Bachelor of Science (Undergraduate)
Electronics
Semester: I
(Major Course)

Course Code	US01MAELE01	Title of the Course	Fundamentals of Electronics.
Total Credits of the Course	04	Hours per Week	04

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.

Course Content		
Unit	**Description**	**Weightage %**
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. **Special type Diodes:** Zener Diode, Voltage regulation, Zener diode as peak clipper, Meter	**25**

	protection, Tunnel effect, Tunnel diode, Tunnel diode oscillator, Varactor diode, PIN diode, Schottky diode, Light emitting diode, Thermistor.	
4	**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**

Teaching-Learning Methodology	• Online and Board work, • ICT enabled teaching, • Group discussion, • Case Study, • Problem solving.

Evaluation Pattern			
Sr. No.		Details of the Evaluation	Weightage
1.	Continuous and Comprehensive Evaluation	• Class test/Internal Written test (30%) • Quiz (30%) • Active learning (10%) • Home Assignments (10%) • Class Assignments (10%) • Attendance (10%)	50%
2.	End Semester Examination	Written Test 100 %	50%

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.

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.

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

Bachelor of Science (Undergraduate)
Electronics
Semester: I
(Major Course)
Practicals

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

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

Part -1

Course Content		
No	**Title of Practical**	Weightage
1.	Study of Multimeter and Power Supply.	**50%**
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

Course Content		
No	**Title of Practical**	Weightage
1.	Forward Characteristics of PN junction Diode.	**50%**
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.	

Teaching-Learning Methodology	Online and Board work

Evaluation Pattern			
Sr. No.		Details of the Evaluation	Weightage
1.	Continuous and Comprehensive Evaluation	• Lab Work Assessment (40%) • Viva Voce/ Lab Quiz (40%) • Attendance (10%)	50%
2.	End Semester Examination	• Lab Work Assessment (40%) • Viva Voce/ Lab Quiz (40%) • Attendance (10%)	50%

Course Outcomes: Having completed this course, the learner will be able to

1.	Apply the various procedures and techniques for the experiments.
2.	Use different measuring devices and meters to record the data with precision.
3	Apply the mathematical concepts/equations to obtain quantitative results.
4	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results.

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

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

Bachelor of Science (Undergraduate)
Electronics
Semester: I
(Minor Course)

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

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

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**

Teaching-Learning Methodology	• Online and Board work, • ICT enabled teaching, • Group discussion, • Case Study,

	• Problem solving.

Evaluation Pattern (Internal / External Examinations)			
Sr. No.		Details of the Evaluation	Weightage
1.	Continuous and Comprehensive Evaluation	• Class test/Internal Written test (30%) • Quiz (30%) • Active learning (10%) • Home Assignments (10%) • Class Assignments (10%) • Attendance (10%)	50%
2.	Semester End Examination	Written Test 100 %	50%

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.

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

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

Bachelor of Science
Electronics
Semester: I
(Minor Course)
Practicals

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

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

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.	

Teaching-Learning Methodology	Online and Board work

Evaluation Pattern (Internal / External Examinations)			
Sr. No.		Details of the Evaluation	Weightage
1.	Continuous and Comprehensive Evaluation	• Lab work assessment (40%) • Viva voice/ Lab Quiz (40%) • Attendance (10%)	50%
2.	End Semester Examination	• Lab work assessment (40%) • Viva voice/ Lab Quiz (40%) • Attendance (10%)	50%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Apply the various procedures and techniques for the experiments.
2.	Use different measuring devices and meters to record the data with precision.
3	Apply the mathematical concepts/equations to obtain quantitative results.
4	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results.

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

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

Bachelor of Science
Electronics
Semester: I
(Inter Disciplinary Course)

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

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

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**

Teaching-Learning Methodology	• Online and Board work, • ICT enabled teaching, • Group discussion, • Case Study,

	• Problem solving.

Evaluation Pattern (Internal / External Examinations)			
Sr. No.		Details of the Evaluation	Weightage
1.	Continuous and Comprehensive Evaluation	• Class test/Internal Written test (30%) • Quiz (30%) • Active learning (10%) • Home Assignments (10%) • Class Assignments (10%) • Attendance (10%)	50%
2.	End Semester Examination	Written Test 100 %	50%

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.

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

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

Bachelor of Science
Electronics
Semester: I
(Inter Disciplinary Course)
Practicals

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

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

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.	

Evaluation Pattern (Internal / External Examinations)			
Sr. No.		Details of the Evaluation	Weightage

1.	Continuous and Comprehensive Evaluation	• Lab work assessment (40%) • Viva voice/ Lab Quiz (40%) • •Attendance (10%)	50%
2.	End Semester Examination	• Lab work assessment (40%) • Viva voice/ Lab Quiz (40%) • Attendance (10%)	50%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Apply the various procedures and techniques for the experiments.
2.	Use different measuring devices and meters to record the data with precision.
3	Apply the mathematical concepts/equations to obtain quantitative results.
4	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results.

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

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

Bachelor of Science
Electronics
Semester: I
(Skill Enhancement Course)

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

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

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**

Teaching-Learning Methodology	• Online and Board work, • ICT enabled teaching, • Group discussion, • Case Study, • Problem solving.

Evaluation Pattern (Internal / External Examinations)			
Sr. No.		Details of the Evaluation	Weightage

1.	Continuous and Comprehensive Evaluation	• Class test/Internal Written test (30%) • Quiz (30%) • Active learning (10%) • Home Assignments (10%) • Class Assignments (10%) • Attendance (10%)	50%
2.	End Semester Examination	Written Test 100 %	50%

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.

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)

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