics and Video, Voice over IP (VoIP); Characteristics of Multimedia; Multimedia perceptual quality: Frame rate, Delay, Jitter, Loss; Compression standards; QoS; an overview of current multimedia applications (e.g., media-on-demand, Internet Telephony, online gaming).

#### 5. Pre-requirements for this course (if any):

201CNN-3

#### 6. Co-requisites for this course (if any):

N/A

#### 7. Course Main Objective(s):

After completing the course students will be able to

- Describe multimedia compression techniques and standards,
- Describe and analyze QoS mechanisms and protocols,
- Conduct performance analysis.
- Discuss and evaluate multimedia over wireless networks.
- Demonstrate understanding of how to conduct performance evaluation through a basic evaluation of the VoIP application.



- Demonstrate understanding of streaming audio by building a Voice over IP (VoIP) application from scratch.
- Apply the knowledge and methods of multimedia applications in real networks.

## 2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	75	100%
2	E-learning		
3	Hybrid <ul style="list-style-type: none"> <li>• Traditional classroom</li> <li>• E-learning</li> </ul>		
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)	
<b>Total</b>		<b>75</b>

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and understanding</b>			
1.1	Define the concepts and terminologies of multimedia networks and applications.	K1	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	<b>Indirect:</b> - Students CLO Survey <b>Direct:</b> - Quizzes. - Assignment.





Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
			<p>links to know the concepts in detail.</p> <p>TS: 3 – Recall the topics discussed in the last lecture by asking questions to the students.</p> <p>TS: 4 – Motivating students to be active during class by asking questions regularly during the lecture.</p> <p>TS: 5 – Associating the topics with the course learning outcomes (CLO).</p>	<ul style="list-style-type: none"> <li>- Midterm exam (Exam consists of multiple-choice questions, true/false, fill in the blanks, and theoretical questions.)</li> <li>- Final Exam</li> </ul>
1.2	Analyze QoS mechanisms and protocols	K2	<p>TS: 1-Interactive Lectures using PowerPoint slides and explaining the essential points in more detail with the help of a whiteboard.</p> <p>TS: 2- Encouraging the students to use the online links to know the concepts in detail.</p> <p>TS: 3 – Recall the topics discussed in the last lecture by asking questions to the students.</p> <p>TS: 4 – Motivating students to be active during class by asking questions regularly during the lecture.</p> <p>TS: 5 – Associating the topics in with the course learning outcomes (CLO).</p>	<p><b>Indirect:</b></p> <ul style="list-style-type: none"> <li>- Students CLO Survey</li> </ul> <p><b>Direct:</b></p> <ul style="list-style-type: none"> <li>- Quizzes.</li> <li>- Assignment.</li> <li>- Midterm exam (Exam consists of multiple-choice questions, true/false, fill in the blanks, and theoretical questions.)</li> <li>- Final Exam</li> </ul>
...				
<b>2.0</b>	<b>Skills</b>			
2.1	Evaluate the performance and different issues of multimedia networks and applications.	S1, S6		
2.2	Explain various VoIP, Wireless VoIP, IPTV, media-on-demand.	S6		



Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
2.3	Apply the knowledge and methods of multimedia networks and applications in real multimedia networks.	S5		
<b>3.0</b>	<b>Values, autonomy, and responsibility</b>			
3.1				
3.2				
...				

