## Faculty of Engineering & Technology

### Telecommunication Networks

**Information :**

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|---|---|---|---|---|---|
| **Course Code :** | COM 520 | **Level :** | Undergraduate | **Course Hours :** | 3.00- Hours |

**Department :** Specialization of Electronics & Communication

**Instructor Information :**

| Title | Name | Office hours |
|---|---|---|
| Associate Professor | Waleed Eid Abd Elrahman Alhanafy | 18 |
| Assistant Lecturer | Nermin Mohamed Fawzy Mahmoud Salem | 5 |

**Area Of Study :**

- Develop student knowledge about the fundamentals of telecommunication and its terminology.
- Prepare students to study and design pulse code modulation systems.
- Train students to evaluate the performance of teletraffic theory and models.

**Description :**

Introduction to telecommunications, Telegraph and telephone, Switching: telegraph, telephone, telex, data, signaling, ISDN, broad band, private switching. Network multiplexing: analog, digital, wavelength division, Data transmission interface equipment: modems, digital data interface equipment, Codecs: audio, video, Copper lines: open wire, twisted pair cable, coaxial cable, Optical fiber technology: types of optical fibers, cables, applications, Radio relay systems, Mobile radio: service mode technology, Satellites: services, technology, digital subscriber lines.

**Course outcomes :**

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| **a.Knowledge and Understanding: :** | |
| 1 - | Explain the fundamentals of telecommunication networks and their terms. |
| 2 - | Interpret the principles of teletraffic theory and its fundamental models. |
| 3 - | Illustrate the applications of teletraffic models in recent network design including VoIP and IP-PBX systems. |
| **b.Intellectual Skills: :** | |
| 1 - | Analyze the performance of telecommunication networks, e.g. pulse code modulation. |
| 2 - | Apply teletraffic theory on different models of telecommunication networks |
| **c.Professional and Practical Skills: :** | |
| 1 - | Apply mathematical background to develop some teletraffic models. |
| 2 - | Use software tools to design the parameters of teleraffic recent networks and evaluate their performance. |
| **d.General and Transferable Skills: :** | |
| 1 - | Collaborate effectively within multidisciplinary team. |
| 2 - | Communicate effectively. |

| Course Topic And Contents : | | | |
|---|---|---|---|
| **Topic** | **No. of hours** | **Lecture** | **Tutorial / Practical** |
| Introductory Topics | 10 | 6 | 4 |
| Transmission and Modulation | 10 | 6 | 4 |
| Digital Networks and Pulse Code Modulation | 15 | 9 | 6 |
| Line Coding and Regenerative Repeaters | 10 | 6 | 4 |
| Fundamentals of Teletraffic Theory | 10 | 6 | 4 |
| Some Basic Teletraffic Models | 10 | 6 | 4 |
| VoIP protocol and IP-PBX systems | 10 | 6 | 4 |

| Teaching And Learning Methodologies : |
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| Interactive Lecturing |
| Problem Solving |
| Discussion |
| Experiential Learning |

| Course Assessment : | | | |
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| **Methods of assessment** | **Relative weight %** | **Week No** | **Assess What** |
| • Final exam | 40.00 | | |
| o Assignment | 10.00 | | |
| o In Class Quizzes | 10.00 | | |
| o Mid-Term exams | 30.00 | | |
| Project | 10.00 | | |

**Recommended books :**

Annabel Z. Dodd, The Essential Guide to Telecommunications, 5th ed., 2012.

Waleed Al-Hanafy, MSc. thesis: “Teletraffic Analysis of the Next-Generation Integrated Terrestrial/Satellite Mobile Radio Networks, http://waleedeid.tripod.com/my_master_thesis.pdf, 2002.