MANONMANIAM SUNDARANAR UNIVERSITY

TIRUNELVELI

B.Sc. ELECTRONICS

SYLLABUS

FROM THE ACADEMIC YEAR

2026-2027 and onwards

MANONMANIAM SUNDARANAR UNIVERSITY, TIRUNELVELI

B.Sc., Electronics

under CBCS with effect from the academic year 2026-27 and onwards

Learning Outcome based Curriculum

Vision of the University

To provide quality education to reach the un-reached

Mission of the University

- To conduct research, teaching and outreach progrmmes to improve conditions of human living.
- To create an academic environment that honours women and men of all races, caste, creed, cultures, and an atmosphere that values intellectual curiosity, pursuit of knowledge, academic freedom and integrity.
- To offer a wide variety of off-campus educational and training programs, including the use of information technology, to individuals and groups.
- To develop partnership with industries and government so as to improve the quality of the workplace and to serve as catalyst for economic and cultural development.
- To provide quality / inclusive education, especially for the rural and unreached segments of economically downtrodden students including women,socially oppressed and differently abled.

PREAMBLE

The Bachelor of Science (B.Sc.) Electronics Programme of ManonmaniamSundaranar University is designed to impart comprehensive knowledge and practical skills in the field of Electronics, catering to the growing demands of science, technology, and industry. The programme aims to provide a strong foundation in electronic devices, circuits, communication systems, microprocessors, embedded systems, instrumentation, and emerging technologies, enabling students to understand and apply electronic principles in real-world situations.

In alignment with the vision of the University and the National Education Policy (NEP), the curriculum emphasizes outcome-based education, multidisciplinary learning, skill enhancement, and employability. The programme integrates theoretical concepts with laboratory training, project work, internships, and value-added courses to foster analytical thinking, problem-solving abilities, innovation, and entrepreneurship among students.

The curriculum is structured to equip learners with the competencies required for higher education, research, and professional careers in electronics, information technology, telecommunications, automation, manufacturing industries, and allied sectors. It also promotes scientific temper, ethical values, environmental consciousness, and social responsibility, thereby contributing to the holistic development of students.

Through a balanced combination of academic rigor and practical exposure, the B.Sc. Electronics Programme seeks to produce competent graduates capable of meeting the challenges of a rapidly evolving technological world and contributing effectively to national development and societal well-being.

Eligibility for Admission

A pass in Higher Secondary Examination With Mathematics, Physics, Chemistry as subjects of study or any other examination accepted as equivalent there to by the Syndicate or a pass in I or II Group or Vocational Group in Higher Secondary Examination with Mathematics or Physics or Electronic as the subjects of study. Or A pass in Higher Secondary Examination with Mechanist or Electrical Motor Winding or Electronics.

Duration of the Program:

The duration of the program is three academic years comprising of six semesters with two semesters in each academic year. Examinations will be conducted at the end of each semester for the respective courses.

Medium of Instructions and Examinations:

The medium of instructions and examinations for the courses of Part I and Part II shall be in the languages concerned. For the courses of Part III and Part IV, the medium of instructions and examinations shall be in English.

Examination

The regulations for examination, passing minimum in each course and classification of successful candidates and award of ranks are at par with the regulations for other undergraduate science programs of the University.

PROGRAMME EDUCATIONAL OUTCOMES(PEO)

InalignmentwiththeVisionandMissionoftheUniversity,thefollowinghavebeendefinedas the PEO for the graduates.

PEO1: Developing strong positive attitude to learn independently the concepts in the field of study.

PEO2: Ensuring confidence among the learners to apply the knowledge and skills gained to solve real life issues.

PEO3: Habituating ethical values among the learners to succeed in personal and professional life.

PROGRAMME OUTCOMES (POs):

AfterthesuccessfulcompletionofB.Sc. Electronics Programme from the University, the learner should be able to

- **PO1: Knowledge Comprehension and Communication:** The ability to comprehend acquired knowledge and effectively communicates it to others.
- **PO2: Analysis and Problem Solving:** The capability to analyze and compare factual data or situations to critically evaluate them and find solutions to problems.
- **PO3: Scientific Application:** The ability to apply learned theories and philosophies to solve problems in a scientific manner.
- **PO4: Reflective Thinking and Lifelong Learning:** The habit of thinking reflectively on previous activities and engaging in a self-directed, lifelong learning process.
- **PO5: Multicultural and Ethical Awareness:** Understanding multicultural existence and identifying ways to maintain moral and ethical values in both personal and professional life.
- **PO6: Digital Literacy:** Explore through multiple sources and get exposed to the digital technology.
- **PO7: Teamwork and Leadership:** Act as a responsible member in teams and practice leadership qualities.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

AfterthesuccessfulcompletionofB.Sc. Electronics Programme from the University, the learner should be able to

PSO1: Electronics Knowledge and Understanding

Demonstrate comprehensive knowledge of electronic devices, circuits, communication systems, instrumentation, and embedded systems, and effectively communicate electronic concepts and applications.

PSO2: Circuit Analysis and Problem Solving

Analyze electronic circuits and systems, identify faults, and develop appropriate solutions using scientific and engineering principles.

PSO3: Practical and Scientific Application

Apply theoretical concepts through laboratory experiments, simulations, and projects for the design, testing, and implementation of electronic systems.

PSO4: Independent Learning and Technological Adaptation

Engage in self-directed learning to acquire knowledge of emerging technologies and adapt to advancements in electronics and allied disciplines.

PSO5: Professional Ethics and Social Responsibility

Demonstrate ethical practices, environmental awareness, and social responsibility while developing and deploying electronic technologies.

PSO6: Digital and Computational Competence

Utilize modern software tools, programming techniques, simulation packages, and digital resources for electronics design, analysis, and information management.

PSO7: Teamwork, Leadership, and Employability

Work effectively as an individual and as a member of a team, exhibit leadership qualities, and apply entrepreneurial and professional skills for employment, higher studies, and research in electronics and related fields.

Eligibility for Admission

A pass in Higher Secondary Examination With Mathematics, Physics, Chemistry as subjects of study or any other examination accepted as equivalent there to by the Syndicate or a pass in I or II Group or Vocational Group in Higher Secondary Examination with Mathematics or Physics or Electronic as the subjects of study. Or A pass in Higher Secondary Examination with Mechanist or Electrical Motor Winding or Electronics.

Duration of the Program:

The duration of the program is three academic years comprising of six semesters with two semesters in each academic year. Examinations will be conducted at the end of each semester for the respective courses.

Medium of Instructions and Examinations:

The medium of instructions and examinations for the courses of Part I and Part II shall be in the languages concerned. For the courses of Part III and Part IV, the medium of instructions and examinations shall be in English.

Examination

The regulations for examination, passing minimum in each course and classification of successful candidates and award of ranks are at par with the regulations for other undergraduate science programs of the University.

