



Shoubra Faculty of
Engineering

Model No.12

Course Specifications : Computer Networks1

University : Benha university

Faculty : Shoubra Faculty of Engineering

Department : Electrical Engineering Department

1- Course Data

Course Code : ECE413C Course Title : Computer Networks1 Study Year : Fourth Year

Specialization :

Teaching Hours:

Lecture : 3

Tutorial : 2

Practical :

2- Course Aim

For students undertaking this course, the aims are to:

2.1- Introduction to communication networks, applications, OSI model, data encoding and signal transmission, error detection and correction ,multiple access techniques, LAN networks concept, internetworking, routing techniques, network protocols .

3- Intended Learning Outcomes of Course (ILOS)

a- Knowledge and Understanding

On completing this course, students will be able to:

- a- 1 - Understand concepts and theories of mathematics and sciences, appropriate to the computer networks.
- a- 2 - Know the basics of information and communication technology (ICT)
- a- 3 - define characteristics of engineering materials in the computer networks.
- a- 4 - Understand the different methodologies of solving network problems.
- a- 5 - Conduct related research and current advances in the field of computer networks.

b- Intellectual Skills

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

- b- 1 - Select appropriate solutions for engineering problems based on analytical thinking.

b- 2 -Think in a creative and innovative way in problem solving and design.

b- 3 - Assess and evaluate the characteristics and performance of components, systems and processes.

c- Professional Skills

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

c- 1 - Use a wide range of analytical tools, techniques, equipment, and software packages pertaining to the discipline and develop required computer programs.

c- 2 - Apply safe systems at work and observe the appropriate steps to manage risks.

d- General Skills

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

d- 1 - Collaborate effectively within multidisciplinary team.

d- 2 - Communicate effectively

d- 3 - Effectively manage tasks, time, and resources.

4- Course Contents

| No. | Topics |
|-----|---|
| 1 | Introduction |
| 2 | Network Models : OSI and Internet |
| 3 | Data and Signals |
| 4 | Analog-to-analog Conversion |
| 5 | Transmission Media |
| 6 | Multiplexing, Switching, and Using Telephone and Cable Networks for Data Transmission |
| 7 | Error detection and Correction |
| 8 | Data Link Control |
| 9 | Ethernet and Multiple Access |
| 10 | Connecting LANs, Backbone Networks, and VLANs |
| 11 | Network Layer : IPv4 |
| 12 | Network Layer : Address Mapping, Error Reporting, Delivery, Forwarding, and Routing |
| 13 | Transport Layer : Process-to-Process Delivery, UDP, TCP |

5- Teaching and Learning Methods

- 5.1- Lectures
- 5.2- Tutorials
- 5.3- Computer-lab Sessions
- 5.4- Web-site Searches
- 5.5- Independent Work
- 5.6- Group Work
- 5.7- Case Studies
- 5.8- Simulation Analysis
- 5.9- Presentations

6- Teaching and Learning Methods of Disables

- 6.1- Not available

7- Student Assessment

a- Student Assessment Methods

| | |
|---|---|
| 1 | laboratory Assignment to assess knowledge and intellectual skills. |
| 2 | Project assignments to assess knowledge, intellectual and professional skills. |
| 3 | Mid-term exam to assess knowledge, intellectual, professional and general skills. |
| 4 | Quizes to assess knowledge, intellectual, professional and general skills. |
| 5 | Final exam to assess knowledge, intellectual, professional and general skills. |

b- Assessment Schedule

| No. | Assessment | Week |
|-----|----------------------|----------------|
| 1 | Lab Assessment 1 | 2, 5, 9, 11 |
| 2 | Project Assessment 2 | 10, 11, 12 ,13 |
| 3 | Mid-term exam | 8 |
| 4 | quizes | 2,4,6,10 |
| 5 | Final exam | 15 |

c- Weighting of Assessments

| Assessment | Weight |
|------------------------|--------|
| Mid_Term Examination | 20 % |
| Final_Term Examination | 60 % |
| Oral Examination | 20 % |
| Practical Examination | 0 % |
| Semester work | 0 % |

| | |
|---------------------------|-------|
| Other types of assessment | 0 % |
| Total | 100 % |

8- List of References

a- Course Notes

- 1- Forouzan, B., "Data Communications and Networking", 4rd Edition, McGraw-Hill , 2006

b- Recommended Books

- 1- Tanenbaum, A., "Computer Networks", 4th Edition, Prentice Hall, ISBN: 0-13-0384887 (2003).
- 2- Kurose, J. and Ross, R., "Computer Networking", 3rd Edition, Addison Wesley; ISBN: 0201976994 . (2004).
- 3- Douglas, C., "Computer Networks and Internets with Internet Applications", 3rd Edition, Prentice Hall ISBN 0-13-0914495 (2001).
- 4- Larry Peterson and Bruce Davie , "Computer Networks – A System's system's Approach", 4th edition , Morgan Kaufmann, ISBN: 978-0-12-370548-8
- 5- Stallings, W. "Data and Computer Communications" 8th edition; Prentice Hall 2007; ISBN 0132433109

c- Web Sites

- 1- http://highered.mcgraw-hill.com/sites/0072515848/information_center_view0/
- 2- <http://www.unex.berkeley.edu/cat/course178.html>

