

**SARDAR PATEL UNIVERSITY**  
**Syllabus Structure B.Sc. Semester: VI**  
**With Effect from: June – 2025**  
**Bachelor of Science**  
**B.Sc. Electronics and Communication Semester VI**  
**(Major subject)**

| Course Code                                                                        | US06MAELC01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Title of the Course | Digital Communication System |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|------------------------------|
| Total Credits of the Course                                                        | 04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Hours per Week      | 04                           |
| Programme Outcome (PO) - For B.Sc. Electronics and Communication Programme         | <ol style="list-style-type: none"> <li>1. Bachelor of Science degree program provides theoretical and practical knowledge of different Science subjects in consonance with National Education Policy 2020.</li> <li>2. This programme provides a flexibility to students to acquire certificate course, diploma course, degree programme, honours degree with or without research having multi entry and multi exit facilities.</li> <li>3. Bachelor of Science programme at Sardar Patel University is designed keeping the overall back ground preparation in mind for the student to either opt for a Master programme or jobs or to become an entrepreneur.</li> <li>4. At the entry level of the programme, i.e., semester one, various subjects offered as major subject, minor subject, interdisciplinary subject as per choice of the students.</li> <li>5. In addition to that, some skill enhancement courses, ability enhancement courses and value-added courses are also offered for overall development of the students.</li> <li>6. After end of the even semesters, the students may take exit after fulfilling the minimum requirements.</li> <li>7. The students have the enough opportunity to complete four-year graduation programme with any major subject as per their choice.</li> <li>8. The students, after completion of the program from Sardar Patel University, can opt for the master's degree programme in the subject they have had at the final semester, or in a related discipline.</li> </ol> |                     |                              |
| Programme Specific Outcome (PSO) – B.Sc. (Electronics and Communication) Programme | <ol style="list-style-type: none"> <li>1. To improve the scientific awareness among the students.</li> <li>2. To make students to understand the role and contribution of Electronics and Communication in the development of science and technology.</li> <li>3. To improve scientific attitude and to give emphasis on the development of experimental skills, data analysis, calculations, and also on the limitations of the experimental method and data as well as results obtained.</li> <li>4. To help students in understanding the concepts of Electronics and Communication.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                              |



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|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
|                               | <div>5. To emphasize the strength of equations, formulae, graphs, mathematical tools to solve the problems.</div> <div>6. To understand the conceptual development of the subject and thereby develop the interest in the subject.</div> <div>7. To create interest in the subject and improve technological aspect through mini projects, projects, models, demonstrations, etc.</div> <div>8. To create interest in the subject to continue to work in the field of science particularly in Electronics and Communication.</div> <div>9. To Understand the impact of electronics in modern era.</div> |                |
| Course Objectives:            | <div>1. In this course, students will be learning about the electronics instrument which were used in our day to-day life.</div> <div>2. To understand the basics of semiconductor components like resistor, capacitor and inductor their applications will be introduced.</div>                                                                                                                                                                                                                                                                                                                        |                |
| Course Content                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |
| Unit                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Weightage* (%) |
| 1.                            | <b>Sampling</b> : Introduction, The sampling Theorem, proof of sampling theorem, Nyquist rate, Reconstruction filter, <b>Signal reconstruction</b> : The Interpolation Formula, Effect of under sampling, sampling techniques, comparison of various sampling technique                                                                                                                                                                                                                                                                                                                                 | 25%            |
| 2.                            | <b>Pulse Modulation</b> : Pulse Modulation, Analog Pulse Modulation, Pulse Amplitude Modulation, generation and Detection of PAM, Pulse Time Modulation, Pulse Width Modulation, generation and Detection of PWM Signal, Pulse Position Modulation, Generation and Detection of PPM Signal, Pulse code Modulation,                                                                                                                                                                                                                                                                                      | 25%            |
| 3                             | <b>Digital Modulation Techniques</b> : Introduction, Digital modulation Format, types of digital modulation techniques, Coherent Binary ASK, Binary phase shift keying, coherent Binary Frequency shift keying, Non coherent Binary modulation techniques                                                                                                                                                                                                                                                                                                                                               | 25%            |
| 4                             | <b>Antenna</b> : Basic antenna parameters, radiation intensity, directivity and gain, directional properties of dipole antenna, antenna aperture, effective area, effective height, antenna terminal impedance, transmission loss between antennas, antenna temperature & S/N ratio, space communication.                                                                                                                                                                                                                                                                                               | 25%            |
| Teaching-Learning Methodology | <div>Direct Teaching through Chalk-Walk and Talk</div> <div>ICT enabled teaching</div> <div>Question-Answer</div> <div>Class discussion led by teacher/students</div> <div>Case Studies</div> <div>Literature review</div> <div>Problem solving activities</div>                                                                                                                                                                                                                                                                                                                                        |                |