MEASUREMENT OF ATTAINMENT OF COURSE OUTCOME

The Course Outcomes (COs) are measured through the performance of learners by direct and indirect assessment methods for that particular course.

i. **Internal Assessment (25 Marks)**

For UG

Tests – 20 Marks

Seminar / Attention (Participation) in Class – 5 Marks;

ii. **Semester End Examinations (75 Marks)**

Written exams, Practical, Project report, and Comprehensive Viva Voce

Note: In both Internal and Semester End Examinations

For UG - Lower Order Thinking (K1, K2, & K3) – 60 % in each part

Higher Order Thinking (K4, K5, & K6) – 40 % in each part

Model Question Paper

(..Pages) Reg.No…

Code No: 10815 E Sub. Code: FSEL 11/ FSES 11

B.Sc(CBCS) DEGREE EXAMINATION,
November - 2026
Electronics /Electronics and Communication
(For those admitted in June 2026 onwards)
Core: Electronic Devices

Time: 3 hours Maximum: 75 marks

Course Outcome	Bloom's K-level	Qn. No.	PART – A 10 X 1= 10 Marks Answer ALL Questions Choose the BEST Answers
CO1	K1	1.	The Zener diode is used as _____. (a) an amplifier(b) a rectifier (c) a oscillator (d) a voltage regulator
CO1	K1	2.	Which of the following is a characteristic of a reverse-biased p-n junction? (a) Very narrow depletion region(b) Large current flow (c) Almost no current (d) Very low resistance
CO2	K2	3.	The number of depletion layer in a transistor is a _____. (a) two (b) three (c) four (d) five
CO2	K2	4.	Which one is disadvantage of impedance matching? (a) gives low power output (b) gives distorted output (c) requires a transformer (d) generate electrical power
CO3	K3		The gate voltage in a JFET at which drain current becomes zero is called _____

		5.	voltage. (a) saturation (b)pinch-off (c) active (d) cut-off
CO3	K3	6.	How many terminal are there in a unijunction transistor? (a) 1 (b) 2 (c) 3 (d) 4
CO4	K4	7.	The three terminal of SCR are named as _____ . (a) anode,cathode ,gate (b) emitter,collector,base (c) drain,source,gate (d) MT1,MT2,gate7777
CO4	K4	8.	Which of the following is the fastest switching device ? (a) JFET (b) BJT (c) MOSFET (d) Triode
CO5	K5	9.	_____is used to detect the optical signal (a) photo diode (b) Zener diode (c) PIN diode (d) GUNN diode
C05	K5	10.	Which is the purpose of LCD on basic operator panel in D.C drive_____? (a) Indicate the fault (b) Display the speed (c) Monitor the parameter (d) Display availability of supply
Course Outcome	Bloom's K-level	Qn. No.	PART – B 5 X 5 = 25 Marks Answer ALL Questions choosing either (a) or (b) Each answer should not exceed 250 words
CO1	K1	11a.	Describe the PN junction diode.
CO1	K1	11b.	Note in detail about the Zener diode.
CO2	K2	12a.	Write a short note on the CB Configuration.
CO2	K2	12b.	Discuss about the input impedance
CO3	K3	13a.	What is meaning of FET?
CO3	K3	13b.	List out any two applications of FET Write a note on equivalent circuit of UJT.
CO4	K4	14a.	Evaluation between SCR and Transistors.
CO4	K4	14b.	Explain about the characteristics of N-channel MOSFET.
CO5	K5	15a.	Define: Photo diode.
C05	K5	15b.	Give details about the photo transistor.

Course Outcome	Bloom's K-level	Qn. No	PART – C 5 X 8 = 40 Marks Answer ALL Questions choosing either (a) or (b) Each answer should not exceed 600 words
CO1	K1	16a.	Visualize the characteristics of PN- junction with neat and diagram.
CO1	K1	16b.	Write in detail about the working principle of zener diode with neat sketch.
CO2	K2	17a.	Explain the following terms
CO2	K2	17b.	(a) NPN transistor (b) PNP transistor. Summarize about the CE configuration with necessary diagram.
CO3	K3	18a.	Explain about the construction and operation of JFET and with neat diagram.
CO3	K3	18b.	Construe about how to use the UJT as a Relaxation oscillator and its operation with neat sketch.
CO4	K4	19a.	Analyse of the enhancement and depletion mode MOSFET with neat diagram.
CO4	K4	19b.	Investigate how to connect the SCR as switch and its application with neat diagram.

CO5	K5	20a.	Evaluate the working of LDR with neat sketch.
C05	K5	20b.	Discuss in elaborate about the 7 segment LED with neat diagram

Choice Based Credit System (CBCS), Learning Outcomes Based Curriculum Framework (LOCF) Guideline Based Credit and Hours Distribution System For B.Sc (Electronics)

Semester I

Part	Specification	Courses	Credit	Hours per Week (L/T/P)
Part I	Language	Tamil	3	6
Part II	Language	English	3	6
Part III	Core 1	Basic Electronic Devices	5	5
	Core 2	Basic electronics Devices Lab	3	4
	Elective Course 1 (Generic)	Introduction of C Language	5	5
	SEC 1	Programming in C Lab	2	2
	Foundation Course	Foundation for Electronics and Computers	2	2
	Total		23	30

Semester II

Part	Specification	Courses	Credit	Hours per Week (L/T/P)
Part I	Language	Language – Tamil	3	6
Part II	Language	English	3	4
Part III	Core 3	Digital Electronics	5	5
	Core 4	Digital Electronics Lab	3	4
	Elective Course 2 (Generic)	Introduction ofPython Language	5	5
	SEC 2	Programming in Python Lab	1	2
	SEC 3	Computer Hardware	1	2
	NaanMudhalvan	As per TN Govt. Guidelines	2	2
	Total		23	30

Semester III

Part	Specification	Courses	Credit	Hours per Week (L/T/P)
Part I	Language	Tamil	3	6
Part II	Language	English	3	6
Part III	Core 5	Electronic Circuits	4	4
	Core 6	Electronic and Electrical Circuits Lab	4	4
	Elective Course 3 (Generic)	Mathematics for Electronics I / Electronics for Competitive Exams	4	4
	SEC 4	Applied Electrical Circuits	2	2
	Naan Mudhalvan	As per TN Govt. Guidelines	2	2
Part IV	EVS	Environmental Studies	2	2
	Total		24	30

Semester IV

Part	Specification	Courses	Credit	Hours per Week (L/T/P)
Part I	Language	Tamil	3	6
Part II	Language	English	3	6
Part III	Core 7	Linear Integrated Circuits	4	4
	Core 8	Linear Integrated Circuits Lab	4	4
	Elective Course 4 (Generic)	Mathematics for Electronics II / Consumer Electronic Appliances	4	4
	SEC 5	Electronic Measurements and Instrumentation	2	2
	Naan Mudhalvan	As per TN Govt. Guidelines	2	2
Part IV	VBE	Value Based Education	2	2
	Total		24	30