University : Benha university

Faculty : Shoubra Faculty of Engineering

Department : Electrical Engineering Department

| No. | Topics | week | Basic Knowledge | Intellectual Skills | Professional Skills | General Skills |
|-----|---|------|-----------------|---------------------|---------------------|----------------|
| 1 | Introduction | 1 | a1 | | | |
| 2 | Network Models : OSI and Internet | 1,2 | a.1, a.2, a2 | b2 | c2 | |
| 3 | Data and Signals | 2,3 | a.1, a.2, a2 | | c2 | d.1,d2,d3 |
| 4 | Analog-to-analog Conversion | 3,4 | a.1, a.2, a2 | b2, b3 | c2 | d.1,d2,d3 |
| 5 | Transmission Media | 4,5 | a.3 | | c2, c1 | |
| 6 | Multiplexing, Switching, and Using Telephone and Cable Networks for Data Transmission | 5,6 | a.2, a.3 | b2 | c2, c1 | d.1,d2,d3 |
| 7 | Error detection and Correction | 6,7 | a1,a2 | b1,b2 | c2 | d.1 |
| 8 | Mid Term Exam | 8 | a.1, a.2, a2,a1 | b1,b2 | | d3 |
| 9 | Data Link Control | 9 | a.2,a2,a1 | b2 | c2, c1 | d2 |
| 10 | Ethernet and Multiple Access | 10 | a.1, a.2, a2,a1 | b3 | c2, c1 | |
| 11 | Connecting LANs, Backbone Networks, and VLANs | 11 | a1 | b2, b3 | c1 | d.1,d2,d3 |
| 12 | Network Layer : IPv4 | 12 | a1 | b3 | | d.1,d2,d3 |
| 13 | Network Layer : Address Mapping, Error Reporting,Delivery, Forwarding, and Routing | 13 | a1 | b2, b3 | c1 | d2 |
| 14 | Transport Layer : Process-to-Process Delivery, UDP, TCP | 14 | a.2, a.3 | b2, b3 | c2, c1 | d.1,d2 |
| 15 | Final Exam | 15 | a.1, a.2, a2,a1 | b2, b3 | | d3 |

Matrix of course content and ILO's

Course Title: NetWorks1 **Code:** ECE413C **Lecture:** 3 **Tutorial:** 2

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

Academic year / level: **Forth Year / first semester**

Date of specifications approval: 20/6/2010

| Course content | A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | C1 | C2 | D1 | D2 | D3 |
|---|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Introduction | ✓ | | | | | ✓ | | | | ✓ | ✓ | | |
| Network Models : OSI and Internet | ✓ | | ✓ | ✓ | ✓ | | ✓ | | | ✓ | ✓ | | ✓ |
| Data and Signals | ✓ | | ✓ | ✓ | ✓ | | ✓ | | | ✓ | ✓ | | ✓ |
| Analog-to-analog Conversion | ✓ | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ | |
| Transmission Media | ✓ | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ | |
| Multiplexing, Switching, and Using Telephone and Cable Networks for Data Transmission | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | ✓ | ✓ | |
| Error detection and Correction | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | | | ✓ | ✓ | |
| Data Link Control | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ | ✓ | ✓ | |
| Ethernet and Multiple Access | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ | ✓ | ✓ | |

| | | | | | | | | | | | | | |
|---|---|---|--|---|---|---|---|--|--|---|--|--|--|
| Connecting LANs, Backbone Networks, and VLANs | | ✓ | | | | | | | | ✓ | | | |
| Network Layer : IPv4 | ✓ | ✓ | | | ✓ | ✓ | ✓ | | | ✓ | | | |
| Network Layer : Address Mapping, Error Reporting, Delivery, Forwarding, and Routing | ✓ | ✓ | | | ✓ | ✓ | ✓ | | | ✓ | | | |
| Transport Layer : Process-to-Process Delivery, UDP, TCP | ✓ | ✓ | | ✓ | ✓ | | | | | ✓ | | | |

Course ILOS VS Program ILOS:

| | A1 | A2 | A3 | A5 | A15 | B2 | B3 | B5 | C6 | C8 | D1 | D3 | D6 |
|-----------|-----------|-----------|-----------|-----------|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| A1 | √ | | | | | | | | | | | | |
| A2 | | √ | | | | | | | | | | | |
| A3 | | | √ | | | | | | | | | | |
| A4 | | | | √ | | | | | | | | | |
| A5 | | | | | √ | | | | | | | | |
| B1 | | | | | | √ | | | | | | | |
| B2 | | | | | | | √ | | | | | | |
| B3 | | | | | | | | √ | | | | | |
| C1 | | | | | | | | | √ | | | | |
| C2 | | | | | | | | | | √ | | | |
| D1 | | | | | | | | | | | √ | | |
| D2 | | | | | | | | | | | | √ | |
| D3 | | | | | | | | | | | | | √ |

- Course Coordinator : Prof / Mona Fatma Mohammed Mursi

- Head of Department : Prof/ Sayed Abo-Elsood Sayed Ward