MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

UG COURSES – AFFILIATED COLLEGES

B.Sc., ELECTRONICS & COMMUNICATION

(Choice Based Credit System)

(With effect from the academic year 2020-2021onwards)

Semester (1)	**Part I/II/ III/ IV/V** (2)	**Sub No** (3)	**Subject status** (4)	**Subject Title** (5)	**Con--tact Hrs/ week** (6)	**C Credits** (7)
I	I	1	Language	Tamil/Other Language	6	4
	II	2	Language	Communicative English	6	4
	III	3	Core-I	Basic Electronic Devices	4	4
	III	4	Major Practical-I	Basic Electronic Devices Lab	3	2
	III	5	Add on Major (Mandatory	Professional English for Physical Sciences - I	4	4
	III	6	Allied-I	Basic Electronics	3	3
	III	7	Allied Practical-I	Basic Electronics Lab	2	2
	IV	8	Common	Environmental studies	2	2
				Subtotal	**30**	**25**
II	I	9	Language	Tamil/Other Language	6	4
	II	10	Language	English	6	4
	III	11	Core-II	Digital Electronics	4	4
	III	12	Major Practical-II	Digital Electronics Lab	3	2
	III	13	Add on Major (Mandatory)	Professional English for Physical Sciences - II	4	4
	III	14	Allied-II	Introduction to Digital Electronics	3	3
	III	15	Allied Practical-II	Digital Electronic Circuits Lab	2	2
	IV	16	Common	Value Based Education / சமூகஒழுக்கங்களும் பண்பாட்டு விழுமியங்களும் / Social Harmony	2	2
				Subtotal	**30**	**25**

BASIC ELECTRONIC DEVICES

LTPC
0204

Objective: To learn about the various Electronic devices

UNIT I

Types of resistor – color code –Construction of various types of resistors (carbon Composition, carbonfilm, wire-wound etc.) – power ratings- Capacitors (ceramic, mica polystyrene electrolytic etc.) – fixed and variable capacitors **(10L)**

UNIT II

Atomic structure Bohr atom model – energy levels -energy bands –important energy band in solids- classification of solids and energy bands – forbidden Energy gap – intrinsic and extrinsic semiconductors P type and N type semiconductors– majority and minority carriers **(12L)**

UNIT III

PN junction- Biasing a PN junction – forward and reverse biasing – PN junction diode: Characteristics -static and dynamic resistance - Diode Rectifiers: Half wave and Full wave rectifier – Bridge rectifier – clippers and clampers - Zener diode –Characteristics-voltage regulation using zener diode **(12L)**

UNIT IV

Bipolar transistor – UJT – Common Base, Common Emitter & Common Collector configurations and their characteristics – load line – operating point – cut off and saturation regions – transistor biasing methods -Transistor as switch, Amplifier– SCR **(10L)**

UNIT V

FET Constructional features-working Principle, features and characteristics – JFET and MOSFET and their characteristics – enhancement and depletion type **(10L)**

(Total: 54L)

TEXT BOOK:

1. V.K.Mehta, “Principles of Electronics”, S.Chand & Co
2. B.L.Theraja, “Basic solid state Electronics”, S.Chand & Co

BASIC ELECTRONIC DEVICES LAB

LTPC

0032

1. Characteristics of PN Junction diode
2. Characteristics of Zener diode
3. Transistor Characteristics – Common base
4. Transistor Characteristics – Common emitter
5. Transistor Characteristics – Common collector
6. Measurement of stability factor of self biasing method
7. Measurement of stability factor of fixed biasing method
8. FET Characteristics
9. Photoconductivity of LDR
10. Characteristics of Photo diode
11. Characteristics of SCR
12. Characteristics of Photo transistor.

Allied Electronics& Communication for other Major Students

BASIC ELECTRONICS

LTPC
0303

UNIT I

Semiconductor Basics: Introduction to semiconductor materials, intrinsic & extrinsic semiconductors. P type semiconductor,N type semiconductor p-n junction diode

UNIT II

Diode Circuits: clipper circuits, clamping circuits. Half wave rectifier, Center tapped and bridge full wave rectifiers, DC power supply: Block diagram of a power supply, Zener diode as voltage regulator.