|                                                                                                                                                                                                                                                                            | Debate<br>Collaborative and Co-operative Learning<br>Think Pair Share<br>Jigsaw<br>Inquiry Based Learning<br>Panel Discussion<br>Project Based Learning<br>Flipped Classroom<br>Blended Learning designs<br>Concept Mapping |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <b>Evaluation Pattern</b>                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                             |                  |
| <b>Sr. No.</b>                                                                                                                                                                                                                                                             | <b>Details of the Evaluation</b>                                                                                                                                                                                            | <b>Weightage</b> |
| 1.                                                                                                                                                                                                                                                                         | Internal Written / Practical Examination Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)                                                        | 50%              |
| 2.                                                                                                                                                                                                                                                                         | University Examination                                                                                                                                                                                                      | 50%              |
| Course Outcomes: On the successful completion of the course, the students should be able to apply their knowledge to solve problems, analyze complex issues, design solutions, conduct investigations, and understand the societal and ethical implications of their work. |                                                                                                                                                                                                                             |                  |
| <b>Suggested References:</b>                                                                                                                                                                                                                                               |                                                                                                                                                                                                                             |                  |
| <b>Sr. No.</b>                                                                                                                                                                                                                                                             | <b>References</b>                                                                                                                                                                                                           |                  |
| 1.                                                                                                                                                                                                                                                                         | Electronic Communication System – Blake (Thomson and Delmar)                                                                                                                                                                |                  |
| 2.                                                                                                                                                                                                                                                                         | Electronic Communication System – Fundamental through Advance – Wayne Tomasi (Pearson Education Asia)                                                                                                                       |                  |
| 3.                                                                                                                                                                                                                                                                         | Antennas – J.D.Krauss (McGraw Hill)                                                                                                                                                                                         |                  |
| On-line resources to be used if available as reference material                                                                                                                                                                                                            |                                                                                                                                                                                                                             |                  |
| On-line Resources:                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                             |                  |
| <a href="https://www.electronics-tutorials.ws/">https://www.electronics-tutorials.ws/</a><br><a href="https://www.electronicshub.org/tutorials/">https://www.electronicshub.org/tutorials/</a><br><a href="http://www.allaboutcircuits.com">www.allaboutcircuits.com</a>   |                                                                                                                                                                                                                             |                  |

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**Syllabus Structure B.Sc. Semester: VI**  
**With Effect from: June – 2025**  
**Bachelor of Science**  
**B.Sc. Electronics and Communication Semester VI**  
**(Major subject)**

