



**B.Sc. Electronics Semester: III
(Major)**

Course Code	US03MAELE01	Title of the Course	Transistor Circuits.
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	The course is to make the students understand the fundamentals of Transistor, their characteristics, biasing and applications as an amplifier and oscillators.
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Course Content		
Unit	Description	Weightage In %
1.	Transistors: Structure of Transistor, Working, Transistor Amplifying Action, Configurations, Input and Output characteristics of CB, CE and CC configurations. Comparison of three configurations.	25
2.	Transistor Biasing: Basic CE amplifier circuit, DC Load Line, Why bias a transistor?, Selection of operating point, Need for Bias Stabilization, Requirements of Biasing circuit, Different Biasing circuits, Fixed Bias circuit, Collector to base bias Circuit, Bias Circuit with Emitter Resistor, Voltage divider Biasing Circuit. Emitter Bias Circuit.	25
3	Small Signal Amplifiers: Single stage transistor Amplifier, Graphical Method, Equivalent circuit, h Parameters equivalent circuit, Amplifier analysis, Multistage Amplifiers, Gain of multistage amplifier, RC coupled, Transformer coupled and Direct coupled amplifier, frequency response	25
4	Feed back: Concept of Feedback in amplifier, Types of feedback, voltage gain of feedback amplifier, advantages of negative feedback, amplifier circuit with negative feedback. Oscillators: classification of oscillators, positive feedback amplifier as an oscillator, LC oscillator, RC oscillator.	25

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%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Understand the construction of transistors their characteristics, various configurations and parameters in different modes.
2.	Understand biasing a transistor for various applications.
3.	Understand the transistor as small signal amplifier and their analysis.
4.	Understand the effect of Positive and Negative feedback on the transistors circuits.

Suggested References:	
Sr. No.	References
1.	Basic Electronics and Linear Circuits By Bhargava, Kulshreshtha and Gupta.
2.	Electronics Devices and Circuits By David A. Bell.

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





B.Sc. Electronics Semester: III
(Major)

Course Code	US03MAELE02	Title of the Course	Digital Electronics – 1
Total Credits of the Course	4	Hours per Week	4

Course Objectives:	The course is to make the students understand the fundamentals of Transistor, their characteristics, biasing and applications as an amplifier and oscillators.
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Course Content		
Unit	Description	Weightage In %
1.	Numbers System: Various Number systems: Decimal, Binary, Octal and Hexadecimal. Inter conversion and arithmetic, Representation of signed numbers using 1's and 2's compliment method,	25
2.	Binary Codes: Weighted and non weighted codes, BCD codes, BCD arithmetic, Excess-3 code, Excess-3 arithmetic, Gray code, Code Conversion, Binary to Grey, Grey to Binary, Alphanumeric codes: ASCII codes, EBCDIC code.	25
3	Logic gates: Basic Gates: AND Gate, OR Gate, NOT Gate, Universal Gates: NAND Gate, NOR Gate, XOR and XNOR Gates. Boolean Algebra: Logic operations, AXIOIMS and Laws of Boolean Algebra. Demorgan's theorems. Reduction of Boolean Expression.	25
4	Combinational circuits: Half and Full Adders, Half and Full Subtractor, Parallel Binary Adder, Look Ahead Carry Adder, Two's complement addition and Subtraction using parallel adders, Serial adders, BCD adders, Binary multipliers	25

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%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Understand the construction of transistors their characteristics, various configurations and parameters in different modes.
2.	Understand biasing a transistor for various applications.
3.	Understand the transistor as small signal amplifier and their analysis.
4.	Understand the effect of Positive and Negative feedback on the transistors circuits.

Suggested References:	
Sr. No.	References
1.	Basic Electronics and Linear Circuits By Bhargava, Kulshreshtha and Gupta.
2.	Electronics Devices and Circuits By David A. Bell.