### C. Course Content

No	List of Topics	Contact Hours
1.	Introduction to Multimedia Networking	5
2.	Multimedia compression	10
3.	QoS mechanisms (scheduling, admission control)	10
4.	multicasting techniques	10
5.	Multimedia Streaming	10
6.	Protocols for Real-time Interactive Applications	10
7.	Synchronization and Adaptation	5
8.	Integrated Services and Differentiated Services	5
9.	VoIP	5
10.	Wireless VoIP	5
<b>Total</b>		<b>75</b>

### D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Quiz and Assignment	2, 4, 8	20





No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
2.	Midterm Examination	8 <sup>th</sup> week	20
3.	Lab Activities	1 to 14 <sup>th</sup> week	10
4.	Lab Final Examination	15 <sup>th</sup> week	10
5.	Final Examination	16 to 18 <sup>th</sup> 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

<b>Essential References</b>	Multimedia Networks: Protocols, Design and Applications, Hans W. Barz, Gregory A. Bassett, Wiley, 2016.
<b>Supportive References</b>	<ol style="list-style-type: none"> <li>1. Multimedia: Concepts and Practice, Stephen McGloughlin, November 2000, Prentice Hall</li> <li>2. Multimedia Communication Systems, K. Rammohanarao, Z. S. Bolzkovic, D. A. Milanovic, 1st edition, Prentice Hall, May 2002.</li> <li>3. Multimedia Communications: Applications, Networks, Protocols, and Standards. Fred Halsall. Pearson Education, 2001</li> </ol>
<b>Electronic Materials</b>	Available in Blackboard
<b>Other Learning Materials</b>	Collaboration Networks Lab (VoIP & Video)

### 2. Required Facilities and equipment

Items	Resources
<b>facilities</b> (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	<ol style="list-style-type: none"> <li>1. Lecture Rooms with 20 seats with smart table, Mic, Speaker, PC, Auto Projector with Screen and a whiteboard or a smart board (male Section).</li> <li>2. Collaboration Networks Lab (VoIP &amp; Video)</li> </ol>
<b>Technology equipment</b> (projector, smart board, software)	<ol style="list-style-type: none"> <li>1. Desktop/ Laptop computer Multimedia Projector</li> <li>2. The laboratory contains enough number of PC to accommodate all students with Java-related software like JCreator, J2SE,</li> <li>3. NetBeans, Eclipse and JRE licensed version with network packages installed.</li> </ol>
<b>Other equipment</b> (depending on the nature of the speciality)	A File cabinet to keep class stuff, papers and students' 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	<ul style="list-style-type: none"> <li>- 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.</li> <li>- Feedback about Course Learning Outcomes (CLOs): A course survey is distributed to students to get their opinions about the CLOs.</li> </ul>
Effectiveness of students' assessment	Instructor, faculty, and student	<ul style="list-style-type: none"> <li>- Discussion with other faculty members about students' understanding and the best way of teaching them.</li> <li>- Peer consultation on teaching</li> <li>- Discussions within the group of faculties teaching the same course before</li> </ul>
Quality of learning resources	Instructor and Faculty	<ul style="list-style-type: none"> <li>- Describe the relationship between the course's topics and CLOs.</li> <li>- Course syllabus must be distributed in the first week. It should contain the necessary information about the course (CLOs, assessment methods, descriptions, etc.)</li> <li>- Feedback from the students about the understanding of lectures in academic advising hours.</li> <li>- Analysis of the critical topics with real-life examples and preparation of good effective PPT slides.</li> <li>- By suggesting good teaching methodologies</li> <li>- Ensure that all students participate in the class.</li> <li>- Encourage students to attend during office hours to clarify their doubts.</li> </ul>
The extent to which CLOs have been achieved	Peer and instructor	<ul style="list-style-type: none"> <li>- The course coordinator has to approve the exams and grades of students in exams.</li> <li>- The curriculum committee will review all courses by the end of each semester and approve actions and improvements plan to be carried out.</li> <li>- Getting feedback from the students who will pass the course and work in the practical field.</li> <li>- The vice dean and the dean of the college have to approve the final grades.</li> </ul>
the planning arrangements for periodically reviewing course effectiveness and planning for improvement	Instructor	<ul style="list-style-type: none"> <li>- Each semester, the instructor has to teach the course according to the previous course materials (Course specification, report, improvement plan, etc.).</li> </ul>





Assessment Areas/Issues	Assessor	Assessment Methods
		- 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

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

