# CSE 3107
# Communication Engineering

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Zannatul Mifta

# Overview

- **Course Code**: CSE 3107
- **Course Title**: Communication Engineering
- **Credit Hour:** 3.0
- **Total Marks:** 100
- **Course Type**: Theory
- **Pre-requisite:** CSE 2207 (Computer Networks)
- **Year and Semester:** 3$^{rd}$ Year 1$^{st}$ Semester
- **Academic Session:** Summer 2025

# Instructor Details


- Name: Arifa Ferdousi
- Designation: Lecturer
- Department: Information and Communication Engineering
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- Cell Phone/WhatsApp: 01313328537

# Find your course materials in Teams

# Course Outcomes

| COs | Description | Taxonomy domain/level | POs | WK | WP | EA | Teaching-Learning strategy | Assessment strategy |
|---|---|---|---|---|---|---|---|---|
| CO1 | Describe the necessary terminologies of Communication Engineering. | Cognitive/ Understand | 1 | 3 | | | Lecture/Slides | Mid-Term |
| CO2 | Analyze the analog and the digital modulation techniques. | Cognitive/ Analyze | 2 | 4 | | | Lecture/Slides | Class Test |
| CO3 | Explain Satellite and Optical Fiber Communication | Cognitive/ Understand | 1 | 3 | | | Lecture/Slides | Final Exam |

# Program Outcomes

a) Apply knowledge of mathematics, natural science, engineering fundamentals and an engineering specialization as specified in K1 to K4 respectively to the solution of complex engineering problems.

b) Identify, formulate, research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences. (K1 to K4)

# Knowledge Profile (K1–K8)

| Code | Description |
|---|---|
| **WK1** | **Mathematics, science, engineering fundamentals** |
| **WK2** | **Engineering specialization fundamentals** |
| **WK3** | **Advanced engineering knowledge** |
| **WK4** | **Research literature and methods** |
| WK5 | Engineering design |
| WK6 | Engineering practices, tools, and resources |
| WK7 | Effects of engineering on society and environment |
| WK8 | Principles of project management and finance |

# Course Plan

| Week | Topic | Reading Materials |
|---|---|---|
| 1 | Communication Engineering Fundamentals, Waveforms Spectra, Elements of basic communication systems, Periodic and nonperiodic waveforms and their properties. Fourier series | • Data Communications and Networking by Behrouz A. Forouzan, Chapter-3<br>• Lecture Slides |
| | Noise and its different types. | • Lecture Slides<br>• Electronic Communication Systems by George Kennedy, Chapter-2 |
| 2 | Analogue Communication: Amplitude modulation, Amplitude modulation index, Frequency spectrum for sinusoidal AM. | • Lecture Slides<br>• Electronic Communication Systems by George Kennedy, Chapter-2 |
| 3 | Frequency Modulation: Frequency Modulation, Sinusoidal FM, Frequency spectrum for Sinusoidal FM, Phase Modulation. | • Class Lecture<br>• Lecture Slides<br>• Electronic Communication Systems by George Kennedy, Chapter-4 |
| 4 | Pulse Code Modulation (PCM), Quantization, Compression, PCM Receiver, Differential PCM | • Data Communications and Networking by Behrouz A. Forouzan, Chapter-4, Article - 4.2<br>• Lecture Slides |

# Course Plan

| Week | Topic | Reading Materials |
|---|---|---|
| 5 | Delta Modulation, Sigma-Delta A/D conversion. Pulse Modulation | • Data Communications and Networking by Behrouz A. Forouzan, Chapter-4, Article - 4.2.2<br>• Lecture Slides |
| 6 | Analog Multiplexing | • Data Communications and Networking by Behrouz A. Forouzan, Article-6.1 |
| 7 | Digital Communication: Basic Digital Communication System, Synchronization, Asynchronous Transmission,<br>Probability of Bit Error in Baseband Transmission, Matched Filter, Eye Diagrams | • Lecture Slides<br>• Data Communications and Networking by Behrouz A. Forouzan, Chapter-4<br>• Data Communications and Networking by Behrouz A. Forouzan, Chapter-3 |
| 8 | Digital Carrier Systems, Amplitude Shift keying,<br>Frequency Shift Keying, Phase Shift Keying | • Data Communications and Networking by Behrouz A. Forouzan, Article-5.1 |

