



## Course Specifications

<b>Course Title:</b>	Data Communications
<b>Course Code:</b>	503410-3
<b>Program:</b>	Bachelor in Computer Science
<b>Department:</b>	Department of Computer Engineering
<b>College:</b>	College of Computers and Information Technology
<b>Institution:</b>	Taif University

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## A. Course Identification

<b>1. Credit hours:</b> 3 hours
<b>2. Course type</b> <b>a.</b> University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/> <b>b.</b> Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b> Level 10/ year 4
<b>4. Pre-requisites for this course (if any):</b> Digital logic design 503221-4
<b>5. Co-requisites for this course (if any):</b> None

## 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	5	100%
2	Blended		
3	E-learning		
4	Distance learning		
5	Other		

## 7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	50
2	Laboratory/Studio	
3	Tutorial	
4	Others (specify)	
	<b>Total</b>	50

## B. Course Objectives and Learning Outcomes

<p><b>1. Course Description</b></p> <p>The course is designed to provide the students with the fundamental concepts and techniques of data communications. The course includes the following topics; Meaning, history and need for data communications, Modes of transmission, Signal characteristics, Model of data communications systems, Digital transmission of analog data, Sampling Theory, Pulse modulation techniques, Pulse code modulation, Delta modulation, Data compression, Transmission of digital data, Analog transmission of digital data, Digital transmission of digital data, Common transmission media, Transmission impairments, Channel capacity, Multiplexing techniques, Error Control of Data Transmission, Methods of controlling errors, Types of errors, Error detection codes, Automatic repeat request schemes, Error correcting codes.</p>
<p><b>2. Course Main Objective</b></p> <p>This course Introduces essential components of an end-to-end data communication system and Present analog and digital coding and transmission of data. Errors control techniques are also developed.</p>



### 3. Course Learning Outcomes

CLOs		Aligned PLOs
1	<b>Knowledge and Understanding</b>	
1.1	Develop techniques for transmission and reception of analog and digital data.	K1
1.2	Deal with errors encountered during data transmission.	K1
2	<b>Skills :</b>	
2.1	Analyze and design data communication system.	S3
2.2	Compare between various transmission media	S3
3	<b>Values:</b>	
3.1		

### C. Course Content

No	List of Topics	Contact Hours
1	Introduction. Meaning of data communications, History of data communications Types of data, importance of data communications. Model of a communication system, classification of communication systems, digital communication systems	5
2	Line configuration, direction of data flow, modes of transmission, signal characteristics	5
3	Digital transmission of analog data: sampling theory	5
4	Pulse modulation, wave coding of analog signals, pulse code modulation, DPCM, Delta modulation, ADM	5
5	Data compression, MidTerm Exam	5
6	Analog and digital transmission of digital data	5
7	Transmission Media: Categories of transmission media, twisted pair cable, coaxial cable, optical fiber, wireless transmission,	5
8	Transmission impairments, channel capacity, multiplexing techniques	5
9	History of Mobile Radio, Fundamentals of Cellular Mobile Radio	5
10	Error Control of Data Transmission Channel Encoder/Decoder. Methods of Controlling Errors. Types of Errors. Error Detection Codes.	5
<b>Total</b>		<b>50</b>

### D. Teaching and Assessment

#### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	<b>Knowledge and Understanding</b>		
1.1	Develop techniques for transmission and reception of analog and digital data.	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
1.2	Deal with errors encountered during data transmission.	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments



<b>2.0</b>	<b>Skills</b>		
2.1	Analyze and design data communication system.	Lecture Discussion Problem Solving	Written Exams Quizzes Assignments
2.2	Compare between various transmission media	Lecture Discussion Problem Solving Student research	Written Exams Quizzes Assignments Student presentation
<b>3.0</b>	<b>Values</b>		
3.1			

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignments	5,7	10%
2	Midterm Exam	6	20%
3	Student presentation	11	5%
4	Quizzes	4,7,8	15%
5	Final Exam	12	50%

\*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

## E. Student Academic Counseling and Support

**Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :**

- Teaching staff provide at least 6 office hours for students to help them in the course as well as in any other academic issues.
- Consultation can also be done 24 hours/ 7days through university Edugate (Tawasol) or emails or BB messages.

## F. Learning Resources and Facilities

### 1.Learning Resources

<b>Required Textbooks</b>	1-Data and Computer Communications, William Stallings, Pearson, 10 <sup>th</sup> , 2013
<b>Essential References Materials</b>	Communication Systems, simon Haykin, John Wiley & sons inc, 4 <sup>th</sup> edition 2004
<b>Electronic Materials</b>	
<b>Other Learning Materials</b>	



## 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	Traditional Classrooms,
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	Data show, Blackboard system
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students	Indirect (Survey) Student surveys and student evaluation
Extent of achievement of course learning outcomes	Students Faculty Curriculum committee	Indirect (Survey) Direct (Course Report) Direct
Quality of learning resources	Program leaders Staff members Students	Indirect (Survey)
Improvement of teaching	Course coordinator	Deficiencies based on student evaluation, course reports, and program assessment.
Verifying standards of student achievement	Curriculum committee	Review CAF (course assessment file) Alumni surveys

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

Council / Committee	CS council
Reference No.	Meeting #12
Date	23-10-1443