| Course Code                                                                        | US06MAELC02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Title of the Course | Electronics Measuring Instruments |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------------------------------|
| Total Credits of the Course                                                        | 04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Hours per Week      | 04                                |
| Programme Outcome (PO) - For B.Sc. Electronics and Communication Programme         | <ol style="list-style-type: none"> <li>1. Bachelor of Science degree program provides theoretical and practical knowledge of different Science subjects in consonance with National Education Policy 2020.</li> <li>2. This programme provides a flexibility to students to acquire certificate course, diploma course, degree programme, honours degree with or without research having multi entry and multi exit facilities.</li> <li>3. Bachelor of Science programme at Sardar Patel University is designed keeping the overall back ground preparation in mind for the student to either opt for a Master programme or jobs or to become an entrepreneur.</li> <li>4. At the entry level of the programme, i.e., semester one, various subjects offered as major subject, minor subject, interdisciplinary subject as per choice of the students.</li> <li>5. In addition to that, some skill enhancement courses, ability enhancement courses and value-added courses are also offered for overall development of the students.</li> <li>6. After end of the even semesters, the students may take exit after fulfilling the minimum requirements.</li> <li>7. The students have the enough opportunity to complete four-year graduation programme with any major subject as per their choice.</li> <li>8. The students, after completion of the program from Sardar Patel University, can opt for the master's degree programme in the subject they have had at the final semester, or in a related discipline.</li> </ol> |                     |                                   |
| Programme Specific Outcome (PSO) – B.Sc. (Electronics and Communication) Programme | <ol style="list-style-type: none"> <li>1. To improve the scientific awareness among the students.</li> <li>2. To make students to understand the role and contribution of Electronics and Communication in the development of science and technology.</li> <li>3. To improve scientific attitude and to give emphasis on the development of experimental skills, data analysis, calculations, and also on the limitations of the experimental method and data as well as results obtained.</li> <li>4. To help students in understanding the concepts of Electronics and Communication.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                   |



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|                               | <div>5. To emphasize the strength of equations, formulae, graphs, mathematical tools to solve the problems.</div> <div>6. To understand the conceptual development of the subject and thereby develop the interest in the subject.</div> <div>7. To create interest in the subject and improve technological aspect through mini projects, projects, models, demonstrations, etc.</div> <div>8. To create interest in the subject to continue to work in the field of science particularly in Electronics and Communication.</div> <div>9. To Understand the impact of electronics in modern era.</div> |                |
| Course Objectives:            | <div>1. In this course, students will be learning about the electronics instrument which were used in our day to-day life.</div> <div>2. To understand the basics of semiconductor components like resistor, capacitor and inductor their applications will be introduced.</div>                                                                                                                                                                                                                                                                                                                        |                |
| Course Content                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                |
| Unit                          | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Weightage* (%) |
| 1.                            | <b>Basics of Measurements:</b> Accuracy, Precision, resolution, reliability, repeatability, validity, Errors and their analysis, Standards of measurement.<br><b>Bridge DC Bridge:</b> Wheatstone Bridge, Kelvin Bridge, Un-balance condition , Ac Bridge: Maxwell Bridge, Hay Bridge, Wein Bridge, Schearing Bridge                                                                                                                                                                                                                                                                                    | 25%            |
| 2.                            | <b>Oscilloscopes:</b> Cathode Ray Tube, Vertical and Horizontal Deflection Systems, Delay lines, Probes and Transducers, Specification of an Oscilloscope. Oscilloscope measurement Techniques, Special Oscilloscopes – Storage Oscilloscope, Sampling Oscilloscope.<br><b>Signal Generators:</b> Sine wave generator, Frequency – Synthesized Signal Generator, Sweep frequency Generator. Pulse and square wave generators. Function Generators.                                                                                                                                                      | 25%            |
| 3                             | <b>Measuring Instruments :</b> Introduction, Classification, Analog: Voltmeter, Ohmmeter, Q-meter, Digital voltmeter (DVM), Specification and advantages of DVM, Ramp type DVM, Successive approximation                                                                                                                                                                                                                                                                                                                                                                                                | 25%            |
| 4                             | <b>Signal Analysis:</b> Wave Analyzer, Spectrum Analyzer. Frequency Counters: Simple Frequency Counter; Measurement errors; extending frequency range of counters Transducers: Types, Strain Gages, Displacement Transducers.                                                                                                                                                                                                                                                                                                                                                                           | 25%            |
| Teaching-Learning Methodology | <div>Direct Teaching through Chalk-Walk and Talk</div> <div>ICT enabled teaching</div> <div>Question-Answer</div> <div>Class discussion led by teacher/students</div> <div>Case Studies</div> <div>Literature review</div> <div>Problem solving activities</div>                                                                                                                                                                                                                                                                                                                                        |                |