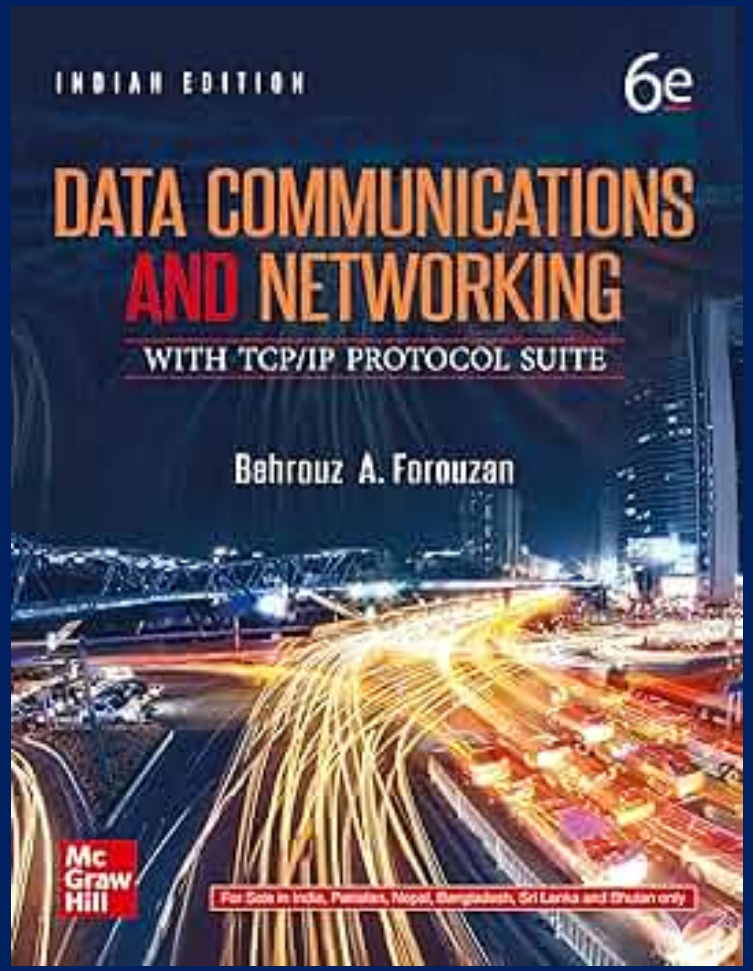
# Course Plan

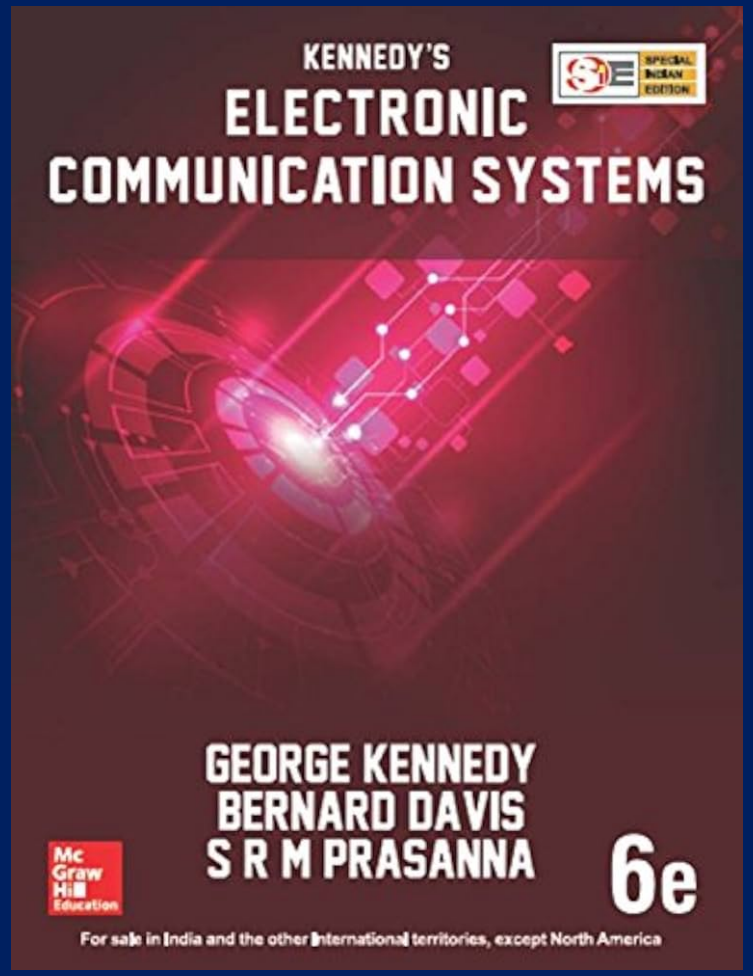
| Week | Topic | Reading Materials |
|---|---|---|
| 9 | Carrier Recovery Circuits<br>Quadrature Phase Shift Keying, | • Class Lecture<br>• Data Communications and Networking by Behrouz A. Forouzan, Article-5.1 |
| 10 | Error Control Coding, Block Control,<br>Repetition Encoding, Parity Encoding, | • Class Lecture<br>• Lecture Slides |
| 11 | Convolution Encoding.<br>Digital Multiplexing. | • Lecture Slides<br>• Data Communications and Networking by Behrouz A. Forouzan |
| 12 | Satellite Communication, Kepler's First and Second Law, Orbits, Geostationary Orbits | • Lecture Slides<br>• Data Communications and Networking by Behrouz A. Forouzan, Chapter-16 |

