# Course Specification
## (Bachelor)

| | |
|---|---|
| **Course Title:** | Communication System |
| **Course Code:** | 258 CIS-4 |
| **Program** | **Technical support** |
| **Department** | **Computer Department** |
| **College:** | **Applied College** |
| **Institution** | :Najran University |
| **Version** | : 3 |
| **Last Revision Date:** | 1-10-2024 |

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## A. General information about the course:

### 1. Course Identification

| 1. Credit hours: (4 hours ) | | | | | |
|---|---|---|---|---|---|
| | | | | | |
| **2. Course type** | | | | | |
| **A.** | ☐University | ☐College | ☒ Department | ☐Track | ☐Others |
| **B.** | ☒ Required | | ☐Elective | | |
| **3. Level/year at which this course is offered: (4th semester Second year)** | | | | | |
| **4. Course General Description:** | | | | | |
| **This course introduces the fundamentals of electronic communication systems. Topics include the frequency spectrum, electrical noise, modulation techniques, characteristics of transmitters and receivers, digital communications, Transmission and Propagation and Telecommunication Systems..** | | | | | |
| **5. Pre-requirements for this course (if any):** | | | | | |
| **252 CIS-3** | | | | | |
| **6. Co-requisites for this course (if any):** | | | | | |
| NO | | | | | |
| **7. Course Main Objective(s):** | | | | | |
| • **Introduce the main concepts of AM & FM communication systems**<br>• **Interpret analog and digital communication circuit diagrams**<br>• **Analyze transmitter and receiver circuits**<br>• **Calculate the bandwidth and signal-to-noise ratio of a signal at the output of a linear system or filter** | | | | | |

### 2. Teaching mode (mark all that apply)

| No | Mode of Instruction | Contact Hours | Percentage |
|---|---|---|---|
| 1 | Traditional classroom | 4 hours per week | 100% |
| 2 | E-learning | | |
| 3 | Hybrid<br>• Traditional classroom<br>• E-learning | | |
| 4 | Distance learning | | |

## 3. Contact Hours (based on the academic semester)

| No | Activity | Contact Hours |
|---|---|---|
| 1. | **Lectures** | 45 |
| 2. | **Laboratory/Studio** | 30 |
| 3. | **Field** | |
| 4. | **Tutorial** | |
| 5. | **Others (specify)** | |
| **Total** | | 75 |

## B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

| Code | Course Learning Outcomes | Code of PLOs aligned with the program | Teaching Strategies | Assessment Methods |
|---|---|---|---|---|
| **1.0** | **Knowledge and understanding** | | | |
| 1.1 | Introduce the main concepts of AM & FM communication systems | K2 | Lecture Discussion | Exam • Assignments • Quizzes |
| 1.2 | Explain the basic principles of electronic and digital communication system | K3 | Lecture Discussion | Exam • Assignments • Quizzes |
| … | Describe the types and principles of multiplexing and demultiplexing and principles of antennas and wave propagation. | K1 | Lecture Discussion | Exam • Assignments • Quizzes |
| **2.0** | **Skills** | | | |
| 2.1 | Calculate the bandwidth and signal-to-noise ratio of a signal at the output of a linear system or filter | S1 | Lecture • Discussion • Lab work • Brainstorming | Exam • Assignments • Quizzes t |
| 2.2 | Design a block-diagram of the transmitter and receiver for a basic | S2 | Lecture • Discussion • Lab work • Brainstorming | Exam • Assignments • Quizzes |

| Code | Course Learning Outcomes | Code of PLOs aligned with the program | Teaching Strategies | Assessment Methods |
|---|---|---|---|---|
| | digital communications system | | | |
| ... | Calculate the modulation index and percent of modulation for FM and AM communication systems | S3 | Lecture • Discussion • Lab work • Brainstorming | Exam • Assignments • Quizzes |
| **3.0** | **Values, autonomy, and responsibility** | | | |
| 3.1 | Work in a group to practice laboratory activities, delivers presentations | V2 | Discussion • Project | Assignments • Report |
| 3.2 | | | | |
| ... | | | | |

## C. Course Content

| No | List of Topics | Contact Hours |
|---|---|---|
| 1. | Introduction to Electronic Communication<br>-Communication system concepts<br>- Noise, bandwidth, gain, attenuation, and decibels<br>- Fundamentals of electronic RLC tuned circuit filters<br>- Communication applications. | 4 (Theory) 4x2 (Lab) |
| 2. | Modulation<br>- The need for modulation<br>- Amplitude modulation<br>- Pulse modulation<br>- Frequency modulation. | 4 (Theory) 4x2 (Lab) |
| 3. | Amplitude Modulator and Demodulator Circuits | 4 (Theory) 2x2 (Lab) |
| 4. | Fundamentals of Frequency Modulation | 4 (Theory) 2x2 (Lab) |
| 5. | FM Circuits | 4 (Theory) 4x2 (Lab) |
| 6. | Digital Communication Techniques | 4 (Theory) 4x2 (Lab) |
| 7. | Radio Transmitters | 4 (Theory) 4x2 (Lab) |

| | | |
|---|---|---|
| 8. | Communication Receivers | 4 (Theory) 4x2 (Lab) |
| 9. | Multiplexing and Demultiplexing | 4 (Theory) 4x2 (Lab) |
| 10 | Digital Data Transmission | 3 (Theory) 3 |
| Total | | 75 |

## D. Students Assessment Activities

| No | Assessment Activities * | Assessment timing (in week no) | Percentage of Total Assessment Score |
|---|---|---|---|
| 1. | First Monthly Exam | 8 | 20% |
| 2. | Year duties | continuously | 10% |
| 3. | Practical exam | 15 | 20% |
| 4. | Final exam | 18 | 50% |
| 5. | | | |

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

## E. Learning Resources and Facilities

### 1. References and Learning Resources

| | |
|---|---|
| Essential References | Frenzel, Louis. Principles of Electronic Communication System |
| Supportive References | S. Haykin, "Communication Systems", J. Wiley and Sons |
| Electronic Materials | Najran University E.Library<br>• Saudi Digital Library |
| Other Learning Materials | |

### 2. Required Facilities and equipment

| Items | Resources |
|---|---|
| **facilities**<br>(Classrooms, laboratories, exhibition rooms, simulation rooms, etc.) | Lecture rooms should be large enough to accommodate the number of registered students |
| **Technology equipment**<br>(projector, smart board, software) | Black Board/Data Show |
| **Other equipment**<br>(depending on the nature of the specialty) | |

## F. Assessment of Course Quality

| Assessment Areas/Issues | Assessor | Assessment Methods |
|---|---|---|
| Effectiveness of teaching | ***Student*** | ***Questioners*** |
| Effectiveness of Students assessment | Staff committee | Cross checking |
| Quality of learning resources | Faculty Administration | Review and check the results |
| The extent to which CLOs have been achieved | Quality management in the department | A review of the measurement of learning outcomes |
| Other | | |

**Assessors** (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

**Assessment Methods** (Direct, Indirect)

## G. Specification Approval

| | |
|---|---|
| **COUNCIL /COMMITTEE** | |
| **REFERENCE NO.** | |
| **DATE** | |