

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

| COURSE OUTLINE | | | |
|--|--|------------------------------|----|
| Course Title | | Communication Systems | |
| Course Code | EEPC27 | No. of Credits | 03 |
| Department | EEE-4 th Year, Section A and B | Course Type | PC |
| Faculty | | Dr. S. S. Karthikeyan | |
| Pre-requisites Course Code | | EEPC15, EEPC19 | |
| Course Coordinator(s) (if, applicable) | | - | |
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| Teacher(s)/Tutor(s) E-mail | | | |

| COURSE OVERVIEW |
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| <p>This course covers the fundamental concepts of communication systems, especially focusing on various aspects of analog and digital communication systems. The major part of the course will be focused on the basic understanding of various modulation and demodulation techniques used in communication transmitter and receiver. The use of error correction and correction codes will be discussed in details.</p> <p>Syllabus: Basic blocks of Communication System. Analog Modulation - Principles of Amplitude Modulation, DSBSC, SSB-SC and VSB-SC. AM transmitters and receivers.</p> <p>Angle Modulation - Frequency and Phase Modulation. Transmission Bandwidth of FM signals, Methods of generation and detection. FM Transmitters and Receivers.</p> <p>Sampling theorem - Pulse Modulation Techniques - PAM, PWM and PPM concepts - PCM system - Data transmission using analog carriers (BASK, BFSK, BPSK, QPSK).</p> <p>Error control coding techniques – Linear block codes- Encoder and decoder. Cyclic codes – Encoder, Syndrome Calculator. Convolution codes.</p> <p>Modern Communication Systems – Microwave communication systems - Optical communication system - Satellite communication system - Mobile communication system.</p> |
| COURSE OBJECTIVES |
| <ul style="list-style-type: none"> <input type="checkbox"/> To develop a fundamental understanding on communication systems with emphasis on analog and digital modulation techniques. <input type="checkbox"/> To get introduced to the basics of error control coding techniques. |
| COURSE OUTCOMES (CO) |

CO 1: Understand the basics of communication system, analog and digital modulation techniques.
 CO 2: Apply the knowledge of digital electronics and understand the error control coding techniques.
 CO 3: Summarize different types of communication systems and its requirements.

| PO | CO1 | CO2 | CO3 |
|----|-----|-----|-----|
| 1 | H | H | H |
| 2 | H | M | M |
| 3 | H | M | M |
| 4 | L | L | L |
| 5 | L | L | L |
| 6 | M | H | M |
| 7 | M | M | M |
| 8 | M | M | M |
| 9 | H | H | H |
| 10 | H | H | H |
| 11 | M | M | M |
| 12 | H | M | M |
| 13 | H | H | H |
| 14 | M | M | M |

COURSE TEACHING AND LEARNING ACTIVITIES

| S.No. | Weeks | Tentative Scheduled Topics | Mode of Delivery |
|-------|-----------------------|---|---|
| 1. | 1st Week | Basic blocks of Communication System. Analog Modulation | C&T, PPT, peer learning, (any suitable model) |
| 2. | 2 nd Week | Principles of Amplitude Modulation, DSBSC | |
| 3. | 3 rd Week | SSB-SC and VSB-SC. AM transmitters and receivers. | |
| 4. | 4 th Week | Angle Modulation - Frequency and Phase Modulation. Transmission Bandwidth of FM signals | |
| 5. | 5 th Week | Methods of generation and detection. | |
| 6 | 6 th Week | FM Transmitters and Receivers. | |
| 7 | 7 th Week | Sampling theorem - Pulse Modulation Techniques - PAM, PWM and PPM concepts | |
| 8 | 8 th Week | PCM system – Data transmission using analog carriers | |
| 9 | 9 th Week | BASK, BFSK, BPSK, QPSK | |
| 10 | 10 th Week | Error control coding techniques – Linear block codes | |
| 11 | 11 th Week | Cyclic codes – Encoder, Syndrome Calculator | |
| 12 | 12 th Week | Convolution codes | |
| 13 | 13 th Week | Modern Communication Systems – Microwave communication systems - Optical communication | |
| 14 | 14 th Week | Satellite communication system - Mobile communication system | |

COURSE ASSESSMENT METHODS

| S.No. | Assessment | Week/Date | Duration | Weightage (%) |
|-------|----------------------|---------------------------------|-------------|---------------|
| 1 | Quiz I | 4 th Week of Aug '18 | 60 Minutes | 20 |
| 2 | Quiz II | 4 th Week of Sep '18 | 60 Minutes | 20 |
| 3 | Assignment | NA | NA | 10 |
| 4 | End Sem. Examination | 2 nd Week of Nov '18 | 180 Minutes | 50 |

Text Books

1. Simon Haykins, 'Communication Systems', John Wiley, 3rd Edition, 1995.

2. D.Roddy & J.Coolen, 'Electronic Communications', Prentice Hall of India, 4th Edition, 1999.

3. Kennedy G, 'Electronic Communication System', McGraw Hill, 1987.

Reference Books

1. Shulin Daniel, 'Error Control Coding', Pearson, 2nd Edition, 2011.

2. B.P. Lathi and Zhi Ding, 'Modern Digital and Analog Communication Systems', OUP USA Publications, 4th Edition, 2009.

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)

Feedback from the students during class committee meetings.

Anonymous feedback through questionnaire.

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

CORRESPONDENCE

1. All the students are advised to check their NITT WEBMAIL regularly. All the correspondence (schedule of classes/ schedule of assessment/ course material/ any other information regarding this course) will be intimated in Class Only.

ATTENDANCE

1. Attendance will be taken by the faculty in all the contact hours. Every student should maintain minimum 70 % physical attendance in these contact hours along with assessment criteria to attend the end semester examination.

2. Students not having 70% minimum attendance at the end of the semester will have to RE DO the course.

ASSESSMENT

1. Attending all the assessments are MANDATORY for every student.

2. If any student is not able to attend any of the Assessments due to genuine reason, student is permitted to attend the Repeat assessment (RA) with Corresponding weightage.

3. Student who fails to score 60% in RA will take up additional assignments to get eligibility for writing End Semester examination.

4. Finally, every student is expected to score minimum 1/3rd of the top rank holder of the class(Including all the assessments) to pass the course. Otherwise the student would be declared fail and 'F' grade will be awarded. Further he can take up only FORMATIVEASSESSMENT.

5. Please refer B.Tech Regulations 2015(B.12.1) for the letter grades and the corresponding grades.

For Approval



Course Faculty
(Dr. S. S. Karthikeyan)


20/08/2018

CC Chairperson


20/8/18

HOD/EEE