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**B.Sc. Electronics Semester: III
(Major) Practicals**

Course Code	US03MAELE03	Title of the Course	Electronics Practicals.
Total Credits of the Course	4	Hours per Week	8

Course Objectives:	
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Part -1

Course Content		
No	Title of Practical	
1.	Study of Transistor fixed bias circuit with and without emitter resistor	
2.	Study of Transistor collector to base bias circuit	
3.	Study of Transistor potential divider bias circuit	
4.	NPN transistor Characteristics	
5.	Voltage gain of an amplifier	
6.	Single stage CE amplifier frequency response	
7.	Negative feedback amplifier	
8.	Phase shift oscillator	
9.	Wein bridge oscillator	
10.	Hartley oscillator	
11.	Colpitts oscillator	
	Other experiments based on Theory.	





Part -2

Course Content		
No	Title of Practical	
1.	Logic gates using discreet components	
2.	Logic gates using ICs	
3.	Half and full adder	
4.	Half and full Subtractor	
5.	Applications of X-OR, X – NOR gate	
6.	Reduction of Boolean expression	
7.	Other experiments based on Theory.	

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%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Helps to understand the various biasing circuits of transistors circuit.
2.	Make students understand characteristics of transistor and its application as an amplifier.
3.	Helps the student to understand positive and negative feedback effect in transistorised circuit.





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





**B.Sc. Electronics Semester: III
(Inter Disciplinary)**

Course Code	US03IDELE01	Title of the Course	Active Electronic Components.
Total Credits of the Course	2	Hours per Week	2

Course Objectives:	The course is to make the students understand the fundamentals of PN junction Diodes, other special diodes and DC power supplies.
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Course Content		
Unit	Description	Weightage In %
1.	Diodes: PN Junction theory, Forward Biased PN junction, Reverse Biased PN junction, VI characteristics of PN Junction diode. Special type Diodes: Zener Diode: Characteristics, Varactor diode, Operation and characteristics, Tunnel diode, Operation and Characteristics, Schottky diode, PIN diode, Light Emitting diode, Photo diode, Solar Cells.	50
2.	DC Power Supplies: Block Diagram of Power supply. Rectifiers: Half wave, Centre tapped Full wave and Bridge type Full wave rectifier. Filters: Series Inductors, shunt capacitor, LC Filter and PI filter. Regulators: Zener diode as Voltage regulator	50

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%





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

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| 1. | Helps to understand the various types of PN junction diodes and to analyze their simple circuit. |
| 2. | Make students understand various power supply circuits and their troubleshooting. |

Suggested References:

Sr. No.	References
1.	Electronics Devices and Circuits By David A. Bell. (5 th Edition)
2.	Basic Electronics and Linear Circuits By Bhargava, Kulshreshtha and Gupta.

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

On-line Resources





**B.Sc. Electronics Semester: III
(Inter Disciplinary) Practicals**

Course Code	US03IDELE02	Title of the Course	Electronics Practicals.
Total Credits of the Course	2	Hours per Week	4

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

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.	Zener diode as Voltage regulator.	
7.	Clipping Circuit using Zener Diode.	
8.	Other experiments based on Theory.	

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%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Helps to understand the various active electronics components.
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.

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**B.Sc. Electronics Semester: III
(Skill Enhancement)**

Course Code	US03SEELE01	Title of the Course	Fundamentals of Computer Hardware-3.
Total Credits of the Course	2	Hours per Week	2

Course Objectives:	The course is to make the students understand the basic of the operating systems and networking of computers.
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Course Content		
Unit	Description	Weightage In %
1.	Operating System Basics: Types of operating system: Real time OS, Single user / Single tasking OS, Single user / Multitasking OS, Multi user / Multitasking OS, Providing a user interface, Graphical interface, Command line interfaces, Running programs, Sharing information, Enhancing an OS with utility software, Backup utilities, Anti Virus, Fire wall, Screen Savers.	50
2.	Networks: Use of Networks, Simultaneous Access, Shared Peripherals Devices, Personal Communications, Easier Data backups, Common types of Networks; Local Area Networks, Wide Area Networks, Hybrid Networks, Campus Area Networks, metropolitan Area Networks, Home Area Networks Network Structures: server based Networks, Client / server Networks, Peer to Peer Networks, Network Topologies and Protocols. Network Media: Wire based and Wireless media.	50

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%

Course Outcomes: Having completed this course, the learner will be able to	
1.	Understand the constituents of the modern Operating system.
2.	Make students understand basic organizations of computer operating systems and computer communication networks.

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

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

