CT111 Basic Telecommunication

Instructor: Prof. Sanjeev Gupta

1. Title: Basic Telecommunication (BTC)

2. Credit Structure (L-T-P-Cr) : 3-0-4-5

3. Course Number: CT111

4. Slot: 2nd Semester

5. Category: Foundation (Core) Course

6. Prerequisite: Basic Electronic Circuits

7. Foundation for: Analog and Digital Communication and other advanced Communication Group Courses

8. Abstract:

9. Suggested Text/s:

10. Other References:

10. Detailed Contents:

<table>
<thead>
<tr>
<th>Topic Name</th>
<th>Content (2-3 lines per 4-6 lectures)</th>
<th>No of lectures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to Antennas and Transmission Lines</td>
<td>Transmission line Fundamentals, Types of Transmission Lines, Antenna Fundamentals, Basic Antenna Operation, Isotropic Radiator, Basic Antennas.</td>
<td>5</td>
</tr>
<tr>
<td>The Basic Telephone System</td>
<td>Basic Telephone System, Numbering and Dialling, Switching and Types of Switching, Telephone Line (local loop) signalling, Local Exchange and its organisation.</td>
<td>4</td>
</tr>
<tr>
<td>Introduction to Optical Fibre Communication</td>
<td>Optical Fibre versus Metallic Cable, Types of Optical Fibres, Propagation of Light through Optical Fibre, Fibre Attenuation and Dispersion, Optical Transmitters and Receivers, Optical Fibre Communication System, Applications, Advantages and Limitations.</td>
<td>4</td>
</tr>
<tr>
<td>Introduction to Satellite Communication</td>
<td>Satellite Orbits, Geostationary Satellites, Satellite Communication Systems, Satellite System Link Models (Up-Link and Down-Link), Transponder, Earth Stations, Applications Overview.</td>
<td>4</td>
</tr>
</tbody>
</table>
11. Outcomes and Objectives:
The objective of this course is to –

- Appreciate what a telecommunication system is, why it is required and its fundamental concepts.
- Know some of different types of basic blocks used in a telecommunication system.
- Perform experiments with some of the basic sub-systems used for telecommunication, measure some of the parameters and validate various concepts.
- Simulate certain components of a telecommunication system and observe some of the relevant parameters using Scilab.
- Know details of the telecommunication systems like the telephone, optical fibre communication, wireless and mobile communication, and satellite communication systems.

Outcome: At the end of the course, the student should be able to –

- understand the basic principles of telecommunication.
- articulate the basic blocks of a typical communication system.
- identify the most common types of transmission media.
- appreciate and becomes familiar with various modern communication systems.
- learn the concepts of telecommunication through experimentation and use of modern engineering tools (like Scilab).

12. Evaluation (tentative):
1st In-Semester Examination: 20%
2nd In-Semester Examination: 20%
Labs: 10%
Final Examination: 50%

Total marks out of 100 will be converted to a letter (performance) grade using a 10-point scale.