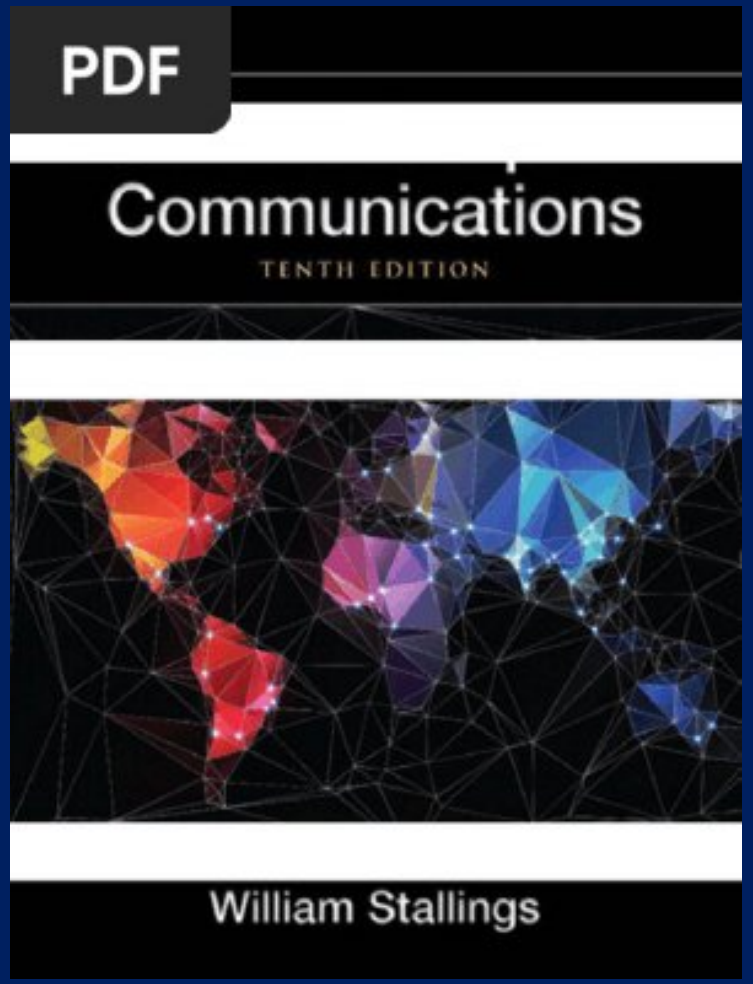
# Course Plan

| Week | Topic | Reading Materials |
|---|---|---|
| 13 | Power System. 5G technologies. Fiber Optic Communication, Propagation within a Fiber, | • Lecture Slides<br>• Data Communications and Networking by Behrouz A. Forouzan, Chapter-7 |
| 14 | Modes of Propagation, Losses in Fibers, Light sources for Fiber optics, Photo detectors. | • Lecture Slides<br>• Data Communications and Networking by Behrouz A. Forouzan, Chapter-7 |

# Reference Books:



# Assessment Tools

| Assessment Tools | | Marks (%) | |
|---|---|---|---|
| Continuous Assessment (CA) | Class Participation | 10% | 40% |
| | Class Test, Presentation | 30% | |
| Summative Assessment (SA) | Mid-term Examination | 24% | 60% |
| | Final Examination | 36% | |
| | **Total** | **100%** | |

# Teaching Learning Method

| COs | Teaching-Learning strategy | Assessment strategy |
|---|---|---|
| CO1 | Lectures, Power Point Slide, Book | Class Test |
| CO2 | Lecture Slides, Interactive Discussion, Assignments | Mid-term exam |
| CO3 | Lectures Slides, Hands on class work, Interactive Discussion | Final Exam |

# Course Conducting/Course Policies:

- It is the student's responsibility to gather information about the assignments and covered topics if he/she does miss the lecture.
- Regular class attendance is mandatory. Points will be taken off for missing classes.
- Without **50% of** attendance, sitting for the final exam is **NOT allowed**.

# Course Conducting/Course Policies:

- The students must enter the **classroom in time** to get the attendance. **No student** will be allowed to enter the classroom after the attendance has been done.

