



Model No.12

Course Specifications : Digital Communication

Faculty of Engineering
at Shoubra

University : Benha university

Faculty : Faculty of Engineering at Shoubra

Department : Electrical Engineering Department

1- Course Data

Course Code : ECE 421 Course Title : Digital Communication Study Year : Fourth Year
Specialization :
Teaching Hours:
Lecture : 2 Tutorial : 2 Practical :

2- Course Aim

For students undertaking this course, the aims are to:

- 2.1- **Describe** the basic features of communication systems and to provide students with an understanding of the fundamental of communication immune system, its protective functions.
- 2.2- **List** the types of modulation and its importance, their advantages and disadvantages.
- 2.3- Describe the principles of Information theory and error correction code.

3- Intended Learning Outcomes of Course (ILOS)

a- Knowledge and Understanding

On completing this course, students will be able to:

- a- 1 -Define basics of Digital Transmission (a6)
- a- 2 - Define Modulation and Demodulation Techniques. (a6)
- a-3 – Define Information theory and error correction.(a6)

b- Intellectual Skills

At the end of this course, the students will be able to:

- b-1- Analyze the performance of different error detection and correction schemes. (b16)
- b-2- Analyze the performance of digital communication, coding and decoding systems (b17)

(b16)

c- Professional Skills

On completing this course, the students are expected to be able to:

- c- 1 – Practice computer programming for the design and diagnostics of different Data Link Control and protocols.(c15)

d- General Skills

At the end of this course, the students will be able to:

- d- 1 - Communicate effectively (d3)

4- Course Contents

No.	Topics	No of hours
1	Digital Transmission – Line Coding – Block Coding	6

2	Digital modulation	2
3	High speed Digital access - DSL	2
4	Error Detection	4
5	Error Correction	4
6	Data Link Control and Protocols	4
7	Multiple Access	2

5- Teaching and Learning Methods

- 5.1- Modified Lectures
- 5.2- Class activity
- 5.3- Case study
- 5.4- Assignments / homework

6- Teaching and Learning Methods of Disables

- 6.1- nothing

7- Student Assessment

a- Student Assessment Methods

1	Assignments to assess knowledge and intellectual skills.
2	Quiz to assess knowledge, intellectual.
3	Mid-term exam to assess knowledge, intellectual.
4	Oral exam to assess practical knowledge, intellectual, professional and general skills
5	Final exam to assess knowledge, intellectual.

b- Assessment Schedule

No.	Assessment	Week
1	on	2, 5, 9, 11
2	Quizzes on	4, 6, 10, 12
3	Mid-term exam	8
4	Oral Exam on	14
5	Final exam on	15

c- Weighting of Assessments

Assessment	Weight
Mid_Term Examination	10 %
Final_Term Examination	60 %
Oral Examination	10 %
Practical Examination	0 %
Semester work	15 %
Other types of assessment	5%
Total	100 %

8- List of References

a- Course Notes

- 1- prepared by instructor

b- Books

- 1- Graham Smillie ,Analogue and Digital Communication Techniques | Butterworth-Heinemann ,1999
- 2- Upamanyu Madhow, Fundamentals of Digital Communication ,2012
- 3- John G. Proakis ,Digital Communications (Hill Series in Electrical and Computer Engineering) - 2nd Sub edition | McGraw-Hill Companies ,2008

- Course Instructor : **Dr. Michael Nasief**

- Head of Department : **Prof. Dr. Sayed Aboo-Elsood Ward**



Model No.11A Course Specifications : Digital Communication

Faculty of Engineering
at Shoubra

University : Benha university

Faculty : Faculty of Engineering at Shoubra

Department : Electrical Engineering Department

Matrix of Knowledge and Skills of the course

No.	Topics	week	Basic Knowledge	Intellectual Skills	Professional Skills	General Skills
1	Digital Transmission – Line Coding – Block Coding	1,2,3	a1	b2		d1
2	Digital modulation	4	a1			
3	High speed Digital access - DSL	5	a1,a3			d1
4	Error Detection	6,7	a1	b1		
5	Midterm exam	8	a1,a3	b1		
6	Error Correction	9,10	a2,a3	b1		
7	Data Link Control and Protocols	11,12	a2		c1	
8	Multiple Access	13	a2		c1	
9	Oral Exam	14	a1,a2,a3	b1	c1	d1
10	Final Exam	15	a1,a2,a3	b1		

- Course Instructor: Dr. Michael Nasief

- Head of Department : Prof. Dr. Sayed Aboo-Elsood Ward

Matrix of course content and ILO's

Course Title: Digital Communication **Code:** ECE421 **Lecture:** 2 **Tutorial :** 2 **Practical:** -
Total: 4

Program on which the course is given: B.Sc. Electrical Engineering (Communications)

Major or minor element of program: Major

Department offering the program: Electrical Engineering Department

Department offering the course: Electrical Engineering Department

Academic year / level: Fourth year / second semester **2014-2015**

Date of specifications approval: 20/6/2010

Course content	a1	a2	a3	b1	b2	c1	d1
Digital Transmission – Line Coding – Block Coding	✓				✓		✓
Digital modulation	✓				✓		
High speed Digital access - DSL	✓		✓				✓
Error Detection	✓			✓			
Error Correction		✓	✓	✓			
Data Link Control and Protocols		✓				✓	
Multiple Access		✓				✓	

Matrix of course aims and ILO's

Course Title: Digital Communication

Code: ECE421

Lecture: 2

Tutorial: 2

Practical: -

Total: 4

Program on which the course is given: B.Sc. Electrical Engineering (Communications)

Major or minor element of program: Major

Department offering the program: Electrical Engineering Department

Department offering the course: Electrical Engineering Department

Academic year / level:

Fourth Year / Second Semester 2014-2015

Date of specifications approval: 20/6/2010

Course aims	a1	a2	a3	b1	b2	c1	d1
Evaluate the basic features of communication systems and to provide students with an understanding of the fundamental of communication immune system, its protective functions.	✓			✓	✓		✓
Recognize the types of modulation and its importance, their advantages and disadvantages.		✓				✓	✓
Know the principles of Information theory and error correction code.		✓	✓	✓		✓	✓

Course coordinator:

Course instructor: Dr. Michael Nasief

Head of department: Prof. Dr. Sayed Aboo-Elsood Ward