# COURSE SPECIFICATIONS (2010-2011)

**Benha University** **Faculty of Engineering at Shobra** **Electrical Engineering Department**

## A- Basic Information

**Course Title**: Digital Communications **Code**: ECE 421
**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 / **First** Semester
**Date of specifications approval:** 10/5/2006

## B- Professional Information

**1- Overall aims of course**:

By the end of the course the students will be able to:

- 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.

**2- Intended learning outcomes of course (ILOs)**

By completion of the course, the student should be able to:

**a- Knowledge and Understanding**

a.2) Basics of information and communication technology (ICT).

**b- Intellectual Skills**

b.15) Analyze the performance of digital and analog communication, mobile communication, coding and decoding systems.

**c- Professional and Practical Skills**

c.14) Practice computer programming for the design and diagnostics of digital and analog communication, mobile communication, coding and decoding systems.

**d- General and Transferable Skills**

d.3) Communicate effectively

**3- Contents**

| No | Topic | No. of hours | ILOs | Teaching / learning methods and strategies | Assessment method |
|---|---|---|---|---|---|
| 1 | Analog and digital communication systems | 4 | a2, b15, c14, d3 | Lectures, Case study, Assignments / homework | Assignments, Quizes, Oral exam |
| 2 | Coding for discrete sources | 4 | a2, b15, c14, d3 | Lectures, Case study, Assignments / homework | Assignments, Quizes, Oral exam |
| 3 | Coding for discrete sources | 4 | a2, b15, c14, d3 | Lectures, Case study, Assignments / homework | Assignments, Quizes, Oral exam |
| 4 | Channels Modulation and Demodulation | 4 | a2, b15, c14, d3 | Lectures, Case study, Assignments / homework | Assignments, Quizes, Oral exam |

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|---|---|---|---|---|---|
| 5 | Channels Modulation and Demodulation | 4 | a2, b15, c14, d3 | Lectures, Case study, Assignments / homework | Assignments, Quizes, Oral exam |
| 6 | Random Process and noise | 4 | a2, b15, c14, d3 | Lectures, Case study, Assignments / homework | Assignments, Quizes, Oral exam |
| 7 | Random Process and noise | 4 | a2, b15, c14, d3 | Lectures, Case study, Assignments / homework | Assignments, Quizes, Oral exam |
| 8 | Mid term exam | | | | |
| 9 | Wireless digital communication | 4 | a2, b15, c14, d3 | Lectures, Case study, Assignments / homework | Assignments, Quizes, Oral exam |
| 10 | Wireless digital communication | 4 | a2, b15, c14, d3 | Lectures, Case study, Assignments / homework | Assignments, Quizes, Oral exam |
| 11 | Information theory and error correction | 4 | a2, b15, c14, d3 | Lectures, Case study, Assignments / homework | Assignments, Quizes, Oral exam |
| 12 | Information theory and error correction | 4 | a2, b15, c14, d3 | Lectures, Case study, Assignments / homework | Assignments, Quizes, Oral exam |
| 13 | Data Transmission and Receiption | 4 | a2, b15, c14, d3 | Lectures, Case study, Assignments / homework | Assignments, Quizes, Oral exam |
| 14 | Data Transmission and Receiption | 4 | a2, b15, c14, d3 | Lectures, Case study, Assignments / homework | Assignments, Quizes, Oral exam |

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|---|---|
| 15 | Final exam |
| 16 | |

**4- Teaching and Learning Methods**

Lectures
Class activity
Case study
Assignments / homework

**5- Student Assessment Methods**

Assignments to assess knowledge and intellectual skills.
Quiz to assess knowledge, intellectual and professional skills.
Mid-term exam to assess knowledge, intellectual, professional and general skills.
Oral exam to assess knowledge and intellectual skills.
Final exam to assess knowledge, intellectual, professional and general skills.

**Assessment Schedule**

Assessment 1 on weeks 2, 5, 9, 11
Assessment 2 Quizzes on weeks 4, 6, 10, 12
Assessment 3 Mid-term exam on week 8
Assessment 4 Oral Exam on week 14
Assessment 5 Final exam on week 15

**Weighting of Assessments**

05% Home assignments
05% Quizzes
10% Mid-term examination
20% Oral examination

60% Final-term examination
100% Total

**6- List of References**

Course notes

Course notes prepared by instructor.

Essential books

Analogue and Digital Communication Techniques
by: Graham Smillie
en | Butterworth-Heinemann
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Fundamentals of Digital Communication
by: Upamanyu Madhow

Recommended books

Digital Communications (Mcgraw Hill Series in Electrical and Computer Engineering) - 2nd Sub edition
by: John G. Proakis
en | McGraw-Hill Companies

**7- Facilities required for teaching and learning**

Lecture room equipped with overhead projector
Presentation board, computer and data show
Laboratory

**Course coordinator:** Prof. Dr. Mousa Abd-Allah
**Course instructor:** Dr. Hussam M. Elbehiery

**Head of Department:** Prof. Dr. Mousa Abd-Allah Date: 1/1/2012