UNIT III

The BJT: Basic transistor action, Transistor configurations: Common Base (CB), Common Emitter (CE) and Common Collector (CC) configuration, UJT: construction, working

UNIT IV

Feedback Amplifiers: Concept of feedback, negative and positive feedback, Positive feedback: Barkhausen criteria for oscillations, Study of Hartley,Colpitts oscillator and Crystal oscillator.

UNIT V

Junction Field Effect Transistor (JFET): Construction of JFET, Metal Oxide Field Effect Transistor (MOSFET): Basic Construction of MOSFET and working, enhancement and depletion modes.

TEXT BOOK:

Basic and Applied Electronics-T.K Bandyopadhyay, Books and Allied Pvt Ltd (2002)

BOOKS FOR REFERENCE:

1. V.K.Mehta, “Principles of Electronics”, S.Chand & Co

2. B.L.Theraja, “Basic solid state Electronics”, S.Chand &Co

3. R. L. Boylestad, L. Nashelsky, Electronic Devices and Circuit Theory, Pearson Education (2006).

4. N Bhargava, D C Kulshreshtha and S C Gupta, Basic Electronics and linear circuits, Tata McGraw-Hill (2007)

5. J. Millman and C. Halkias, Integrated Electronics, Tata McGraw Hill (2001).

6. David A. Bell, Electronic Devices & Circuits, Oxford University Press, Fifth edition

7. Mottershed, Electronic Devices, PHI Publication, 1st Edition.

MSU/ 2020-21 / UG-Colleges /Part-III (B.Sc. Electronics & Communication) / Semester – I / Allied Practical -1

Allied Practical for other major students

BASIC ELECTRONICS LAB

LTPC
0022

1. Characteristics of PN diode
2. Characteristics of Zener diode
3. Transistor Characteristics – Common base
4. Transistor Characteristics – Common emitter
5. Transistor Characteristics – Common collector
6. Measurement of stability factor of self biasing method
7. Measurement of stability factor of fixed biasing method
8. FET Characteristics
9. Photoconductivity of LDR
10. Characteristics of Photo diode
11. Characteristics of SCR
12. Characteristics of Photo transistor

MSU/ 2020-21 / UG-Colleges /Part-III (B.Sc. Electronics & Communication) /
Semester – II / Core – 2

DIGITAL ELECTRONICS

LTPC
0204

UNIT I

Number System and Codes: Decimal, Binary, Octal and Hexadecimal number systems, base conversions. Representation of signed and unsigned numbers, BCD code. Binary, octal and hexadecimal-,BCD-Excess3,graycode-Alphanumeric codes.

UNIT II

Digital Logic families, Truth Tables of OR, AND, NOT, NOR, NAND, EXOR, Universal Gates, Basic postulates and fundamental theorems of Boolean algebra. Demorgan's Theorem. Karnaugh Maps: Two, three, four variable K-Map

UNIT III

Arithmetic Circuits: Binary Addition. Half and Full Adder. Half and Full Subtractor, Binary Adder/Subtractor. Multiplexers, De-multiplexers, Decoders, Encoders. Parity checker – parity generators– code converters

UNIT IV

Latches, Flip-flops - SR, JK, D, T, and Master-Slave -Edge triggering – Level Triggering Asynchronous Ripple or serial counter – Asynchronous Up/Down counter - Synchronous counters – Synchronous Up/Down counters – Programmable counters – Modulo–n counter,

UNIT V

Registers – shift registers - Universal shift registers – Shift register counters – Ring counter – Shift counters

Memory Devices Classification of memories – ROM - ROM organization - PROM – EPROM – EEPROM – EAPROM, RAM – RAM organization – Static RAM Cell

BOOKS FOR REFERENCE:

1. Digital Principles & Applications – Albert Paul Malvino & Leach
2. Digital Fundamentals – Thomas L. Floyd – Prentice Hall
3. Digital Electronics-an introduction to Theory and Practice – William H.Gothmann Prentice Hall
4. Digital Practice using Integrated Circuits – R. P. Jain and Anand
5. Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.
6. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
7. Digital Systems: Principles & Applications, R.J.Tocci, N.S.Widmer, 2001, PHI Learning.
8. Digital Principles, R. L. Tokheim, Schaum's Outline Series, Tata McGraw-Hill (1994)

MSU/ 2020-21 / UG-Colleges /Part-III (B.Sc. Electronics & Communication) /
Semester – II / Major Practical - II

DIGITAL ELECTRONICS LAB

LTPC

0032

1. Study of AND, OR, NOT, NAND, NOR and XOR gates using IC
2. Designing of all the logic gates using NAND gate IC
3. Designing of all the logic gates using NOR gate IC
4. Verification of Demorgan's theorems
5. Construction of gates using discrete components
6. Code conversion
7. Half adder and Full adder
8. Half subtractor and Full subtractor
9. Multiplexer and De-Multiplexer
10. Encoder and Decoder
11. Study of Flip flops
12. Shift register
13. Ripple counter

MSU/ 2020-21 / UG-Colleges /Part-III (B.Sc. Electronics & Communication) / Semester – II / Allied - II

Allied Electronics & Communication for other Major Students

INTRODUCTION TO DIGITAL ELECTRONICS

LTPC
0303

UNIT I

Number System and Codes: Decimal, Binary, Octal and Hexadecimal number systems, base conversions. BCD code. Binary, octal and hexadecimal arithmetic.

UNIT II

Digital Logic families, Truth Tables of OR, AND, NOT, NOR, NAND, EXOR,gates , Universal Gates, Basic postulates and fundamental theorems of Boolean algebra. Demorgan's Theorem.

UNIT III

Arithmetic Circuits: Binary Addition. Half and Full Adder. Half and Full Subtractor, Multiplexers, De-multiplexers, Decoders, Encoders. Parity checker– code converters

UNIT IV

Latches and Flip flops , S-R Flip flop, J-K Flip flop, T and D type Flip flops, Counters (synchronous and asynchronous, ring and modulo- n counter Registers – shift registers. **UNIT V**

Memory Devices Classification of memories – ROM PROM – EPROM – EEPROM – EAPROM, RAM – Static RAM Cell- Bipolar RAM cell – MOSFET RAM cell – Dynamic RAM cell Programmable Logic Devices – Programmable Logic Array (PLA) - Programmable Array Logic (PAL) – Field Programmable Gate Arrays (FPGA)

BOOKS FOR REFERENCE:

1. Digital Principles & Applications – Albert Paul Malvino & Leach
2. Digital Fundamentals – Thomas L. Floyd – Prentice Hall
3. Digital Electronics-an introduction to Theory and Practice - William H.Gothmann Prentice Hall
4. Digital Practice using Integrated Circuits – R. P. Jain and Anand
5. Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.
6. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
7. Digital Systems: Principles & Applications, R.J.Tocci, N.S.Widmer, 2001, PHI Learning.
8. Digital Principles, R. L. Tokheim, Schaum's Outline Series, Tata McGraw- Hill, (1994)

MSU/ 2020-21 / UG-Colleges /Part-III (B.Sc. Electronics & Communication) / Semester – II / Allied Practical - II

Allied Practical for other major students

DIGITAL ELECTRONIC CIRCUITS LAB

LTPC

0022

1. Study of AND, OR, NOT, NAND, NOR and XOR gates using IC
2. Designing of all the logic gates using NAND gate IC
3. Designing of all the logic gates using NOR gate IC
4. Verification of Demorgan's theorems
5. Construction of gates using discrete components
6. Code conversion
7. Half adder and Full adder
8. Half subtractor and Full subtractor
9. Multiplexer and De-Multiplexer
10. Encoder and Decoder
11. Study of Flip flops
12. Shift register
13. Ripple counter