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|                                                                                                                                                                                                                                                                            | Debate<br>Collaborative and Co-operative Learning<br>Think Pair Share<br>Jigsaw<br>Inquiry Based Learning<br>Panel Discussion<br>Project Based Learning<br>Flipped Classroom<br>Blended Learning designs<br>Concept Mapping |                  |
| <b>Evaluation Pattern</b>                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                             |                  |
| <b>Sr. No.</b>                                                                                                                                                                                                                                                             | <b>Details of the Evaluation</b>                                                                                                                                                                                            | <b>Weightage</b> |
| 1.                                                                                                                                                                                                                                                                         | Internal Written / Practical Examination Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3)                                                        | 50%              |
| 2.                                                                                                                                                                                                                                                                         | University Examination                                                                                                                                                                                                      | 50%              |
| Course Outcomes: On the successful completion of the course, the students should be able to apply their knowledge to solve problems, analyze complex issues, design solutions, conduct investigations, and understand the societal and ethical implications of their work. |                                                                                                                                                                                                                             |                  |
| <b>Suggested References:</b>                                                                                                                                                                                                                                               |                                                                                                                                                                                                                             |                  |
| <b>Sr. No.</b>                                                                                                                                                                                                                                                             | <b>References</b>                                                                                                                                                                                                           |                  |
| 1.                                                                                                                                                                                                                                                                         | Modern Electronics Instrumentation and Measurement Techniques – A.D. Helfrick, W.D.Cooper                                                                                                                                   |                  |
| 2.                                                                                                                                                                                                                                                                         | Electronics Instrumentation and Measurement system – J.G. Joshi                                                                                                                                                             |                  |
| 3.                                                                                                                                                                                                                                                                         | Elements of Electronics Instrumentation and Measurement-3rd Edition by Joshph J.Carr.Pearson Education. Selected portion from Ch.1,2,4,7,8,9,13,14,18,23 and 25.                                                            |                  |
| 4.                                                                                                                                                                                                                                                                         | Modern Electronics Instrumentation & Measurement Techniques, by Albert D.Helstrick and William D.Cooper, Pearson Education. Selected portion from Ch.1, 5-13.                                                               |                  |
| On-line resources to be used if available as reference material                                                                                                                                                                                                            |                                                                                                                                                                                                                             |                  |
| On-line Resources:                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                             |                  |
| <a href="https://www.electronics-tutorials.ws/">https://www.electronics-tutorials.ws/</a><br><a href="https://www.electronicshub.org/tutorials/">https://www.electronicshub.org/tutorials/</a><br><a href="http://www.allaboutcircuits.com">www.allaboutcircuits.com</a>   |                                                                                                                                                                                                                             |                  |

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**With Effect from: June – 2025**  
**Bachelor of Science**  
**B.Sc. Electronics and Communication Semester VI**  
**(Major subject)**

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|-----------------------------|-----------------------------------------|-------------|---------------------|-----------------------------------------|----------------|
| Course Code                 |                                         | US06MAELC03 | Title of the Course | Electronics and Communication Practical |                |
| Total Credits of the Course |                                         | 04          | Hours per Week      | 08                                      |                |
| Course Content              |                                         |             |                     |                                         |                |
| Sr. No.                     | List of Experiments                     |             |                     |                                         | Weightage* (%) |
| Section A                   |                                         |             |                     |                                         |                |
| 1.                          | To study the sampling theorem.          |             |                     |                                         | 50%            |
| 2.                          | To study the Pulse Position Modulation. |             |                     |                                         |                |
| 3.                          | To study the Pulse Width Modulation.    |             |                     |                                         |                |
| 4.                          | To study the Pulse Amplitude Modulation |             |                     |                                         |                |
| 5.                          | To study the Amplitude Shift Keying.    |             |                     |                                         |                |
| 6.                          | To study the Phase Shift Keying         |             |                     |                                         |                |
| 7.                          | To study Maxwell Bridge                 |             |                     |                                         |                |
| 8.                          | To study Wheatstone Bridge              |             |                     |                                         |                |
| 9.                          | To study the Frequency Shift Keying.    |             |                     |                                         |                |
| 10.                         | To study the Pulse Code Modulation      |             |                     |                                         |                |
| Section B                   |                                         |             |                     |                                         |                |
| 1.                          | Project Work                            |             |                     |                                         | 50%            |