Semester V

Part	Specification	Courses	Credit	Hours per Week (L/T/P)
Part III	Core 9	Microprocessor and Microcontroller	4	5
	Core 10	Medical Electronics	4	5
	Core 11	Microprocessor and Microcontroller Lab	4	6
	Core 12	Mini Project	2	4
	Elective Course 5 (Domain Specific)	Communication Systems / Optical Display Devices	3	4
	Elective Course 6 (Domain Specific)	Electronic Troubleshooting / Mobile Communication	3	4
	Naan Mudhalvan	As per TN Govt. Guidelines	2	2
Part IV	Internship/ Industrial Visit/ Field Visit	Internship/ Industrial Visit/ Field Visit	1	-
	Total		23	30

Semester VI

Part	Specification	Courses	Credit	Hours per Week (L/T/P)
Part III	Core 13	Power Electronics	4	5
	Core 14	Embedded Systems and RTOs	4	5
	Core 15	Power Electronics and System Design Lab	4	6
	Core 16	Major Project	4	4
	Elective Course 7 (Domain Specific)	Internet of Things(IoT) and Applications / PCB Design	3	4
	Elective Course 8 (Domain Specific)	Artificial Intelligence / Optical Fibre Communication	3	4

	Naan Mudhalvan	As per TN Govt. Guidelines	2	2
Part V	Extension Activity	NSS/NCC/YRC	1	-
	Total		25	30

Credit Distribution for B.Sc., Electronics

S.No	Part	Course Details	Credit
1	**III**	Core	62
2		Elective Generic/ Discipline Specific Elective	30
3	**I &II**	Language & English (Lang – 4x3=12 Eng– 4x3=12)	24
4	**IV &V**	EVS(1x2)	2
5		Value Education(1x2)	2
6		Extension Activity(1x1)	1
7		• Skill Enhancement Course • Internship/Industrial Visit/Field Visit (1x1=1 credits) • Foundation Course • Naan Muthalvan	8 1 2 10
			142

Remarks: English Soft Skill Two Hours will be handled by English Teachers (4+2 = 6 hours for English).

B.Sc., Electronics

PSOs:

SEVEN Programme Specific Outcomes (PSO) in line with the POs proposed for the Postgraduate and Undergraduate programme.

Title of the course	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	Total Score
Basic Electronic Devices	2.25	3	2	1.25	0.5	1.25	0.5	10.75
Basic electronics Devices Lab	2.25	3	2.5	1.5	0.25	1.75	1	12.25
Introduction of C Language	2	2.5	2	1.5	0.25	3	1	12.25
Programming in C Lab	2	2.5	2.25	1.5	0.25	3	1	12.5
Foundation for Electronics and Computers	2.25	2.5	2	1.5	0.25	2	0.75	11.25
Digital Electronics	2.25	2.75	2	1.5	0.25	1.75	0.75	11.25
Digital Electronics Lab	2.25	2.75	2.5	1.5	0.25	1.75	1	12
Introduction of Python Language	2	2.5	2	1.5	0.25	3	1	12.25
Programming in Python Lab	2	2.5	2	1.5	0.25	3	1	12.25
Computer Hardware	2	2.5	2	1.5	0.25	3	1	12.25
Foundation in Electronics	2.25	2.75	2	1.5	0.25	1.75	0.75	11.25
Total score of all courses contributing to PSO	23.5	29.25	23.25	16.25	3	25.25	9.75	

Each Course has to address a minimum of 4 PSOs

Level of contribution of the Course towards attaining PSOs

0 – No Contribution 1 – Low Level 2 – Medium Level

3 – High Level

SEMESTER - I

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	BASIC ELECTRONIC DEVICES	**Core Course –1 (CC-1)**	**5**	**0**	**-**	**-**	**5**	**5**	**25**	**75**	**100**

Course Outcomes

	COs	On completion of this course, students can able to	RBT
	CO1	explain the construction, characteristics, operating principles, and applications of passive components, semiconductor materials, PN junction diodes, bipolar transistors, UJT, SCR, JFET, and MOSFET devices.	K1, K2
	CO2	apply the principles of semiconductor devices to analyze the operation of rectifiers, clippers, clampers, voltage regulators, transistor biasing circuits, amplifiers, switches, and FET-based circuits.	K3
	CO3	performance of diodes, BJTs, SCRs, JFETs, and MOSFETs under different operating conditions and compare their suitability for specific electronic applications.	K4
	CO4	evaluate the performance of electronicdevices and design simpleelectronic circuits using semiconductor components to meet specified functional requirements in practical applications.	K5,K6

UNIT	Details	No .of Hours
I	Type of resistors – color code –construction of various types of resistors (carbon composition, carbon film, wire-wound etc.)– power ratings-capacitors(ceramic, mica polystyreneelectrolytic)–fixed and variable capacitors	15

II	Atomic structure, Bohr‟ s atom model – energy levels -energy bands –classification of solids and energy bands – forbidden energy gap– intrinsic and extrinsic semiconductors, P type andN type semiconductors –majority and minority carriers	15
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	15
IV	Bipolar transistor – UJT – Common Base, Common Emitter & Common Collector configurations and their characteristics – transistor biasing methods- Transistor as switch, amplifier–SCR	15
V	FET Constructional features-working Principle, featuresandcharacteristics - JFET and MOSFET and their characteristics – enhancement and depletion type	15
	Total	75

Text Books	
1	V.K.Mehta, “Principles of electronics”, S.Chand&Co.,
2	B.L.Theraja,“Basic Solid-State Electronics”,S.Chand&Co.,
References Books	
1	SemiconductorPhysicsandDevices-BasicPrinciples|4th Edition.by**DonaldA. Neamen**(2021)
Web Resources	
1	https://www.electronics-tutorials.ws/diode/diode_1.html
2	https://www.electronicshub.org/types-of-semiconductor-devices/
3	https://www.britannica.com/technology/semiconductor-device

MAPPING of Cos with POs

CO-PO Mapping (Course Articulation Matrix)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	1	2	1	0	1	0
CO2	2	3	3	1	0	1	1
CO3	2	3	3	2	1	1	1
CO4	2	3	3	2	1	2	1
TotalScore	9	10	11	6	2	5	3

Level of Correlation between COs and POs

0 – No Correlation 1–Low 2–Medium 3–High

MAPPING of COs with PSOs

CO - PSO Mapping (Course Articulation Matrix)

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	1	0	0	1	1
CO2	2	3	2	1	0	1	0
CO3	2	3	2	2	1	1	0
CO4	2	3	3	2	1	2	1
TotalScore	9	11	8	5	2	5	2

