## CIT306 – Computer Networks

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| **Course Name** | Computer Networks |
| **Course Code** | CIT 306 |
| **Course Type** | Area Elective |
| **Course Level** | Undergraduate |
| **AKTS Credit** | 5 ECTS |
| **Course hours per week (Institutional)** | 3 |
| **Practice hours per week** | 1 |
| **Laboratory hours per week** | 1 |
| **Academic Semester** | 2011 -2012 Spring |
| **Course coordinator(s)** | |
| **Instruction system** | |
| **Medium language** | English |
| **Prerequisite** | - |
| **Suggestions related to course** | N/A |
| **Training required** | N/A |
| **Aim of the course** | The major goals of this course are: <br> 1. Enable students to understand state-of-the-art in network (protocols, standards, architectures, and applications) <br> 2. Describe WAN and LAN communication technologies. <br> 3. Describe how data communication has done between network software, how transmission errors detected and corrected <br> 4. Describe real network categories (such as the Internet, ATM, Ethernet, Token Ring). <br> 5. Describe purpose of switching and routing <br> 6. Discuss Network Security. |
| **Learning outcomes** | On successful completion of this course students should: <br><br> 1. Understand the basic concepts and principles of computer networks. <br> 2. Understand Protocols and standards <br> 3. Understand TCP/IP and internet architecture <br> 4. Understand the concept of how communication is done via internet <br> 5. Understand WAN and LAN communication technologies <br> 6. Understand how transmission errors can be detected and corrected by retransmission. <br> 7. Understand Real Networks categories. <br> 8. Understand the purpose of switching and discuss different switching methods. <br> 9. Understand Network Security |

| Course Content | | | |
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| **Course content per week** | **Week** | **Topics** | |
| | | **Theory** | **Practice** |
| | 1<br>13-17 February | **Introduction:** Data Communication and networks | |
| | 2<br>20-24 February | **Introduction**: Protocols, Standards, Standards Organizations, Internet Standards | **Class Assignment :** students should answer the given question related with protocols and standards. |
| | 3<br>27 Feb - 2 Mar | **Basic Concepts:** Line Configuration, Topology, Transmission Mode, Categories of Networks (LAN,WAN,MAN), Internetworks | **Class Assignment :** students should answer the given question related with Basic concepts |
| | 4<br>5-9 March | **Networks Models - OSI and TCP /IP Internet Architecture**: OSI Model, Overall View of OSI Model, Functions of the Layer in OSI Model, TCP/IP Protocol Suite | **Class Assignment :** students should answer the given question related with Network models and TCP/IP architecture |
| | 5<br>12-16 March | **Transmission of Data and Signals:** Periodic and Aperiodic Signals, Analog Signals, , Composite Signals | Quiz1 |
| | 6<br>19-23 March | **Transmission of Data and Signals:** Digital Signals, Transmission impairment, Data rate and limits. | Discussing about Quiz questions solutions |
| | 7<br>26-31 March | **Midterm Examinations Week** | |
| | 8 | **Error Detection and** | **Class Assignment :** students should answer the |

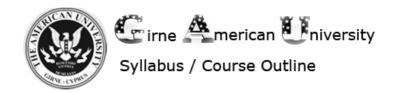| | | | |
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| | 2-6 April | **Correction:** Types of Error, Detection, Vertical Redundancy Check(VRC), Longitudinal Redundancy Check (LRC), Cyclic Redundancy Check (CRC), Checksum, Error Correction. | given question related with Error Detection and Correction<br>Students' presentation about conversion of signals and Data Link Control. |
| | 9<br>9-13 April | **Local Area Networks and Wide Area Networks:** Ethernet, Other Ethernet Networks, Token Bus, Token Ring, Fiber Distributed Data Interface (FDDI), x25,DSL,ISDN. | **Class Assignment :** students should answer the given question related with LAN and WAN communication technologies<br>Students' presentation about Wireless LANs and Internet Protocol. |
| | 10<br>16-20 April | **Switching :** Circuit Switching, Packet Switching, Message Switching. | **Class Assignment :** students should answer the given question related with Switching.<br>Student's presentation about Network Security and Domain Name System |
| | 11<br>23-27 April | **Networking and Internetworking Devices:** Repeaters, Bridges, Routers, Gateways | **Class Assignment :** students should answer the given question related with Networking and internetworking devices<br>Students' presentation about Transmission Media |
| | 12<br>1-4 May | **Internet Addressing:** IP Notation, IP Classes, Network Address, Subnetting, Masking. | Quiz 2 |
| | 13<br>7-11 May | **Network Security:** Symmetric –key Cryptography, Asymmetric key cryptography, security services, message authentication, digital signature. | Discussing about Quiz questions solutions |
| | 14<br>14-18 May | **Review** | |

| Course book and references : | Text Book: <br><br> Behrouz A. Forouzan, Data Communications and Networking, Fourth Edition, Mc Graw-Hill, 2007. <br><br> Resource Books: <br><br> 1. William Stallings, Data and Computer Communications, Seventh Edition, Pearson Prentice-Hall, 2004. <br><br> 2. William Stallings, Business Data Communication, Fourth Edition, Pearson Prentice-Hall, 2001. |
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**Evaluation**

Assignments: 10%
Quizzes: 20%
Attendance 5%
Midterm exam: 30%
Final exam: 35%

| Semester Activities | Number | Contribution percentage to course mark % |
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| Presentations | 1 | 15 |
| Quizzes | 2 | 10 |
| Midterm Exam | 1 | 30 |
| Final Exam | 1 | 40 |
| Attendance | - | 5 |
| TOTAL | | 100 |

**3 Theory Hours X 12 + 2 Practice Hours X 12 + 1 hour midterm + 1 hour final + 1 hour X 2 quizzes + 6 hours X 12 Studying + 14 hours research in library=150/30=5**

**Programme and learning outcomes**

| Learning Outcomes (LO) | Programme Outcomes (PO) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 | PO 13 | PO 14 | PO 15 | PO 16 | PO 17 |
| LO1 | 3 | | 2 | 1 | 1 | | | | 4 | | | 2 | | | | | |
| LO2 | | | | | | | | | 4 | | | | | | | | |
| LO3 | 1 | | | | | | | | 4 | | | | | | | | |
| LO4 | 3 | | 2 | | | | | | 4 | | | | | | | | |
| LO5 | | | | | | | | | 4 | | | | | | | | |
| LO6 | | | | 4 | | | | | 4 | | | | | | | | |
| LO7 | 1 | | | | | | | | 4 | | | | | | | | |
| LO8 | | | | | | | | | 4 | | | | | | | | |
| LO9 | | | | 4 | | | | | 4 | 2 | 3 | | | | | | |

*Contribution Level:
**1** very low **2** low **3** medium **4** high **5** very high