**Bachelor of Science**

**Electronics**

**Semester: I**

**(Major Course)**

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| Course Code | US01MAELE01 | Title of the Course | Fundamentals of Electronics. |
| Total Credits of the Course | 4 | Hours per Week | 4 |

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| Course Objectives: | The course is to make the students understand   1. The fundamentals of electronic components, 2. Network theorems 3. Working of PN junction and other diodes. 4. Power supplies. |

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| **Course Content** | | |
| **Unit** | **Description** | **Weightage**  **In %** |
| **1.** | **Resistors:** General Information, resistance of resistor and Symbol,  Resistor Types: Carbon composition, Carbon film, Wire wound, Colour Coding, Variable resistors, Potentiometers, Rheostats.  **Capacitors:** General Information and Symbol, Capacitance of Capacitors.  Capacitor Types: Mica, Ceramic, Paper and Electrolytic Capacitors and Variable capacitors.  **Inductor:** General information and Symbol.  Inductor Types: Air-core, Iron-core and Ferrite-core inductor.  Inductance of Inductor, Variable inductance. | **25** |
| **2.** | **Network Theorems:**  Series and Parallel Connections of Resistors. Series and Parallel Connections of Capacitors, Series and Parallel Connections of Inductors.  Ohm’s Law, Kirchhoff’s Voltage and Current laws, Superposition theorem, Network analysis by Mesh Currents, Circuit analysis by Node Pair voltages, Thevenin’s theorem, Norton theorem, Thevenin- Norton conversion. | **25** |
| **3** | **Diodes:** PN Junction theory, Forward Biased PN junction, Reverse Biased PN junction, VI characteristics of PN Junction diode.  **DC Power Supplies:**  Block Diagram of Power supply.  Rectifiers: Half wave, Centre tapped and Bridge type Full wave.  Filters: Series Inductors, shunt capacitor, LC Filter and PI filter. | **25** |
| **4** | **Special type Diodes:**  Zener Diode, Voltage regulation, Zener diode as peak clipper, Meter protection, Tunnel effect, Tunnel diode, Tunnel diode oscillator, Varactor diode, PIN diode, Schottky diode, Light emitting diode, Thermistor. | **25** |

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| Teaching-Learning Methodology | Online and Board work |

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| 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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| Course Outcomes: Having completed this course, the learner will be able to | |
| 1. | Helps to understand the various passive electronic components and to analyze their simple circuit using network theorems. |
| 2. | Make students understand basic electronics circuits and their troubleshooting. |
| 3 | Helps to understand the various diodes and their applications. |
| 4 | Make students understand and troubleshooting of diode circuits. |

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| Suggested References: | |
| Sr. No. | References |
| 1. | Basic Electronics and Linear Circuits  By Bhargava, Kulshreshtha and Gupta. |
| 2. | Electrical Engineering Fundamentals  By Del Toro. |
| 3 | Electronics Devices and Circuits  By David A. Bell. |

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| On-line resources to be used if available as reference material |
| On-line Resources |

**Bachelor of Science**

**Electronics**

**Semester: I**

**(Major Course)**

**Practicals**

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| Course Code | US01MAELE02 | Title of the Course | Electronics Practicals. |
| Total Credits of the Course | 4 | Hours per Week | 8 |

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| Course Objectives: | To make the students understand the fundamentals of electronics components and Power supplies, Cathode Ray Oscilloscope and their applications. |

**Part -1**

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| **Course Content** | | |
| **No** | **Title of Practical** |  |
| **1.** | Study of Multimeter and Power Supply. |  |
| **2.** | Study of Oscilloscope. |  |
| **3.** | Oscilloscope Applications. |  |
| **4.** | Self Inductance of Coil. |  |
| **5.** | Capacitance of Capacitor. |  |
| **6.** | Charging and discharging of capacitor. |  |
| **7.** | Study of Transformer. |  |
| **8.** | Measurement of Resistor using VI Method. |  |
| **9.** | Other experiments based on Theory. |  |

**Part -2**

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| **Course Content** | | |
| **No** | **Title of Practical** |  |
| **1.** | Forward Characteristics of PN junction Diode. |  |
| **2.** | Reverse Characteristics of PN junction Diode. |  |
| **3.** | Study of Half wave rectifiers. |  |
| **4.** | Study of Full wave rectifiers. |  |
| **5.** | Study of Filter Circuits. |  |
| **6.** | Characteristic of Thermistor |  |
| **7.** | Zener diode as Voltage regulator. |  |
| **8.** | Clipping Circuit using Zener Diode. |  |
| **9.** | Other experiments based on Theory. |  |

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| Teaching-Learning Methodology | Online and Board work |