**SARDAR PATEL UNIVERSITY**  
**Syllabus Structure B.Sc. Semester: VI**

**With Effect from: June – 2025**

**Bachelor of Science**

**B.Sc. Electronics and Communication Semester VI**

**(Minor subject)**

| <b>Course Code</b>                                                                 | <b>US06MIELC01</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <b>Title of the Course</b> | <b>Data Communication and Network</b> |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------------------|
| <b>Total Credits of the Course</b>                                                 | <b>02</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <b>Hours per Week</b>      | <b>02</b>                             |
| Programme Outcome (PO) - For B.Sc. Electronics and Communication Programme         | <ol style="list-style-type: none"> <li>1. Bachelor of Science degree program provides theoretical and practical knowledge of different Science subjects in consonance with National Education Policy 2020.</li> <li>2. This programme provides a flexibility to students to acquire certificate course, diploma course, degree programme, honours degree with or without research having multi entry and multi exit facilities.</li> <li>3. Bachelor of Science programme at Sardar Patel University is designed keeping the overall back ground preparation in mind for the student to either opt for a Master programme or jobs or to become an entrepreneur.</li> <li>4. At the entry level of the programme, i.e., semester one, various subjects offered as major subject, minor subject, interdisciplinary subject as per choice of the students.</li> <li>5. In addition to that, some skill enhancement courses, ability enhancement courses and value-added courses are also offered for overall development of the students.</li> <li>6. After end of the even semesters, the students may take exit after fulfilling the minimum requirements.</li> <li>7. The students have the enough opportunity to complete four-year graduation programme with any major subject as per their choice.</li> <li>8. The students, after completion of the program from Sardar Patel University, can opt for the master's degree programme in the subject they have had at the final semester, or in a related discipline.</li> </ol> |                            |                                       |
| Programme Specific Outcome (PSO) – B.Sc. (Electronics and Communication) Programme | <ol style="list-style-type: none"> <li>1. To improve the scientific awareness among the students.</li> <li>2. To make students to understand the role and contribution of Electronics and Communication in the development of science and technology.</li> <li>3. To improve scientific attitude and to give emphasis on the development of experimental skills, data analysis, calculations, and also on the limitations of the experimental method and data as well as results obtained.</li> <li>4. To help students in understanding the concepts of Electronics and</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                            |                                       |



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|                               | <p>Communication.</p> <p>5. To emphasize the strength of equations, formulae, graphs, mathematical tools to solve the problems.</p> <p>6. To understand the conceptual development of the subject and thereby develop the interest in the subject.</p> <p>7. To create interest in the subject and improve technological aspect through mini projects, projects, models, demonstrations, etc.</p> <p>8. To create interest in the subject to continue to work in the field of science particularly in Electronics and Communication.</p> <p>9. To Understand the impact of electronics in modern era.</p> |                       |
| <b>Course Objectives:</b>     | <p>1. In this course, students will be learning about the electronics instrument which were used in our day to-day life.</p> <p>2. To understand the basics of semiconductor components like resistor, capacitor and inductor their applications will be introduced.</p>                                                                                                                                                                                                                                                                                                                                  |                       |
| <b>Course Content</b>         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                       |
| <b>Unit</b>                   | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <b>Weightage* (%)</b> |
| <b>1.</b>                     | <b>Data Communication and Contention Protocols</b><br>Transmission modes, serial and parallel transmission asynchronous transmission, simplex, half-duplex and full-duplex communication, Interface standard: RS-232 interface, RS 232 subsets, null modems, RS- 449 interface, X 21 interface , Aloha protocols, carrier sense multiple access, Collision detection, Token passing.                                                                                                                                                                                                                      | <b>50%</b>            |
| <b>2.</b>                     | <b>Data Security and Integrity</b><br>Introduction, parity checking: Parity checking analysis, double-bit error detection, cyclic Redundancy Checks, polynomial division, CRC working, analysis of CRC, CRC implementation using circular shifts. Hamming codes: single-bit error correction, multiple-bit error correction comparison of error detection and error correction, Viruses infecting files, memory resident viruses, virus evolution, virus sources, Internet worm, Computer hackers                                                                                                         | <b>50%</b>            |
| Teaching-Learning Methodology | Direct Teaching through Chalk-Walk and Talk<br>ICT enabled teaching<br>Question-Answer<br>Class discussion led by teacher/students<br>Case Studies<br>Literature review<br>Problem solving activities<br>Debate<br>Collaborative and Co-operative Learning<br>Think Pair Share<br>Jigsaw<br>Inquiry Based Learning                                                                                                                                                                                                                                                                                        |                       |



