



**Bachelor of Science
Electronics
Semester: I**

Course Code	UAS1MAELE01	Title of the Course	Basic Electronics
Total Credits of the Course	04	Hours per Week	04

Learning Objectives:	1. Students will learn various types of passive components like Resistors, Capacitors and Inductors, 2. Students will learn construction and applications of passive components like resistor, Capacitor and Inductors. 3. Students will learn various network theorems like Ohm's law, Kirchhoff's voltage and current law, Superposition Theorem, Voltage divider Theorem, Thevenin's Theorem, and Norton Theorem. Also to simplify and analyze complex electrical circuits. 4. Students will learn the construction and behavior of PN junction and Zener diode and explore the special purpose diodes. 5. Students will learn the working and construction of Electronics power supply.
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Course Outcomes:	1. Students will be able to identify and test the passive components. 2. Students will be able to analyze simple and complex circuits using network theorems. And apply various network theorems for efficient circuit reduction and performance evaluation. 3. Students will be able to analyze circuits made using PN junction diode and Zener diode. 4. Students will be able to test and evaluate practical application of special purpose diodes. 5. Students will be able to construct the electronics power supply for various applications and to trouble shoot for different faults.
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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's- 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 protection, Tunnel effect, Tunnel diode, Tunnel diode oscillator, Varactor diode, PIN diode, Schottky diode and Light Emitting Diode.	25%
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. Regulators: Zener diode as shunt regulator.	25%

Teaching-Learning Methodology	• Direct Teaching through Chalk-Walk and Talk. • Online and ICT enabled teaching. • Tutorials. • Group discussion. • Problem solving. • Question-Answer and Discussion led by teacher/students. • Literature review. • Inquiry Based Learning. • Project Based Learning.
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Evaluation Pattern (Internal / External Examinations)		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Continuous Assessment in the form of Internal Written Test, Quizzes, Assignments, Active learning, Viva-voce, Seminars, Attendance (As per NEP Guideline)	50%
2.	University examination	50%



Suggested References:

Sr. No.	References
1.	Basic Electronics and Linear Circuits, By Bhargava, Kulshreshtha and Gupta. McGraw Hill Education
2.	Electrical Engineering Fundamentals, By Vincent Del Toro, Prentice Hall of India.
3	Electronics Devices and Circuits, By David A. Bell. Prentice Hall of India.
On-line resources to be used if available as reference material	



Bachelor of Science

Electronics

Semester: I

Course Code	UAS1MAELE02	Title of the Course	Electronics Practicals.
Total Credits of the Course	4	Hours per Week	8

Laboratory - I

Learning Objectives:	1. To enable students to test active and passive electronic components, 2. To operate standard laboratory instruments such as Multi-meters, Power supplies, Function generators and Cathode Ray Oscilloscopes. 3. To study and analyzing simple analog circuits using various network theorems like Ohm's law, Kirchhoff's voltage and current law, Superposition Theorem, Voltage divider Theorem, Thevenin's Theorem, and Norton Theorem. Also to analyze and simplify complex electrical circuits.
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Course Outcomes:	1. Students will be able to identify and test basic electronic components like Resistor, Capacitors, Inductors, Diodes and Transistors. 2. Students will be able to effectively use standard laboratory instruments such as Multi-meters, Power supplies, Function generators and CROs for the measurement of various electronics parameters. 3. Students will be able to implement and analyze analog circuits using various network theorems such Ohm's law, Kirchhoff's voltage and current law, Superposition Theorem, Voltage divider Theorem, Thevenin's Theorem, and Norton Theorem.
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No	Title of Practical	Weightage
1.	Study of Multimeter and Power Supply.	50%
2.	Study of CRO and Function Generator.	
3.	Measurement of Frequency and Phase angle using CRO.	
4.	Measurement of Direct Voltage and Current using CRO.	
5.	Measurement of Alternating Voltage and Current using CRO.	
6.	Measurement of Self Inductance of a Coil.	
7.	Measurement of Capacitance of a Capacitor.	



8.	To study Charging and discharging of capacitor.	
9.	Study of Transformer.	
10.	Other experiments based on Theory.	

Laboratory - II

Learning Objectives:	1. Students will learn the characteristics of PN junction diode. 2. Students will learn various section of power supply such as rectifier, filter and regulator.
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Course Outcomes:	1. Students will be able to analyze circuits made from PN junction diode and Zener diode. 2. Students will be able to test and evaluate practical application of special purpose diodes. 3. Students will be able to construct the electronics power supply for various applications and to trouble shoot for different faults.
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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 (Half wave rectifier).	
6.	Study of Filter Circuits. (Full wave rectifier)	
7.	Zener diode as Voltage regulator (Line Regulation).	
8.	Zener diode as Voltage regulator (Load Regulation).	
9.	Clipping Circuit using Diode.	
10.	Other experiments based on Theory.	