Level of Correlation between COs and PSOs

0– No Correlation 1–Low 2–Medium 3–High

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	BASIC ELECTRONIC DEVICES LAB	**Core Course 2 - Practical 1 (CC-2)**	**-**	**-**	**4**	**-**	**3**	**4**	**50**	**50**	**100**

Course Outcomes

	Cos	On completion of this course, students can able to	RBT
	CO1	explain and describe the operating principles, characteristics, and behavior of semiconductor electronic devices such as PN junction diodes, Zener diodes, BJTs, FETs, UJT, SCR, LDR, photodiodes, and phototransistors.	K1, K2
	CO2	perform experiments and apply suitable laboratory procedures to obtain and measure the input/output characteristics and stability factors of various electronic devices and transistor biasing circuits.	K3
	CO3	analyze the experimental characteristics of semiconductor devices and transistor configurations to determine device parameters, compare performances, and interpret circuit behavior under different operating conditions.	K4
	CO4	evaluate the performance and stability of electronic device circuits and design suitable biasing and measurement circuits for practical electronic applications using appropriate semiconductor components.	K5,K6

UNIT	Details	No. of Hours	Course Objectives
I	PN Junction diode and Zener diode Characteristics	8	CO1
II	Bipolar Junction Transistor(BJT) Characteristics(Input and Output) – Common Base (CB);BJT Characteristics (Input and Output)– Common Emitter(CE); BJT Characteristics(Input and Output)–Common Collector (CC);	8	CO2
III	Measurement of stability factor of self-biasing method Measurement of stability factor of fixed-biasing method Field Effect Transistor (FET) characteristics	8	CO3
IV	Photoconductivity measurements of LDR, Photodiode characteristics, Phototransistor characteristics	8	CO4
V	UJT and SCR characteristics	8	CO5
	Total	40	
Text Books			
1	V.K.Mehta, "Principles of electronics",S.Chand&Co		
2	B.L.Theraja,"Basic Solid-state electronics",S.Chand&Co		
References Books			
1	Semiconductor Physics and Devices- Basic Principles, 4thEdition.by**DonaldA. Neamen**(2021)		
Web Resources			
1	https://www.electronics-tutorials.ws/diode/diode_1.html		
2	https://www.electronicshub.org/types-of-semiconductor-devices/		
3	https://www.britannica.com/technology/semiconductor-device		

Methods of Evaluation		
Internal Evaluation	Continuous Internal Assessment Test	50Marks
	Observation Work	
	Record Work	
	Attendance and Lab Participation	

External Evaluation	End Semester Examination	50Marks
	Total	100 Marks

MAPPING of COs with POs

CO - PO Mapping (Course Articulation Matrix)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	2	2	1	0	1	0
CO2	2	3	3	1	0	2	1
CO3	2	3	3	2	0	2	1
CO4	2	3	3	2	1	2	2
TotalScore	9	11	11	6	1	7	4

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

MAPPING of COs with PSOs

CO-PSO Mapping (Course Articulation Matrix)

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	1	1	0	1	0
CO2	2	3	3	1	0	2	1
CO3	2	3	3	2	0	2	1
CO4	2	3	3	2	1	2	2
TotalScore	9	11	10	6	1	7	4

Level of Correlation between COs and PSOs

0– No Correlation 1–Low 2–Medium 3–High

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	INTRODUCTION OF C LANGUAGE	**Elective– 1 (ELE-1)**	**0**	**5**	**-**	**-**	**5**	**5**	**25**	**75**	**100**
Course objectives											
	The main objectives of this course are to: • Understand the basic C programming language • Learn data structures and concepts • Know the statements of C-program • Understand functions, pointers and structures Use arrays, pointers and strings to the C-program										
Course Outcomes											
	COs	On completion of this course, students can able to									**RBT**
	CO1	explain the fundamentals of programming concepts, algorithms, flowcharts, C language syntax, data types, operators, control statements, functions, arrays, strings, pointers, structures, unions, and file handling concepts.									K1, K2
	CO2	apply C programming constructs such as operators, decision-making statements, looping structures, functions, arrays, strings, pointers, structures, and file operations to develop simple programs for solving computational problems.									K3
	CO3	analyze C programs by examining program logic, control flow, function interactions, array manipulations, pointer operations, structures, and file-processing techniques to identify and resolve programming issues.									K4
	CO4	evaluate and design efficient C programs using appropriate programming constructs, functions, data structures, pointers, structures, and file handling mechanisms to develop solutions for real-world applications.									K5,K6
UNIT	**Details**										**No .of Hours**

I	**INTRODUCTION**: Concept of Programming Languages -High Level, Low Level, Assembly Language – Concept of Algorithms and Flow Charts- **Language translators:**Assemblers, Compilers, Interpreters (Only concept and differences)	15
II	**DATA CONCEPTS**: Overview of C, Features of C fundamentals - Character Set, Identifiers, Keywords, Data Types, Constants, Variables, Operators - Arithmetic, Logical, Relational, Unary, Assignment, Conditional and Bitwise Operators–expressions	15
III	**STATEMENTS**: Structure of C Program - Library Functions – Data input and output, Compilation and Execution of C Programs - Control Statements - IF Statement, IF…ELSE Statement, Nesting of IF …Else Statement – Operator - Switch Statement - Loop Controls – FOR, WHILE, DO-WHILE Loops, Break - Continue, Exit, GO...TO Statement.	15
IV	**FUNCTIONS**: The Need of a Function - definition - User Defined and Library Function - Prototype of a Function - Calling of a function - Function Argument - Passing arguments to function - Return Values -Nesting of Function - main () - Command Line Argument - Recursion.	15
V	**ARRAYS AND STRINGS**: Arrays -Single and Multi- dimensional arrays, Declaration and Initialization of arrays and strings, pointers and one-dimensional arrays-Structures- Definition, declaration of structure variables, accessing structure members unions -Data files- opening and closing a data file, Creating a data file.	15
	Total	75
	Text Books	
1	E.Balaguruswami, Programming with C,TMH.	
2	Byron Gottfried, Programming with C, Schaum‟s Outline Series, TMH.	
	References Books	
1	Mahapatra, Thinkingin C,PHI.	
2	Brain W Kernighan and Dennis M Ritchie, The C Programming language, PHI	
3	Dennis &Ritchie:“ Programming in C”.	
	Web Resources	
1	www.cprogramming.com	
2	https://archive.nptel.ac.in/courses	

3	www.programmersheaven.com

MAPPING of Cos with POs

CO-PO Mapping (Course Articulation Matrix)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	1	1	1	0	2	0
CO2	2	3	3	1	0	3	1
CO3	2	3	2	2	0	3	1
CO4	2	3	3	2	1	3	2
TotalScore	9	10	9	6	1	11	4

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

MAPPING of COs with PSOs

CO-PSO Mapping (Course Articulation Matrix)

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	1	1	1	0	3	0
CO2	2	3	2	1	0	3	1
CO3	2	3	2	2	0	3	1
CO4	2	3	3	2	1	3	2
TotalScore	8	10	8	6	1	12	4

