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Description generated with very high confidence

**Course Plan**

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| **Department :** | ELECTRONICS AND COMMUNICATION |
| **Course Name & code :** | ANALOG AND DIGITAL COMMUNICATION & ECE3151 |
| **Semester & branch :** | V & ECE |
| **Name of the faculty :** | PMP, RMD, AV |
| **No of contact hours/week:** | |  |  |  |  | | --- | --- | --- | --- | | **L** | **T** | **P** | **C** | | 3 | 1 | 0 | 4 | |

**Course Outcomes (COs)**

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|  | ***At the end of this course, the student should be able to:*** | **No. of Contact Hours** | **Marks** |
| CO1: | Discuss various modulation schemes of Analog Communication | Hrs. | Marks |
| CO2: | Explain various baseband modulation schemes and ISI of Digital Communication | Hrs. | Marks |
| CO3: | Explain Detection and estimation and effect of noise in communication | Hrs. | Marks |
| CO4: | Explain various passband modulation schemes of Digital Communication | Hrs. | Marks |
| CO5: | Describe mathematical theory of communication. | Hrs. | Marks |
|  | **Total** |  |  |

**Assessment Plan**

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| **Components** | **Assignments** | **Sessional Tests** | **End Semester/**  **Make-up Examination** |
| **Duration** | 20 to 30 minutes | 60 minutes | 180 minutes |
| **Weightage** | 20 % (4 X 5 marks) | 30 % (2 X 15 Marks) | 50 % (1 X 50 Marks) |
| **Typology of Questions** | Understanding/ Comprehension; Application; Analysis; Synthesis; Evaluation | Knowledge/ Recall; Understanding/ Comprehension; Application | Understanding/ Comprehension; Application; Analysis; Synthesis; Evaluation |
| **Pattern** | Answer one randomly selected question from the problem sheet (Students can refer their class notes) | MCQ: 10 questions (0.5 marks)  Short Answers: 5 questions (2 marks) | Answer all 5 full questions of 10 marks each. Each question may have 2 to 3 parts of 3/4/5/6/7 marks |
| **Schedule** | 4, 7, 10, and 13th week of academic calendar | Calendared activity | Calendared activity |
| **Topics Covered** | Quiz 1 (L **x1-x2**& T **y1-y2**) **(CO x)** | Test 1  (L **a1-a2**& T **b1-b2**)  **(CO x)** | Comprehensive examination covering full syllabus. Students are expected to answer all questions **(CO1-5)** |
| Quiz 2 (L **x3-x4**& T **y3-y4**) **(CO x)** |
| Quiz 3 (L **x5-x6**& T **y5-y6**) **(CO x)** | Test 2  (L **a3-a4**& T **b3-b4**)  **(CO x)** |
| Quiz 4 (L **x7-x8**& T **y7-y8**) **(CO x)** |

**Lesson Plan**

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| **L. No.** | **Topics** | **Course Outcome Addressed** |
| **L0** | Overview of Fourier series and transform and properties | CO |
| **L1** | Spectral densities and Correlation of energy and power signals | CO |
| **L2** | Spectral densities and Correlation of energy and power signals, properties | CO |
| **T1** | Tutorial | CO |
| **L3** | Amplitude modulation (AM), time domain and and frequency domain analysis, generation of AM | CO |
| **L4** | AM Detection | CO |
| **L5** | DSBSC modulation and dsetection, Quadrature Carrier Carrier Multiplexing | CO |
| **T2** | Tutorials | CO |
| **L6** | Single Sideband modulation, Frequency domain and timedomain analysis | CO |
| **L7** | SSB detection, and Qualitative analysis of VSB | CO |
| **L8** | Angle Modulation, FM, spectral analysis,NBFM, WBFM, and generation of FM | CO |
| **T3** | Tutorials | CO |
| **L9** | Genaration of FM(Armstrong method), Demodulation of FM wave | CO |
| **L10** | Demodulation of FM wave | CO |
| **L11** | Numericals | CO |
| **T4** | Tutorials | CO |
| **L12** | Detection and Estimation | CO |
| **L13** | Gram-schmidt orthogonalisation | CO |
| **L14** | Numericals, Geometric interpretation of signals, Bank of correlators | CO |
| **T5** | Tutorials | CO |
| **L15** | Detection of known signals in noise, probability of error, correlation receiver | CO |
| **L16** | Matched filter receiver, Maximization of SNR and properties | CO |
| **L17** | Pulse code modulation (PCM), Quantizing | CO |
| **T6** | Tutorials | CO |
| **L18** | Sources of noise in PCM | CO |
| **L19** | Robust quantization | CO |
| **L20** | DPCM, Delta Modulation(DM) | CO |
| **T7** | Tutorials | CO |
| **L21** | Discrete PAM signals and their power spectra | CO |
| **L22** | Nyquist Criterion for distrtionless baseband binary transmission | CO |
| **L23** | Ideal and Practical solution | CO |
| **T8** | Tutorials | CO |
| **L24** | Correlative coding and eye pattern | CO |
| **L25** | Numericals | CO |
| **L26** | Introduction to Digital Communication, coherent BPSK, BER analysis | CO |
| **T9** | Tutorials | CO |
| **L27** | BFSK, BER analysis, | CO |
| **L28** | Quadriphase shift keying and BER analysis | CO |
| **L29** | Some Noncoherent modulation schemes, Comparison of various modulation schemes | CO |
| **T10** | Tutorials | CO |
| **L30** | Introduction to Information Theory, Source entropy and properties | CO |
| **L31** | Source coding, Huffman code | CO |
| **L32** | Discrete memoryless channels, Binary Symmetric Channel(BSC) Mutual information | CO |
| **T11** | Tutorials | CO |
| **L33** | Properties of Mutual information and numericals | CO |
| **L34** | Channel Capacity | CO |
| **L35** | Channel Coding Theorem | CO |
| **T12** | Tutorials | CO |
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**References:**

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| 1. | Haykin S., An Introduction to Analog and Digital Communications, Wiley, 2008 |
| 2. | Haykin S., Digital Communications, Wiley, 2008 |
| 3. | Roddy D. and Coolen J., Electronic Communications, PHI, 2001. |
| 4. | Lathi B. P., Modern Digital and Analog Communication, Oxford University Press, 2005. |
| 5. | Ziemer R.E. and Tranter W.H, Principles of Communications (5e), Wiley India. |
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| **Submitted by:** | Click or tap here to enter text. |

**(Signature of the faculty)**

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| **Date:** | Click or tap to enter a date. |

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| **Approved by:** | Click or tap here to enter text. |

**(Signature of HOD)**

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| **Date:** | Click or tap to enter a date. |

**Faculty members teaching the course (IF MULTIPLE sections EXIST):**

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| --- | --- | --- | --- |
| **FACULTY** | **Section** | **FACULTY** | **Section** |
| PRASHANT M PRABHU | A AND D | DR RAJIV MOHAN DAVID | B |
| APARNA V | C |  |  |
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