# SARDAR PATEL UNIVERSITY
## Syllabus Structure B.Sc. Semester: II
## With Effect from: June – 2023
## Bachelor of Science
## B.Sc. Electronics and Communication Semester II

| Course Code | US02MACELC01 | Title of the Course | Electronics Devices and Circuits |
|---|---|---|---|
| Total Credits of the Course | 04 | Hours per Week | 04 |

| Course Objectives: | 1. In this course, students will be introduced to fundamental basic electronics with application.<br>2. To understand the basics of semiconductor components like transistor and their applications. |
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| Course Content | | |
|---|---|---|
| **Unit** | **Description** | **Weightage* (%)** |
| **1.** | **Bipolar Junction Transistors DC Circuits** : Transistor Configurations: CE, CB and CC, The Operating Point, Bias Stability, Transistor, Fixed bias, Emitter Bias, Self-Bias etc., Stabilization against Variations in ICO, VBE and β, Thermal Runaway. | **25%** |
| **2.** | **Feedback amplifiers** : The Feedback Concept, Types of Feedback General Characteristics of Negative- Feedback Amplifiers, Topologies of Negative-Feedback, Negative- Feedback on Gain, Input Resistance, Output Resistance & Bandwidth of Amplifier, | **25%** |
| **3.** | **Oscillators :** Introduction to Oscillation, Positive feedback as a oscillator**,** Sinusoidal Oscillators, RC Oscillator : The Transistor Phase-Shift Oscillator, Wein Bridge Oscillator, LC Oscillator : Hartley & Colpitts Oscillator, Crystal Oscillator and its circuits | **25%** |
| **4** | Transducers: Principles, Classification and selection of Transducers, Requirements, Types and Application of Transducers, Resistance, Capacitance, inductance Transducers, Potentiometer, Strain gauges, LVDT, Piezo Electric transducers, Resistance Thermometers, Thermocouples, Thermistors. | **25%** |

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| 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<br>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 (As per CBCS R.6.8.3) | 15% |
| 2. | Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3) | 15% |
| 3. | University Examination | 70% |

| **Suggested References:** | |
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| **Sr.** | **References** |
| 1. | Electronic Instrumentation & Measurement by William D Cooper & Albert C. Helfric, PHI Publications |
| 2. | Donald Neaman, “Electronic Circuit Analysis and Design”,3rd Edition, TataMcGraw Hill. |
| 3. | David A. Bell,“Electronic Devices and Circuits”, 5thEdition, Oxford press |
| 4. | Electronic Measurements and Instrumentation by R.S. Sedha, S. Chand Publications. |
| 5. | Millman Halkias, “Integrated Electronics-Analog and Digital Circuits and Systems”, Tata McGraw Hill, 2000. |

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| On-line resources to be used if available as reference material |
| On-line Resources: |
| https://www.electronics-tutorials.ws/<br>https://www.electronicshub.org/tutorials/<br>www.allaboutcircuits.com |
| https://www.allaboutcircuits.com/textbook/direct-current/chpt-10/what-is-network-analysis/ |

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**SARDAR PATEL UNIVERSITY**
**Syllabus Structure B.Sc. Semester: II**
**With Effect from: June – 2023**
**Bachelor of Science**
**B.Sc. Electronics and Communication Semester II**
**(Major subject- Minor subject - Interdisciplinary subject)**

| **Course Code** | **US02MAELC02** | **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* (%)** |
| **1.** | Study function generator/Arbitrary waveform generator. (Generate signal of required amplitude, frequency, duty cycle, offset etc) | |
| **2.** | Measurement of displacement using LVDT. | |
| **3** | Temperature measurement using Thermistor/ Thermocouple. | |
| **4** | Construct the CE Transistor Configuration for the verification of input and output Characteristics. | |
| **5** | Construct the CB Transistor Configuration for the verification of input and output Characteristics. | |
| **6** | Construct the CC Transistor Configuration for the verification of input and output Characteristics. | |
| **7** | Hartley Oscillator. | |
| **8** | Collpitt's Oscillator. | |
| **9** | Phase Shift Oscillator. | |
| **10** | Wein Bridge Oscillator. | |

# SARDAR PATEL UNIVERSITY
## Syllabus Structure B.Sc. Semester: II
## With Effect from: June – 2023
## Bachelor of Science
## B.Sc. Electronics and Communication Semester II

| Course Code | US2MICELC01 | Title of the Course | Electronics Devices and Circuits |
|---|---|---|---|
| Total Credits of the Course | 02 | Hours per Week | 02 |

| Course Objectives: | 1. In this course, students will be introduced to fundamental basic electronics with application.<br>2. To understand the basics of semiconductor components like transistor and their applications. |
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| Course Content | | |
|---|---|---|
| **Unit** | **Description** | **Weightage* (%)** |
| **1.** | **Bipolar Junction Transistors DC Circuits** : Transistor Configurations: CE, CB and CC, The Operating Point, Bias Stability, Transistor, Fixed bias, Emitter Bias, Self-Bias etc., Stabilization against Variations in ICO, VBE and β, Thermal Runaway. | **25%** |
| **2.** | **Feedback amplifiers** : The Feedback Concept, Types of Feedback General Characteristics of Negative- Feedback Amplifiers, Topologies of Negative-Feedback, Negative- Feedback on Gain, Input Resistance, Output Resistance & Bandwidth of Amplifier, | **25%** |

| 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 |
|---|---|

| | |
|---|---|
| | Inquiry Based Learning<br>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 (As per CBCS R.6.8.3) | 15% |
| 2. | Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3) | 15% |
| 3. | University Examination | 70% |

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| 5. | Donald Neaman, “Electronic Circuit Analysis and Design”,3rd Edition, TataMcGraw Hill. |
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| On-line resources to be used if available as reference material |
| On-line Resources: |
| https://www.electronics-tutorials.ws/<br>https://www.electronicshub.org/tutorials/<br>www.allaboutcircuits.com |
| https://www.allaboutcircuits.com/textbook/direct-current/chpt-10/what-is-network-analysis/ |

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**Syllabus Structure B.Sc. Semester: II**
**With Effect from: June – 2023**
**Bachelor of Science**
**B.Sc. Electronics and Communication Semester II**
**(Major subject- Minor subject - Interdisciplinary subject)**

| **Course Code** | **US02MIELC02** | **Title of the Course** | **Electronics and Communication Practical** |
|---|---|---|---|
| **Total Credits of the Course** | **02** | **Hours per Week** | **04** |

| **Course Content** | | |
|---|---|---|
| **Sr. No.** | **List of Experiments** | **Weightage* (%)** |
| **1.** | Study function generator/Arbitrary waveform generator. (Generate signal of required amplitude, frequency, duty cycle, offset etc) | |
| **2.** | Measurement of displacement using LVDT. | |
| **3** | Temperature measurement using Thermistor/ Thermocouple. | |
| **4** | Construct the CE Transistor Configuration for the verification of input and output Characteristics. | |
| **5** | Construct the CB Transistor Configuration for the verification of input and output Characteristics. | |
| **6** | Construct the CC Transistor Configuration for the verification of input and output Characteristics. | |