Teaching-Learning Methodology	• Direct Teaching through Chalk-Walk and Talk. • Online and ICT enabled teaching. • Tutorials.
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	• Group discussion. • Problem solving. • Question-Answer and Discussion led by teacher/students. • Literature review. • Inquiry Based Learning. • Project Based Learning.
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Evaluation Pattern (Internal / External Examinations)		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Continuous Assessment in the form of Internal Practical Test, Quizzes, Assignments, Active learning, Viva-voce, Attendance (As per NEP Guideline)	50%
2.	University examination	50%

Suggested References:	
Sr. No.	References
1.	Basic Electronics and Linear Circuits, By Bhargava, Kulshreshtha and Gupta. McGraw Hill Education
2.	Electrical Engineering Fundamentals, By Vincent Del Toro, Prentice Hall of India.
On-line resources to be used if available as reference material	



**Bachelor of Science
Electronics
Semester: I**

Course Code	UAS1MIELE01	Title of the Course	Passive Components and Network Theorem
Total Credits of the Course	2	Hours per Week	2

Learning Objectives:	- Students will learn various types of passive components like Resistors, Capacitors and Inductors, - Students will learn construction and applications of passive components like resistor, Capacitor and Inductors. - Students will learn various network theorems like Ohm's law, Kirchhoff's voltage and current law, Superposition Theorem, Voltage divider Theorem, Thevenin's Theorem, and Norton Theorem. Also to simplify and analyze complex electrical circuits.
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Course Outcomes:	- Students will be able to identify and test the passive components. - Students will be able to analyze simple and complex circuits using network theorems. And apply various network theorems for efficient circuit reduction and performance evaluation.
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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.	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	• Direct Teaching through Chalk-Walk and Talk. • Online and ICT enabled teaching. • Tutorials. • Group discussion. • Problem solving. • Question-Answer and Discussion led by teacher/students. • Literature review. • Inquiry Based Learning. • Project Based Learning.
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Evaluation Pattern (Internal / External Examinations)		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Continuous Assessment in the form of Internal Written Test, Quizzes, Assignments, Active learning, Viva-voce, Seminars, Attendance (As per NEP Guideline)	50%
2.	University examination	50%

Suggested References:	
Sr. No.	References
1.	Basic Electronics and Linear Circuits, By Bhargava, Kulshreshtha and Gupta. McGraw Hill Education
2.	Electrical Engineering Fundamentals, By Vincent Del Toro, Prentice Hall of India.
On-line resources to be used if available as reference material	



Bachelor of Science

Electronics

Semester: I

Course Code	UAS1MIELE02	Title of the Course	Electronics Practicals
Total Credits of the Course	2	Hours per Week	4

Learning Objectives:	1. To enable students to test active and passive electronic components, 2. To operate standard laboratory instruments such as Multi-meters, Power supplies, Function generators and CROs. 3. To study and analyzing simple analog circuits using various network theorems like Ohm's law, Kirchhoff's voltage and current law, Superposition Theorem, Voltage divider Theorem, Thevenin's Theorem, and Norton Theorem. Also to analyze and simplify complex electrical circuits.
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Course Outcomes:	1. Students will be able to Identify and test basic electronic components like Resistor, Capacitors, Inductors, Diodes and Transistors. 2. Students will be able to effectively use standard laboratory instruments such as Multi-meters, Power supplies, Function generators and CROs for the measurement of various electronics parameters. 3. Students will be able to implement and analyze analog circuits using various network theorems such Ohm's law, Kirchhoff's voltage and current law, Superposition Theorem, Voltage divider Theorem, Thevenin's Theorem, and Norton Theorem.
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No	Title of Practical	Weightage
1.	Study of Multimeter and Power Supply.	100%
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	• Direct Teaching through Chalk-Walk and Talk. • Online and ICT enabled teaching. • Tutorials. • Group discussion. • Problem solving. • Question-Answer and Discussion led by teacher/students. • Literature review. • Inquiry Based Learning.
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Evaluation Pattern (Internal / External Examinations)		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Continuous Assessment in the form of Internal Practical Test, Quizzes, Assignments, Active learning, Viva-voce, Attendance (As per NEP Guideline)	50%
2.	University examination	50%

Suggested References:	
Sr. No.	References
1.	Basic Electronics and Linear Circuits, By Bhargava, Kulshreshtha and Gupta. McGraw Hill Education
2.	Electrical Engineering Fundamentals, By Vincent Del Toro, Prentice Hall of India.
On-line resources to be used if available as reference material	



**Bachelor of Science
Electronics
Semester: I**

Course Code	UAS1IDELE01	Title of the Course	Fundamentals of Electronics.
Total Credits of the Course	2	Hours per Week	2

