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**EC5.102 Information and Communication 3-1-0-4**

**Faculty Name :** Prasad Krishnan

**TYPE-WHEN** : Spring

**PRE-REQUISITE**  : None

**OBJECTIVE**  : The course provides a broad overview of important principles involved in the design of information systems, the details of which will be learnt in later courses of the curriculum. Relevant mathematical background required (for instance, working knowledge of probability) will be covered within the course.

**COURSE TOPICS :** - Acquisition Signals, Examples of analog and digital signals, Sampling theorem, Quantization, A/D conversion and D/A conversion

**- Compression**

Sources of information, Information measure, Entropy, Representing sources as bit sequences, Source codes

**- Communication**

a. Communication Resources – Power, Bandwidth, Baseband signals, Bandpass signals

b. Modulation – Analog Modulation, Digital Modulation (BPSK,QAM)

c. Noise, Types of channels – Wireline channel, Wireless channel, Other examples (Optical etc)

d. Probability of error, Hypothesis testing

e. Channel Capacity, Introduction to error correcting codes

f. Transmitter and receiver block diagram, RF Front end, Synchronization, Receiver Imperfections

g. Upper layers in the OSI model – MAC, Transport, Multiple access schemes and Routing

**- Security**

Introduction to Cryptography

**- Systems**

Examples of Communication Systems – Cellular Systems, Sensor Networks

**PREFERRED TEXT BOOKS:**

Course Notes (including problems) will be provided well in advance.

**COURSE ASSESSMENT PLAN:**

|  |  |
| --- | --- |
| Type of Evaluation | Weightage (in %) |
| Quiz 1,2,3 (best 2 of 3) | 20% x 2 = 40% |
| Final Quiz | 30% |
| Course Summaries | 15% |
| Project | 15% |

**OUTCOME**: A high level understanding of various aspects of information systemsand helps in developing a perspective of what to expect from various courses which are part of ECE curriculum down the line.