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|                                                                                                                                                                                                                                                                            | Panel Discussion<br>Project Based Learning<br>Flipped Classroom<br>Blended Learning designs<br>Concept Mapping                                                       |           |
| Evaluation Pattern                                                                                                                                                                                                                                                         |                                                                                                                                                                      |           |
| Sr. No.                                                                                                                                                                                                                                                                    | Details of the Evaluation                                                                                                                                            | Weightage |
| 1.                                                                                                                                                                                                                                                                         | Internal Written / Practical Examination Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3) | 50%       |
| 2.                                                                                                                                                                                                                                                                         | University Examination                                                                                                                                               | 50%       |
| Course Outcomes: On the successful completion of the course, the students should be able to apply their knowledge to solve problems, analyze complex issues, design solutions, conduct investigations, and understand the societal and ethical implications of their work. |                                                                                                                                                                      |           |
| Suggested References:                                                                                                                                                                                                                                                      |                                                                                                                                                                      |           |
| Sr. No.                                                                                                                                                                                                                                                                    | References                                                                                                                                                           |           |
| 1.                                                                                                                                                                                                                                                                         | Data Communication and Networking - B.A.Forouzan                                                                                                                     |           |
| 2.                                                                                                                                                                                                                                                                         | Computer Networks – A.S.Tannenbaum                                                                                                                                   |           |
| On-line resources to be used if available as reference material                                                                                                                                                                                                            |                                                                                                                                                                      |           |
| On-line Resources:                                                                                                                                                                                                                                                         |                                                                                                                                                                      |           |
| <a href="https://www.electronics-tutorials.ws/">https://www.electronics-tutorials.ws/</a><br><a href="https://www.electronicshub.org/tutorials/">https://www.electronicshub.org/tutorials/</a><br><a href="http://www.allaboutcircuits.com">www.allaboutcircuits.com</a>   |                                                                                                                                                                      |           |

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**Bachelor of Science**  
**B.Sc. Electronics and Communication Semester VI**  
**(Minor subject)**

|                                    |                            |                            |                                                |
|------------------------------------|----------------------------|----------------------------|------------------------------------------------|
| <b>Course Code</b>                 | <b>US06MIELC02</b>         | <b>Title of the Course</b> | <b>Electronics and Communication Practical</b> |
| <b>Total Credits of the Course</b> | <b>02</b>                  | <b>Hours per Week</b>      | <b>04</b>                                      |
| <b>Course Content</b>              |                            |                            |                                                |
| <b>Sr. No.</b>                     | <b>List of Experiments</b> |                            | <b>Weightage* (%)</b>                          |
| <b>1.</b>                          | PARITY CHECKING ANALYSIS   |                            |                                                |
| <b>2.</b>                          | HALF-DUPLEX                |                            |                                                |
| <b>3</b>                           | FULL-DUPLEX COMMUNICATION  |                            |                                                |
| <b>4</b>                           | ERROR DETECTION            |                            |                                                |
| <b>5</b>                           | ERROR CORRECTION           |                            |                                                |
| <b>6</b>                           | RS-232 INTERFACE           |                            |                                                |

