***Lesson Plan***

 ***Prof.Jagruti Nagaonkar***

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| CLASS | TE Electronics, Semester V |
| Academic Term  | July – Nov 2020 |
| Subject | **Digital Communication (ELX 502)** |
| ***Periods (Hours) per week*** | ***Lecture*** | ***4*** |
| ***Practical*** | ***4*** |
| ***Tutorial*** | ***--*** |
| ***Evaluation System*** |  | ***Hours*** | ***Marks*** |
| Theory examination | 3 | 80 |
| Internal Assessment | -- | 20 |
| Practical Examination | -- | -- |
| Oral Examination | -- |  |
| Term work | -- |  |
| Total | -- | 100 |
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| ***Time Table*** | ***Day*** | ***Time*** |
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| ***Course Content and Lesson plan*** |
| ***Module 1: Information theory and source coding*** |
| **Week** | **Lecture No.** | **Date** | **Topic** | **Remarks****(If any)** | **Mapped CO** | **Mapped PO** |
| **Planned** | **Actual** |
| 1 | 1 |  |  | Introduction of Digital communication with block diagram and other parameters |  |  ELX 502.2 | PO1,PO2 |
| 2 |  |  | Concept of information and entropy(H) |  | ELX 502.2 | PO1,PO2 |
| 3 |  |  | Examples based on H and Shannon Fano theorem for source coding |  | ELX 502.2.2 | PO1,PO2 |
| 4 |  |  | Shanon Fano coding examples, Huffman coding examples |  | ELX 502.2 | PO1,PO2 |
| 5 |  |  | Proof on channel capacity parameters, Bandwidth S/N trade off | QUIZ1 | ELX 502.2 | PO1,PO2 |
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| ***Module 2:* *Digital Modulation Techniques*** |
|  | 6 |  |  | coherent and non- coherent reception BPSK modulation and demodulation , PSD and constellation diagram |  | ELX 502.1 | PO1,PO5 |
|  | 7 |  |  | DPSK modulation and demodulation, DEPSK |  | ELX 502.1 | PO1 |
|  | 8 |  |  | QPSK transmitter, QPSK receiver,offset and nonoffset QPSK |  | ELX 502.1 | PO1,PO2 |
|  | 9 |  |  | Mary PSK |  | ELX 502.1 | PO1,PO2 |
|  | 10 |  |  | FSK and Mary FSK , QAM |  | ELX 502.1 | PO1,PO2 |
|  | 11 |  |  | MSK modulator, waveforms **,** MSK constellation diagram, phase continuity, MSK demodulator |  | ELX 502.1 | PO1,PO2 |
|  | 12 |  |  | Comparison of all techniques based on spectral efficiency, power efficiency. Probability of error in detection  |  | ELX 502.1 | PO1,PO2 |
|  | 13 |  |  | A baseband signal receiver and its Probability of error |  | ELX 502.1 | PO1,PO2 |
|  | 14 |  |  | Optimum receiver and its transfer function, matched filter and its properties | **QUIZ2** | ELX 502.1 | PO1,PO2 |
| ***Module 3:* *Introduction to Digital communication system*** | 15 |
|  | 15 |  |  | Random variables, Mean and variance of random variables (R.V.), Numericals based on R.V |  | ELX 502.2 | PO1 |
|  | 16 |  |  | Binomial distribution, Poisson distribution, Gaussian PDF, Rician PDF |  | ELX 502.2 | PO1 |
|  | 17 |  |  | Central limit theorem, Binary synchronous channel.Optimal receiver |  | ELX 502.2 | PO1 |
| ***Module 4:Error Control Codes*** |
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| ***Module 5:Pulse Shaping for Optimum Transmission*** |
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| ***Module 6 :Application of Digital Communication*** |
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**Text- Books:**

1. Simon Haykin, “*Communication System*”, John Wiley And Sons ,4th Ed
2. Taub Schilling And Saha, “*Principles Of Communication Systems*”, Tata Mc-Graw Hill, Third Ed
3. John G. Proakis, “*Digital Communications*”, Mcgraw Hill , 5th Ed
4. Anil Maini and Varsha Agarwal,”Satellite Communication”,Wiley publication

**Internal Assessment:**

Two tests will be conducted which will cover at least 80% of syllabus.

The average marks of both the tests will be considered as final IA marks

**Semester End Theory Examination**:

1.      Question paper will comprise of total 6 questions, each of 20 marks.

2.      Only 4 questions need to be solved.

3.      Question number 1 will be compulsory and will cover all modules whereas sub questions

 of 2 to 5 marks will be asked

4.      Remaining questions will be asked from all the modules

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| **Submitted By**  | **Approved By** |
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| Prof. Jagruti Nagaonkar | ii) Prof. K. Narayanan Sign: |
|  |  |
| Sign: | ii) Prof. Sapna Prabhu Sign: |
|  |  |
|   | iii) Prof. Shilpa PatiL Sign: |
|  | iv) Prof. Monica Khanore Sign: |
|  |  |
| **Date of Submission:** | **Date of Approval:** |
|  |
| **Remarks by PAC (if any)** |
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