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	PROGRAMMIG IN C LAB (Skill enhancement course 1)	**- Practical (SEC – 1)**	**-**	**-**	**2**	**-**	**2**	**2**	**50**	**50**	**100**

Course Outcomes

	COs	On completion of this course, students can able to	RBT
	CO1	explain and demonstrate the fundamental concepts of C programming, including data types, operators, arrays, strings, functions, and basic problem-solving techniques.	K1, K2
	CO2	apply C programming constructs to develop programs for numerical computations, sorting, matrix operations, string processing, and recursion.	K3
	CO3	analyze programming problems and implement appropriate algorithms using C language features to obtain correct and efficient solutions.	K4
	CO4	design and evaluate C programs to solve practical computational problems involving mathematical, statistical, and data-processing applications.	K5,K6

UNIT	Details	No .of Hours
I	Temperature Conversion Fahrenheit to Degree Celsius and Solve and find all the possible roots of a Quadratic equation.	6
II	Sort a list of numbers in descending order and Matrix Multiplication	6
III	Check if a string is palindrome and Prepare a Mark sheet & also print the grade of the result	6
IV	Sort a list of names in alphabetic order and Find nCr using recursion	6
V	Calculate Std Deviation for a set of numbers and Evaluate the power series.	6
	Total	30

Text Books	
1	E.Balagurusamy ,“Programming in ANSI C” ,TMH
2	YashwantKanetkar,“ Let Us C ”, S.Chand&Co

References Books	
1	Computer Fundamentals and Introduction of C,ReemaTheraja
2	Programming with ANSI and Turbo C – AsokN.Kamthane, Pearson Education
Web Resources	
1	https://www.electronics-tutorials.ws/diode/diode_1.html
2	https://www.electronicshub.org/types-of-semiconductor-devices/
3	https://www.britannica.com/technology/semiconductor-device

MAPPING of Cos with POs

CO-PO Mapping (Course Articulation Matrix)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	1	1	1	0	2	0
CO2	2	3	3	1	0	3	1
CO3	2	3	3	2	0	3	1
CO4	2	3	3	2	1	3	2
TotalScore	9	10	10	6	1	11	4

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

MAPPING of COs with PSOs

CO-PSO Mapping (Course Articulation Matrix)

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	1	1	1	0	3	0
CO2	2	3	2	1	0	3	1
CO3	2	3	3	2	0	3	1
CO4	2	3	3	2	1	3	2
TotalScore	8	10	9	6	1	12	4

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	FOUNDATION OF ELECTRONICS & COMPUTERS (Skill enhancement FoundationCourse)	**SEC FC 1**	**2**	**-**	**-**	**-**	**2**	**2**	**25**	**75**	**100**

Course Outcomes

	COs	On completion of this course, students can able to	RBT
	CO1	explain the fundamental concepts of semiconductor materials, p–n junction diodes, transistor devices, feedback amplifiers, computer software, programming languages, and problem-solving techniques.	K1, K2
	CO2	apply the principles of semiconductor devices, rectifier circuits, voltage regulators, programming structures, algorithms, flowcharts, and pseudocode to solve simple electronics and computational problems.	K3
	CO3	analyze the operation and characteristics of diode circuits, transistor configurations, feedback systems, oscillators, software structures, and programming methodologies to interpret their functions and applications.	K4
	CO4	evaluate and design basic electronic and computational solutions using semiconductor devices, amplifier circuits, algorithms, flowcharts, and programming concepts for practical applications.	K5,K6

UNIT	Details	No .of Hours
I	**SEMICONDUCTOR BASICS:** Introduction to semiconductor materials, intrinsic&extrinsic semiconductors. p-type semiconductors, n-type semiconductors, p-n junction diode	6
II	**DIODE CIRCUITS:** Clipper, Clamping circuits, half wave and full wave rectifiers, center tapped and bridge rectifiers, Block diagram of DC power supply, Zener diode as voltage regulator	6
III	**TRANSISTORS AND FEEDBACK AMPLIFIERS:** BJT,FET, and MOSFET transistors action, Transistor configurations, Concept of feedback, negative and positive feedback, oscillators, Study of Hartley, Colpitts oscillators and crystal oscillator, IC, VLSI and ULSI	6
IV	**COMPUTER SOFTWARE &LANGUAGES:** i) Type of Software's – System Architecture ii) Machine Language – Assembly Language-High Level Language - Object Oriented Languages **PROGRAMMINGSTRUCTURE:** Modules and their function- Local and	6

	Global variables-Parameters-Return values-Sequential Logic Structure.	
V	**PROBLEM SOLVING CONCEPTS FORTHECOMPUTER:** Constant Variables - Data Types - Functions -Operators - Expressions and Equations - **Organizing the Solution:** Analysing the problem - Algorithm - Flowchart - Pseudo code	6
	Total	30

Text Books	
1	Basic and Applied Electronics-T.K Bandyopadhyay, Books and Allied Pvt Ltd (2002)
2	B.L.Theraja,"Basic Solid-state Electronics",S.Chand&Co
3	V.K.Mehta, "Principles of Electronics",S.Chand& Co
4	R.L.Boylestad, L.Nashelsky, ElectronicDevices and CircuitTheory,Pearson Education(2006).
5	PradeepK.Sinha and PritiSinha,(2004)—Computer Fundamentals, Sixth Edition, BPB Publications
6	Maureen Sprankle and Jim Hubbard,(2009)—Problem Solving and Programming Concept, Ninth Edition, Prentice Hall.
References Books	
1	N Bhargava,DCKulshreshtha and S C Gupta, Basic Electronics and linear circuits, Tata McGraw-Hill (2007).
2	J.MillmanandC.Halkias, Integrated Electronics, Tata McGraw Hill (2001).
3	C.S.V.Murthy,(2009)—FundamentalsofComputers‖,ThirdEdition,Himalaya Publishing House
Web Resources	
1	http://www.tutorialspoint.com/computer_fundamentals/
2	http://www.top-windows-tutorials.com/computer-basics/
3	http://www.homeandlearn.co.uk/
4	https://archive.nptel.ac.in/courses

MAPPING of COs with POs

CO-PO Mapping (Course Articulation Matrix)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	1	1	1	0	2	0
CO2	2	3	3	1	0	2	1
CO3	2	3	2	2	0	2	1
CO4	2	3	3	2	1	2	1
TotalScore	9	10	9	6	1	8	3

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

MAPPING of COs with PSOs

CO-PSO Mapping (Course Articulation Matrix)

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	1	1	1	0	2	0
CO2	2	3	2	1	0	2	1
CO3	2	3	2	2	0	2	1
CO4	2	3	3	2	1	2	1
TotalScore	9	10	8	6	1	8	3