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| 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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| Course Outcomes: Having completed this course, the learner will be able to | |
| 1. | Helps to understand the various passive and active electronics components. |
| 2. | Make students understand basic electronics circuits and their troubleshooting. |

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| Suggested References: | |
| Sr. No. | References |
| 1. | Basic Electronics and Linear Circuits  By Bhargava, Kulshreshtha and Gupta. |
| 2. | Electrical Engineering Fundamentals  By Del Toro. |

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| On-line Resources |

**Bachelor of Science**

**Electronics**

**Semester: I**

**(Minor Course)**

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| --- | --- | --- | --- |
| Course Code | US01MIELE01 | Title of the Course | Basic Electronics. |
| Total Credits of the Course | 2 | Hours per Week | 2 |

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| Course Objectives: | The course is to make the students understand   1. The fundamentals of electronic components and 2. Network theorems. |

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| **Course Content** | | |
| **Unit** | **Description** | **Weightage**  **In %** |
| **1.** | **Resistors:** General Information, resistance of resistor and Symbol,  Resistor Types: Carbon composition, Carbon film, Wire wound, Colour Coding, Variable resistors, Potentiometers, Rheostats.  **Capacitors:** General Information and Symbol, Capacitance of Capacitors.  Capacitor Types: Mica, Ceramic, Paper and Electrolytic Capacitors and Variable capacitors.  **Inductor:** General information and Symbol.  Inductor Types: Air-core, Iron-core and Ferrite-core inductor.  Inductance of Inductor, Variable inductance. | **50** |
| **2.** | **Network Theorems:**  Series and Parallel Connections of Resistors. Series and Parallel Connections of Capacitors, Series and Parallel Connections of Inductors.  Ohm’s Law, Kirchhoff’s Voltage and Current laws, Superposition theorem, Network analysis by Mesh Currents, Circuit analysis by Node Pair voltages. | **50** |

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| Teaching-Learning Methodology | Online and Board work |

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| 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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| Course Outcomes: Having completed this course, the learner will be able to | |
| 1. | Helps to understand the various passive electronic components and to analyze their simple circuit using network theorems. |
| 2. | Make students understand basic electronics circuits and their troubleshooting. |

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| Suggested References: | |
| Sr. No. | References |
| 1. | Basic Electronics and Linear Circuits  By Bhargava, Kulshreshtha and Gupta. |
| 2. | Electrical Engineering Fundamentals  By Del Toro. |

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| On-line Resources |

**Bachelor of Science**

**Electronics**

**Semester: I**

**(Minor Course)**

**Practicals**

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| Course Code | US01MIELE02 | Title of the Course | Electronics Practicals |
| Total Credits of the Course | 2 | Hours per Week | 4 |

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| Course Objectives: | To make the students understand   1. The fundamentals of electronics components 2. Power supplies and Multi meters 3. Cathode Ray Oscilloscope and their applications. 4. Signal Generators |

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| **Course Content** | | |
| **No** | **Title of Practical** |  |
| **1.** | Study of Multimeter and Power Supply. |  |
| **2.** | Study of Oscilloscope. |  |
| **3.** | Oscilloscope Applications. |  |
| **4.** | Self Inductance of Coil. |  |
| **5.** | Capacitance of Capacitor. |  |
| **6.** | Charging and discharging of capacitor. |  |
| **7.** | Study of Transformer. |  |
| **8.** | Measurement of Resistor using VI Method. |  |
| **9.** | Other experiments based on Theory. |  |

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| Teaching-Learning Methodology | Online and Board work |

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| 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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| Course Outcomes: Having completed this course, the learner will be able to | |
| 1. | Helps to understand the various passive and active electronics components. |
| 2. | Make students understand basic electronics circuits and their troubleshooting. |

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| Suggested References: | |
| Sr. No. | References |
| 1. | Basic Electronics and Linear Circuits  By Bhargava, Kulshreshtha and Gupta. |
| 2. | Electrical Engineering Fundamentals  By Del Toro. |

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| On-line Resources |

**Bachelor of Science**

**Electronics**

**Semester: I**

**(Inter Disciplinary Course)**

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| Course Code | US01IDELE01 | Title of the Course | Fundamentals of Electronics. |
| Total Credits of the Course | 2 | Hours per Week | 2 |

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| Course Objectives: | The course is to make the students understand   1. The fundamentals of electronic components. 2. Network theorems. |