Learning Objectives:	1. Students will learn various network theorems like Ohm's law, Kirchhoff's voltage and current law, Superposition Theorem, Voltage divider Theorem, Thevenin's Theorem, and Norton Theorem. Also to simplify and analyze complex electrical circuits. 2. Students will learn various types of passive components like Resistors, Capacitors and Inductors, 3. Students will learn construction and applications of passive components like resistor, Capacitor and Inductors.
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Course Outcomes:	1. Students will be able to analyze simple and complex circuits using network theorems. And apply various network theorems for efficient circuit reduction and performance evaluation. 2. Students will be able to identify and test the passive components.
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Unit	Description	Weightage
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	• Direct Teaching through Chalk-Walk and Talk. • Online and ICT enabled teaching. • Tutorials. • Group discussion. • Problem solving. • Question-Answer and Discussion led by teacher/students. • Literature review. • Inquiry Based Learning. • Project Based Learning.
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Evaluation Pattern (Internal / External Examinations)		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Continuous Assessment in the form of Internal Written Test, Quizzes, Assignments, Active learning, Viva-voce, Seminars, Attendance (As per NEP Guideline)	50%
2.	University examination	50%

Suggested References:	
Sr. No.	References
1.	Basic Electronics and Linear Circuits, By Bhargava, Kulshreshtha and Gupta. McGraw Hill Education
2.	Electrical Engineering Fundamentals, By Vincent Del Toro, Prentice Hall of India.
On-line resources to be used if available as reference material	



**Bachelor of Science
Electronics
Semester: I**

Course Code	UAS1IDELE02	Title of the Course	Electronics Practicals
Total Credits of the Course	2	Hours per Week	4

Learning Objectives:	1. To enable students to test active and passive electronic components, 2. To operate standard laboratory instruments such as Multi-meters, Power supplies, Function generators and CROs. 3. To study and analyzing simple analog circuits using various network theorems like Ohm's law, Kirchhoff's voltage and current law, Superposition Theorem, Voltage divider Theorem, Thevenin's Theorem, and Norton Theorem. Also to analyze and simplify complex electrical circuits.
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Course Outcomes:	1. Students will be able to Identify and test basic electronic components like Resistor, Capacitors, Inductors, Diodes and Transistors. 2. Students will be able to effectively use standard laboratory instruments such as Multi-meters, Power supplies, Function generators and CROs for the measurement of various electronics parameters. 3. Students will be able to implement and analyze analog circuits using various network theorems such Ohm's law, Kirchhoff's voltage and current law, Superposition Theorem, Voltage divider Theorem, Thevenin's Theorem, and Norton Theorem.
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No	Title of Practical	Weightage
1.	Study of Multimeter and Power Supply.	100%
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	• Direct Teaching through Chalk-Walk and Talk. • Online and ICT enabled teaching. • Tutorials. • Group discussion. • Problem solving. • Question-Answer and Discussion led by teacher/students. • Literature review. • Inquiry Based Learning.
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Evaluation Pattern (Internal / External Examinations)		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Continuous Assessment in the form of Internal Practical Test, Quizzes, Assignments, Active learning, Viva-voce, Attendance (As per NEP Guideline)	50%
2.	University examination	50%

Suggested References:	
Sr. No.	References
1.	Basic Electronics and Linear Circuits, By Bhargava, Kulshreshtha and Gupta. McGraw Hill Education
2.	Electrical Engineering Fundamentals, By Vincent Del Toro, Prentice Hall of India.
On-line resources to be used if available as reference material	



**Bachelor of Science
Electronics
Semester: I**

Course Code	UAS1SEELE01	Title of the Course	Fundamentals of Computer Hardware-1.
Total Credits of the Course	2	Hours per Week	2

Learning Objectives:	The course is to make the students understand 1. Computer organizations and its fundamentals. 2. Various primary and secondary storage devices
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Course Outcomes	Having completion of this course, the learner will be able to do 1. Understand the constituents of the modern computer systems. 2. Understand basic organizations of computer, primary and secondary storage.
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Unit	Description	Weightage
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	• Direct Teaching through Chalk-Walk and Talk. • Online and ICT enabled teaching. • Tutorials. • Group discussion. • Problem solving. • Question-Answer and Discussion led by teacher/students. • Literature review.
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Vitthalbhai Patel & Rajratna P. T. Patel Science College**(Autonomous)****(Reaccredited with 'A' Grade by NAAC (CGPA 3.14)****Affiliated to SARDAR PATEL UNIVERSITY****Vallabh Vidyanagar, Gujarat****Syllabus effective from the Academic Year 2026-2027**

Evaluation Pattern (Internal / External Examinations)		
Sr. No.	Details of the Evaluation	Weightage
1.	Internal Continuous Assessment in the form of Internal Written Test, Quizzes, Assignments, Active learning, Viva-voce, Seminars, Attendance (As per NEP Guideline)	50%
2.	University examination	50%

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	