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

SEMESTER II

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	DIGITAL ELECTRONICS	**Core Course 3 (CC-3)**	**5**	**-**	**-**	**-**	**5**	**5**	**25**	**75**	**100**

Course Outcomes

	COs		RBT
	CO1	explain the concepts of number systems, codes, logic gates, Boolean algebra, logic families, combinational circuits, sequential circuits, registers, and memory devices used in digital electronics.	K1, K2
	CO2	apply Boolean algebra, Karnaugh maps, arithmetic circuits, multiplexers, decoders, encoders, flip-flops, counters, and registers to solve digital circuit problems and design basic digital systems.	K3
	CO3	analyze combinational and sequential logic circuits, evaluate circuit behavior, simplify logic functions, and determine the performance of digital electronic systems.	K4
	CO4	design and evaluate digital circuits using logic gates, arithmetic circuits, counters, shift registers, and memory devices to develop solutions for practical digital applications.	K5,K6

UNIT	Details	No .of Hours
I	**NUMBER SYSTEM AND CODES:** Decimal, Binary, Octal and Hexadecimal number systems, base conversions. representationof Signed and unsigned numbers, BCD code. binary, Octal and hexadecimal - BCD-Excess3, Gray code-alphanumeric codes.	15

II	**DIGITAL LOGIC FAMILIES:** Fan-in, Fan out, Noise Margin, Power Dissipation, Figure of merit, Speed power product, comparison of TTL and CMOS families. Truth Tables of OR, AND, NOT, NOR, NAND, EX-OR, Universal gates, Basic postulates and fundamental theorems of Boolean algebra, Demorgan'sTheorem.Karnaugh Maps: two, three and four variable K-Map.	15
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.	15
IV	**LATCHES:** 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.	15
V	**REGISTERS AND MEMORIES:** 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.	15
	Total	75

Text Books	
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
References Books	
1	Digital Practice using Integrated Circuits–R.P.Jain and Anand
2	Fundamentals of Digital Circuits,AnandKumar, 2nd Edn,2009,PHIL Earning Pvt.Ltd.
3	Digital Circuits and systems,Venugopal,2011,TataMcGraw Hill.
4	Digital Systems: Principles & Applications, R.J.Tocci,N.S.Widmer,2001,PHILearning
5	Digital Principles,R.L.Tokheim, Schaum"s Outline Series,TataMcGraw-Hill(1994)
Web Resources	
1	https://onlinelibrary.wiley.com/doi/book/10.1002/9780470510520
2	https://www.freebookcentre.net/electronics_communication_books/Digital-Electronics-Books-Download.html

MAPPING of COs with POs

CO-PO Mapping (Course Articulation Matrix)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	1	2	1	0	1	0
CO2	2	3	3	1	0	2	1
CO3	2	3	3	2	0	2	1
CO4	2	3	3	2	1	2	1
TotalScore	9	10	11	6	1	7	3

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

MAPPING of COs with PSOs

CO-PSO Mapping (Course Articulation Matrix)

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	1	1	0	1	0
CO2	2	3	2	1	0	2	1
CO3	2	3	2	2	0	2	1
CO4	2	3	3	2	1	2	1
TotalScore	9	11	8	6	1	7	3

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

Subject Code	**Subject Name**	**Category**	**L**	**T**	**P**	**S**	**Credits**	**Inst. Hours**	**Marks**		
									CIA	**External**	**Total**
	DIGITAL ELECTRONICS LAB	**CORE Practical – 4 (CC-4)**	**-**	**-**	**4**	**-**	**3**	**4**	**50**	**50**	**100**
Course Outcomes											
	COs	On completion of this course, students can able to									**RBT**
	CO1	explain the operation, truth tables, and characteristics of logic gates, Boolean laws, combinational circuits, sequential circuits, counters, shift registers, and digital ICs used in laboratory experiments.									K1, K2

	CO2	perform experiments to construct, verify, and test logic gates, code converters, multiplexers, de-multiplexers, arithmetic circuits, counters, and flip-flops using standard digital ICs.	K3
	CO3	analyze the performance and output characteristics of combinational and sequential logic circuits, verify logical relationships, and interpret experimental results.	K4
	CO4	evaluate and design digital circuits using logic gates, arithmetic circuits, counters, shift registers, and flip-flops to implement practical digital electronic applications.	K5,K6

UNIT	**Details**	**No .of Hours**
I	Study and verify truth tables of AND, OR, NOT, NAND, NOR and XOR gates and Design all logic gates using NAND gate.	12
II	Design all logic gates using NOR gate and Verify Demorgan‟s theorem.	12
III	Construction of gates using discrete components and Code conversion and Multiplexer using IC 74153 and De-Multiplexer using IC 74155.	12
IV	Truth table verification of Half adder and Full adder and Encoder using IC 74147 and Decoder using IC 7442 and Up counter using IC 7490 or IC 7493.	12
V	Truth table verification of Half subtractor and Full subtractor and Study of M-S and J-K Flip flopsusing7476IC , Parallel-in and Parallel-out Shift register using IC 7495 Clock generation using NAND or NOR gate.	12
	Total	40

Text Books	
1	M.Morris Mano Digital System Design, Pearson Education Asia (Fourth Edition)
2	Thomas L. Flyod, Digital Fundamentals, Pearson Education Asia(1994)
References Books	
1	W.H. Gothmann, Digital Electronics: An Introduction to Theory and Practice, Prentice Hall of India (2000)
2	R.L.Tokheim,Digital Principles, Schaum,, Outline Series, Tata McGraw-Hill(1994)
Web Resources	
1	https://www.technicalbookspdf.com/electronic-engineering/digital-electronics/
2	https://easyengineering.net/digital-electronics-by-godse/

MAPPING of COs with POs

CO-PO Mapping (Course Articulation Matrix)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	1	2	1	0	1	0
CO2	2	3	3	1	0	2	1
CO3	2	3	3	2	0	2	1
CO4	2	3	3	2	1	2	2
TotalScore	9	10	11	6	1	7	4

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

MAPPING of COs with PSOs

CO-PSO Mapping (Course Articulation Matrix)

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	1	1	0	1	0
CO2	2	3	3	1	0	2	1
CO3	2	3	3	2	0	2	1
CO4	2	3	3	2	1	2	2
TotalScore	9	11	10	6	1	7	4

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	INTRODUCTION OF PYTHON LANGUAGE	**Elective – 2 (ELE-2)**	**0**	**5**	**-**	**-**	**5**	**5**	**25**	**75**	**100**