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| **Course Content** | | |
| **Unit** | **Description** | **Weightage**  **In %** |
| **1.** | **Network Theorems:**  Series and Parallel Connections of Resistors. Series and Parallel Connections of Capacitors, Series and Parallel Connections of Inductors.  Ohm’s Law, Kirchhoff’s Voltage and Current laws, Superposition theorem, Network analysis by Mesh Currents, Circuit analysis by Node Pair voltages. | **50** |
| **2.** | **Resistors:** General Information, resistance of resistor and Symbol,  Resistor Types: Carbon composition, Carbon film, Wire wound, Colour Coding, Variable resistors, Potentiometers, Rheostats.  **Capacitors:** General Information and Symbol, Capacitance of Capacitors.  Capacitor Types: Mica, Ceramic, Paper and Electrolytic Capacitors and Variable capacitors.  **Inductor:** General information and Symbol.  Inductor Types: Air-core, Iron-core and Ferrite-core inductor.  Inductance of Inductor, Variable inductance. | **50** |

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| Teaching-Learning Methodology | Online and Board work |

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| 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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| Course Outcomes: Having completed this course, the learner will be able to | |
| 1. | Helps to understand the various passive electronic components and to analyze their simple circuit using network theorems. |
| 2. | Make students understand basic electronics circuits and their troubleshooting. |

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| Suggested References: | |
| Sr. No. | References |
| 1. | Basic Electronics and Linear Circuits  By Bhargava, Kulshreshtha and Gupta. |
| 2. | Electrical Engineering Fundamentals  By Del Toro. |

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| On-line Resources |

**Bachelor of Science**

**Electronics**

**Semester: I**

**(Inter Disciplinary Course)**

**Practicals**

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| --- | --- | --- | --- |
| Course Code | US01IDELE02 | Title of the Course | Electronics Practicals |
| Total Credits of the Course | 2 | Hours per Week | 4 |

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| Course Objectives: | To make the students understand   1. The fundamentals of electronics components 2. Power supplies, 3. Cathode Ray Oscilloscope and their applications. |

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| **Course Content** | | |
| **No** | **Title of Practical** |  |
| **1.** | Study of Multimeter and Power Supply. |  |
| **2.** | Study of CRO. |  |
| **3.** | CRO Applications. |  |
| **4.** | Self Inductance of Coil. |  |
| **5.** | Capacitance of Capacitor. |  |
| **6.** | Charging and discharging of capacitor. |  |
| **7.** | Study of Transformer. |  |
| **8.** | Measurement of Resistor using VI Method. |  |
| **9.** | Other experiments based on Theory. |  |

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| Teaching-Learning Methodology | Online and Board work |

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| 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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| Course Outcomes: Having completed this course, the learner will be able to | |
| 1. | Helps to understand the various passive and active electronics components. |
| 2. | Make students understand basic electronics circuits and their troubleshooting. |

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| Suggested References: | |
| Sr. No. | References |
| 1. | Basic Electronics and Linear Circuits  By Bhargava, Kulshreshtha and Gupta. |
| 2. | Electrical Engineering Fundamentals  By Del Toro. |

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| On-line Resources |

**Bachelor of Science**

**Electronics**

**Semester: I**

**(Skill Enhancement Course)**

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| --- | --- | --- | --- |
| Course Code | US01SEELE01 | Title of the Course | Fundamentals of Computer Hardware-1. |
| Total Credits of the Course | 2 | Hours per Week | 2 |

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| Course Objectives: | The course is to make the students understand   1. Fundamentals of Computer. 2. Various primary and secondary storage devices |

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| **Course Content** | | |
| **Unit** | **Description** | **Weightage**  **In %** |
| **1.** | **System Concepts Primary Storage Unit**  System concept: Input unit, Output unit, Storage unit, Arithmetic and logic unit, control unit, central processing unit  Primary Storage unit: Storage locations and addresses, Storage capacity,  Fixed and Variable word length storage, RAM, ROM, PROM , EPROM, CACHE memory, Registers | **50** |
| **2.** | **Secondary Storage Devices:**  Sequential and direct access devices, Magnetic storage devices:  Magnetic disc, Hard disk, removable disk, diskettes, Optical storage  devices: CD-ROM, DVD-ROM, Flash Memory, Smart Cards | **50** |

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| Teaching-Learning Methodology | Online and Board work |

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| Evaluation Pattern | | |
| Sr. No. | Details of the Evaluation | Weightage |
| 1. | Internal Written / Practical Examination (As per CBCS R.6.8.3) |  |
| 2. | Internal Continuous Assessment in the form of Practical, Viva-voce, Quizzes, Seminars, Assignments, Attendance (As per CBCS R.6.8.3) |  |
| 3. | University Examination | 100% |

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| Course Outcomes: Having completed this course, the learner will be able to | |
| 1. | Understand the constituents of the modern computer systems. |
| 2. | Make students understand basic organizations of computer, primary and secondary storage. |

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| Suggested References: | |
| Sr. No. | References |
| 1. | Computer Fundamentals By P.K. Sinha (BPB Publications) |
| 2. | Introduction To Computers By Peter Norton (sixth edition) (The McGraw– Hill Companies) |

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| On-line resources to be used if available as reference material |
| On-line Resources |