# Course Conducting/Course Policies:

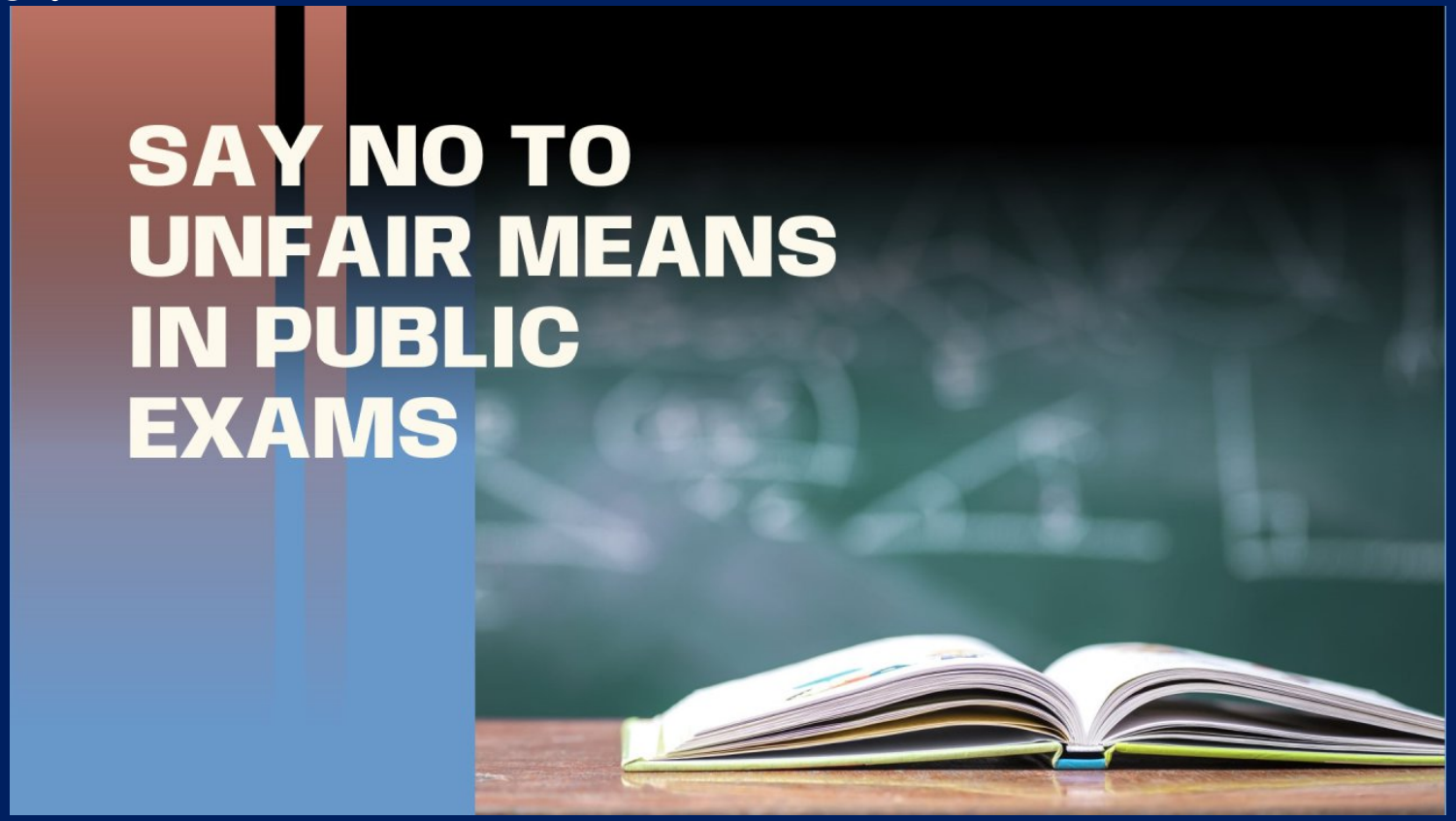
- Once the attendance is done, a student can leave the class if he or she thinks that he or she is not getting benefits from the class
- The reading materials for each class will be available at the **above-given link** before that class.

# Course Conducting/Course Policies:

- Each student will have to present an oral presentation **for 5 minutes** on Communication Engineering related recent developments, topics or technologies.
- It is expected that the student will also provide some new knowledge related to the curriculum and then make the class a **place of knowledge sharing among all participants, both teachers and students**.

# Course Conducting/Course Policies:

Any attempt at **unfair means** in the examination is **strictly prohibited**.



# Course Conducting/Course Policies:

- The date and syllabus of quiz/class test will be announced in time in Microsoft Team
- Students will be **notified** in due time for class cancelation, extra class, make-up class and tutorial class.

# Course Conducting/Course Policies:

Students are encouraged to participate in the class discussion and to **ask questions**. The student can ask any question without hesitation as long as they cannot understand the topics being discussed. Please keep in mind that if you don’t understand, it’s not your fault; it’s my limitation that I couldn't make you understand. The class is expected to be **interactive.**