Course Outcomes

	COs	On completion of this course, students can able to	RBT
	CO1	explain the fundamental concepts of Python programming including variables, operators, control structures, functions, modules, data structures, file handling, object-oriented programming, and GUI components.	K1, K2
	CO2	apply Python programming constructs such as functions, strings, lists,	K3

		tuples, dictionaries, files, exceptions, classes, and GUI widgets to develop programs for solving computational problems.	
	CO3	analyze programming problems using Python language features, data structures, object-oriented concepts, exception handling, and file processing techniques to obtain efficient solutions.	K4
	CO4	design and evaluate Python-based applications incorporating data structures, object-oriented programming, file handling mechanisms, and graphical user interfaces for practical applications.	K5,K6
UNIT	**Details**		**No .of Hours**
I	**BASICS OF PYTHON PROGRAMMING:** Features of Python, variables and identifiers, operators and expressions. Decision control Statements: Selection/Conditional branching statements, basic loop structures/iterative Statements, nested loops, break, continue, and pass Statements. Functions and Modules: function definition, function call, more on defining functions, recursive functions, modules.		15
II	**DATA STRUCTURES: Strings:** Introduction, built-in string methods and functions, slice operation, String Module. Regular Expressions. **Lists:** Introduction, nested list, cloning lists, basic list operations, list methods. **Functional programming:** filter(), map(),reduce()function.		15
III	**FILES AND EXCEPTIONS:** Read and writing files, pickling, handling exceptions. Built-in and user-defined exceptions. OOPS Concepts: Introduction, classes and object, class method and self-argument, the init () method, class variables and object variables, public and private data members, Inheritance, Operator Overloading.		15
IV	**TUPLES:** Introduction, basic tuple operations, tuple assignment, tuples for returning multiple values, nested tuples, tuple methods and functions. **Set:** Introduction, Set operations. **Dictionaries:** Basic operations, sorting items, looping over dictionary, nested dictionaries, built-indictionaryfunctions.		15
V	**GRAPHICAL USER INTERFACES**: Behavior of terminal- based programs and GUI-based programs, Coding simple GUI- based programs, other useful GUI resources. **GUI Programming:** Graphical User Interfaces, Using the inter Module, Display text with Label Widgets, Organizing, Widgets with Frames, Button Widgets and Info Dialog Boxes, Getting Input with Entry Widget, Using Labels as Output Fields, Radio Buttons, Check Buttons.		15
	Total		75

Text Books	
1	Kenneth A.Lambert, The Fundamentals of Python: First Programs,2011,Cengage Learning.
2	Think Python First Edition, by Allen B. Downey, Oriellypublishing
References Books	
1	ReemaThareja, "Python programming using problem solving approach", Oxford University press.
2	AllenDowney,"ThinkPython:HowtoThinkLikeaComputerScientist",O"Reilly publications,2nd Edition
3	Albert Lukaszewski, "My SQL for python", PACKT publishers
4	MarkLutz,"Learning Python", O"Reilly Publications
Web Resources	
1	http://nptel.ac.in/courses/117106113/34
2	www.scipy-lectures.org/intro/language/python_language.html

MAPPING of COs with POs

CO-PO Mapping (Course Articulation Matrix)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	1	1	1	0	3	0
CO2	2	3	3	1	0	3	1
CO3	2	3	2	2	0	3	1
CO4	2	3	3	2	1	3	2
TotalScore	9	10	9	6	1	12	4

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

MAPPING of COs with PSOs

CO-PSO Mapping (Course Articulation Matrix)

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	1	1	1	0	3	0
CO2	2	3	2	1	0	3	1
CO3	2	3	2	2	0	3	1
CO4	2	3	3	2	1	3	2
TotalScore	8	10	8	6	1	12	4

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	PROGRAMMING IN PYTHON LAB (Skill Enhancement course) – 2	**Practical (SEC – 2)**	**-**	**-**	**2**	**-**	**2**	**2**	**50**	**50**	**100**

Course objectives

The main objectives of this course are to:

- develop practical programming skills using Python control structures, loops, strings, lists, dictionaries, and functions.
- apply Python programming techniques to solve basic computational and real-life problems.
- enhance problem-solving and logical thinking abilities through hands-on programming exercises.
- design simple GUI-based applications and gain experience in testing and debugging Python programs.

Course Outcomes

COs	On completion of this course, students can able to	RBT
CO1	explain the concepts and syntax of Python programming constructs including control statements, loops, strings, lists, dictionaries, functions, and GUI components used in practical applications.	K1, K2
CO2	apply Python programming techniques to develop programs involving numerical computations, string processing, list manipulation, dictionary traversal, and graphical user interfaces.	K3
CO3	nalyze programming problems, select suitable Python constructs, and interpret program outputs to obtain correct and efficient solutions.	K4
CO4	design, test, and evaluate Python programs for real-world applications using appropriate data structures, programming logic, and GUI-based interfaces.	K5,K6

UNIT	Details	No .of Hours
I	Basic Programs using Control statements and Loops, Solve and find the power bill for domestic households.	6
II	Sort a list of numbers in ascending order, Program to calculate and print the number of minutes in a year	6
III	Check if a string is palindrome, Program using various String methods	6
IV	Sort a list of names in alphabetic order, Program using List Methods	6

V	Program for traversing a dictionary, Program using Graphical User Interface	6
	Total	30

Text Books	
1	Kenneth Lambert ,"Fundamentals of Python" ,TMH
References Books	
1	Allen Downey, 'Think Python: How to Think Like a Computer Scientist", O'Reillypublications, 2nd Edition
Web Resources	
1	https://www.Python-tutorials.ws/Python_1.html
2	https://www.geeksforgeeks.org/Python_lists/

MAPPING of COs with POs

CO-PO Mapping (Course Articulation Matrix)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	1	1	1	0	3	0
CO2	2	3	3	1	0	3	1
CO3	2	3	2	2	0	3	1
CO4	2	3	3	2	1	3	2
TotalScore	9	10	9	6	1	12	4

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

MAPPING of COs with PSOs

CO-PSO Mapping (Course Articulation Matrix)

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	1	1	1	0	3	0
CO2	2	3	2	1	0	3	1
CO3	2	3	2	2	0	3	1
CO4	2	3	3	2	1	3	2
TotalScore	8	10	8	6	1	12	4

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks		
									CIA	External	Total
	COMPUTER HARDWARE (Skill Enhancement Course) -3	**SEC-3**	**2**	**-**	**-**	**-**	**2**	**2**	**25**	**75**	**100**

Course Outcomes

	COs	On completion of this course, students can able to	RBT
	CO1	explain the architecture, functions, and operating principles of CPUs, memory systems, motherboards, power supplies, storage devices, and optical drives used in computer hardware systems.	K1, K2
	CO2	apply knowledge of computer hardware components to identify, install, configure, upgrade, and maintain computer systems and peripheral devices.	K3
	CO3	analyze the performance, organization, compatibility, and operational characteristics of processors, memory modules, motherboards, power systems, and storage devices to diagnose hardware-related issues.	K4
	CO4	evaluate and recommend suitable computer hardware configurations and design solutions for system installation, maintenance, troubleshooting, and performance enhancement based on user requirements.	K5,K6

UNIT	Details	No .of Hours
I	**CPU:** CPU essentials–processor modes–modern CPU Concepts – Architectural performance features–the Intel's CPU	6
II	**MEMORY CONCEPT:** Essential memory concepts – memory organizations– memory packages–modules–logical memory organizations – memory considerations – memory types – memory techniques – selecting and installing memory	6
III	**MOTHERBOARD:** Active motherboards – sockets and slots – Intel D850GB – Pentium4 mother board – expansion slots –form factor–upgrading a motherboard– chipsets–north bridge – south bridge	6
IV	**POWERSUPPLY:** Power supplies and power management– concepts of switching regulation– potential Power problems – power management. The floppy drive – magnetic storage – magnetic recording principles–data and disk organization– floppy drive–hard drive–data organization and hard drive– sector layout	6

V	**DRIVES:** IDE drive standard and features–Hard drive electronics – CDROM drive construction – CDROM electronics – DVD-ROM – DVD media – DVD drive and decoder.	6
	Total	30

Text Books	
1	Stephen J. Bigelow,— Trouble Shooting, maintaining and Repairing PCs, Tata McGraw-Hill, New Delhi, 2001.
2	Craig Zacker& John Rourke, — The complete reference: PC hardware, Tata McGraw-Hill, New Delhi,2001.
References Books	
1	Mike Meyers, Introduction to PC Hardware and Troubleshooting, Tata McGraw-Hill, New Delhi,2003
2	B.Govindarajulu,IBMPCandCloneshardwaretroubleshootingandMaintenance,Tata McGraw - Hill,New Delhi,2002
Web Resources	
1	https://egyankosh.ac.in/bitstream/123456789/33613/1/Unit-13.pdf
2	https://cdn.ttgtmedia.com/search Systems Channel/downloads/Windows7Bible.pdf

MAPPING of COs with POs

CO-PO Mapping (Course Articulation Matrix)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	1	2	1	0	2	0
CO2	2	3	3	1	0	3	1
CO3	2	3	2	2	0	3	1
CO4	2	3	3	2	1	3	2
TotalScore	9	10	10	6	1	11	4

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

MAPPING of COs with PSOs

CO-PSO Mapping (Course Articulation Matrix)

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	2	1	1	1	0	3	0
CO2	2	3	2	1	0	3	1
CO3	2	3	2	2	0	3	1
CO4	2	3	3	2	1	3	2
TotalScore	8	10	8	6	1	12	4

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

Subject Code	Subject Name	Category	L	T	P	S	Credits	Inst. Hours	Marks
									External
	FOUNDATION IN ELECTRONICS	**Naan Muthalvan**	**2**	**-**		**-**	**2**	**2**	**100 Marks**

Course Outcomes

	COs	On completion of this course, students can able to	RBT
	CO1	explain the characteristics and applications of resistors, semiconductor materials, p–n junction diodes, rectifiers, digital number systems, logic gates, and memory devices.	K1, K2
	CO2	apply the principles of semiconductor devices, rectifier circuits, voltage regulators, number systems, and logic gates to solve basic electronics and digital circuit problems.	K3
	CO3	analyze the operation and performance of diode circuits, rectifiers, digital logic circuits, memory devices, and programmable logic systems for various electronic applications.	K4
	CO4	evaluate and design simple electronic and digital circuits using semiconductor devices, logic gates, memory devices, and programmable logic components for practical applications.	K5,K6

UNIT	Details	No .of Hours
I	Type of resistors – color code –construction of various types of resistors (carbon composition, carbon film, wire-wound etc.)	6
II	**SEMICONDUCTOR BASICS:** Introduction to Semiconductor materials, Intrinsic & Extrinsic Semiconductors. P-type semiconductors, N-type semiconductors, p-n junction diode	6

III	Half wave and Full wave rectifier – Bridge rectifier –clippers and clampers - Zener diodeCharacteristics -voltage regulation using Zener diode	6
IV	Decimal, Binary, Octal and Hexadecimal number systems, base conversions. Digital Logic families. Truth Tables of OR, AND, NOT, NOR, NAND, EX-OR, Universal gates.	6
V	Memory Devices: Classification of memories – ROM-PROM – EPROM – EE PROM – EAPROM – RAM – Static RAM Cell – Bipolar RAM cell – MOSFET RAM cell – Dynamic RAM cell – Programmable Logic Devices.	6
	Total	30

Text Books	
1	V.K.Mehta, "Principles of Electronics",S.Chand&Co
2	B.L.Theraja,"Basic Solid-state Electronics",S.Chand&Co
3	M.Morris Mano Digital System Design, Pearson Education Asia (Fourth Edition)
4	Thomas L. Flyod, Digital Fundamentals, Pearson Education Asia(1994)
References Books	
1	Semiconductor Physics and Devices- Basic Principles, 4th Edition.by**DonaldA.Neamen**(2021)
Web Resources	
1	https://www.electronics-tutorials.ws/diode/diode_1.html
2	https://www.electronicshub.org/types-of-semiconductor-devices/
3	https://www.britannica.com/technology/semiconductor-device

Methods of Evaluation		
External	Semester Examination	100Marks

MAPPING of COs with POs

CO-PO Mapping (Course Articulation Matrix)

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3	1	2	1	0	1	0
CO2	2	3	3	1	0	2	1
CO3	2	3	3	2	0	2	1
CO4	2	3	3	2	1	2	1
TotalScore	9	10	11	6	1	7	3

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

MAPPING of COs with PSOs

CO-PSO Mapping (Course Articulation Matrix)

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
CO1	3	2	1	1	0	1	0
CO2	2	3	2	1	0	2	1
CO3	2	3	2	2	0	2	1
CO4	2	3	3	2	1	2	1
TotalScore	9	11	8	6	1	7	3

Level of Correlation between COs and POs

0– No Correlation 1–Low 2–Medium 3–High

Methods of Evaluation-Theory		
Internal Evaluation	Continuous Internal Assessment Test	25 Marks
	Assignments	
	Seminars	
	Attendance and Class Participation	
External Evaluation	End Semester Examination	75 Marks
	Total	100 Marks
Methods of Evaluation-Practical		
Internal Evaluation	Lab performance, attendance, record note book maintenance, model practical examination	50 Marks
External Evaluation	End Semester Examination with viva-voce	50 Marks
	Total	100 Marks
Methods of Assessment		
Recall(K1)	Simple definitions, MCQ, Recall steps, Concept definitions	
Understand/ Comprehend (K2)	MCQ, True/False, Short essays, Concept explanations, short summary or Overview	
Application(K3)	Suggest idea/concept with examples, suggest formulae, Solve problems, Observe, Explain	
Analyze(K4)	Problem-solvingquestions,finishaprocedureinmanysteps,Differentiate	
	Between various ideas, Map knowledge	
Evaluate(K5)	Longer essay/Evaluation essay, Critique or justify with pros and cons	
Create(K6)	Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations	