MANONMANIAM SUNDARANAR UNIVERSITY,

TIRUNELVELI

B.Sc. ELECTRONICS AND COMMUNICATION

SYLLABUS

FROM THE ACADEMIC YEAR

2026-2027 and onwards

MANONMANIAM SUNDARANAR UNIVERSITY,TIRUNELVELI

B.Sc., Electronics and Communication

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 down trodden students including women, socially oppressed and differently abled.

PREAMBLE

The Bachelor of Science (B.Sc.) Electronics and Communication Programme of Manonmaniam Sundaranar University is designed to provide students with a strong foundation in the principles and applications of electronics and communication technologies. The programme aims to develop comprehensive knowledge and practical skills in electronic devices, analog and digital circuits, communication systems, microprocessors, embedded systems, signal processing, wireless communication, networking, and emerging communication technologies. It prepares students to understand, analyze, design, and implement electronic and communication systems for real-world applications.

In alignment with the Vision and Mission of the University and the objectives of the National Education Policy (NEP), the curriculum adopts an outcome-based and learner-centric approach that promotes multidisciplinary learning, skill development, innovation, and

employability. The programme integrates classroom instruction with laboratory experiments, project-based learning, internships, industrial exposure, and value-added courses to strengthen technical competence, analytical thinking, problem-solving abilities, and entrepreneurial skills.

The curriculum is carefully structured to meet the requirements of higher education, research, and professional careers in electronics, telecommunications, information technology, embedded system design, networking, automation, broadcasting, consumer electronics, and allied industries. It also encourages students to develop scientific temper, ethical values, environmental awareness, effective communication skills, teamwork, leadership qualities, and social responsibility.

Through a balanced blend of theoretical knowledge and practical training, the B.Sc. Electronics and Communication Programme seeks to produce competent and socially responsible graduates who can adapt to rapid technological advancements, contribute to innovation and research, and effectively serve the needs of industry, society, and national development.

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.

PROGRAMMEOUT COMES (PO)

After the successful completion of Undergraduate Programme from the University, the learner should be able to

PO1:Comprehend the knowledge acquired and communicate the same to others.

PO2: Analyze and compare the factual data/ situation to comprehend and to critically evaluate to find solution to the problem ahead.

PO3: Apply theories and philosophies learned in solving the problem in scientific manner.

PO4: Think reflectively on the earlier activities and attempt for self directed lifelong learning process.

PO5: Understand multicultural existence and identify the means to prolong moral/ethical values in personal and professional life.

PO6: Explore through multiple sources and get exposed to the digital technology.

PO7: Act as a responsible member in teams and practice leadership qualities.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

After the successful completion of B.Sc. Electronics and Communication Programme

from the University, the learner should be able to

PSO1: Electronics Fundamentals and Applications

Demonstrate a sound understanding of electronic devices, analog and digital circuits, linear integrated circuits, and electronic measurements to explain and solve basic electronics-related problems.

PSO2: Communication Systems Competency

Apply the principles of analog and digital communication, optical fiber communication, mobile communication, and networking technologies to analyze and develop communication-based solutions.

PSO3: Hardware and Embedded System Development

Utilize microprocessors, microcontrollers, embedded systems, IoT platforms, and related hardware technologies to design, implement, and troubleshoot electronic systems for real-world applications.

PSO4: Computational and Digital Skills

Employ programming languages, software tools, computational techniques, and modern digital technologies to develop applications, process information, and support electronics and communication system design.

PSO5: Analytical and Problem-Solving Ability

Analyze electronic and communication engineering problems, interpret experimental results, and apply scientific principles to design appropriate and efficient solutions.

PSO6: Independent Learning and Professional Development

Demonstrate self-learning ability, adaptability to emerging technologies, effective communication, teamwork, leadership qualities, and entrepreneurial skills for higher studies and professional careers.

PSO7: Ethical Practice and Social Responsibility

Apply ethical values, environmental awareness, professional responsibility, and societal considerations while developing and utilizing electronics and communication technologies for sustainable development.

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

(3Pages) 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	5.	The gate voltage in a JFET at which drain current becomes zero is called _____ 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 Outcom	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 (a) NPN transistor (b) PNP transistor.
CO2	K2	17b.	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. 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 and Communication)

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 of Python 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 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	Communication Systems	4	5
	Core 11	Microprocessor and Microcontroller Lab	4	6
	Core 12	Mini Project	2	4
	Elective Course 5 (Domain Specific)	Computer Networks / Optical Display Devices	3	4
	Elective Course 6 (Domain Specific)	VLSI Technology/ 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	Optical Fiber Communication	4	5
	Core 14	IoT and its applications	4	5
	Core 15	Communication and System Design Lab	4	6
	Core 16	Major Project	4	4
	Elective Course 7 (Domain Specific)	Artificial Intelligence / PCB Design	3	4
	Elective Course 8 (Domain Specific)	Embedded Systems and RTOs / Power Electronics	3	4
	Naan Mudhalvan	As per TN Govt. Guidelines	2	2
Part V	Extension Activity	NSS/NCC/YRC	1	-
	Total		25	30

B.Sc., Electronics and Communication

PSOs: SEVEN Programme Specific Outcomes (PSO) in line with the POs proposed for the Post graduate and Under graduate programme.

Title of the Course	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	Total Score
Basic Electronic Devices	3	1.75	1.5	1.25	2.75	1.25	0.5	12
Basic Electronics Devices Lab	3	1.75	2	1.25	2.75	1.25	1.25	13.25
Introduction of C Language	1	0.75	1	3	2.75	2	0.25	10.75
Programming in C Lab	1	0.75	1	3	2.75	2	0.25	10.75
Foundation for Electronics and Computers	2.75	1.75	1.5	2.75	2.75	1.75	1.25	14.5
Digital Electronics	3	1.75	2	2	2.75	1.75	0.5	13.75
Digital Electronics Lab	3	1.75	2	2	2.75	1.75	0.5	13.75
Introduction of Python Language	1	0.75	1	3	2.75	2	0.25	10.75
Programming in Python Lab	1	0.75	1	3	2.75	2	0.25	10.75
Computer Hardware	2	0.75	2.75	2	2.5	1.75	0.25	12
Foundation in Electronics	3	1.75	1.5	1.25	2.75	1.75	0.5	12.5
Total score of all courses contributing to PSO	23.75	14.25	17.25	24.5	30	19.25	5.75	

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

Credit Distribution for B.Sc., Electronics and Communication

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 • NaanMuthalvan	8 1 2 10
			142

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

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	describe the construction, specifications, and applications of passive components and explain semiconductor fundamentals including intrinsic and extrinsic semiconductors.	K1, K2
	CO2	explain the operation and characteristics of PN junction diodes, rectifiers, clippers, clampers, and Zener diode circuits.	K3
	CO3	analyze the characteristics and performance of transistor configurations, biasing methods, UJT, and SCR-based circuits.	K4
	CO4	evaluate and compare the characteristics of JFET and MOSFET devices and apply suitable electronic devices in practical circuit 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 polystyrene electrolytic)–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 and N 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, features and characteristics - 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	Donald A. Neamen, “Semiconductor Physics and Devices-BasicPrinciples”, McGraw-Hill, 4thEdition (2021)
2	Robert L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuit Theory*, Pearson Education, 12th Edition.
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	3	2	3	1	0	1	0
CO3	2	3	3	2	0	1	1
CO4	2	3	3	2	1	2	1
TotalScore	10	9	11	6	1	5	2

LevelofCorrelationbetweenCOsandPOs

0–NoCorrelation 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	0	1	2	1	0
CO2	3	2	1	1	3	1	0
CO3	3	2	2	1	3	1	1
CO4	3	2	3	2	3	2	1
TotalScore	12	7	6	5	11	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	recall and explain the operating principles, characteristics, experimental procedures, and measurement techniques of PN junction diodes, Zener diodes, BJTs, FETs, LDRs, photodiodes, phototransistors, UJTs, and SCRs.	K1, K2
	CO2	apply appropriate laboratory procedures, circuit connections, testing methods, and measuring instruments to obtain the characteristics of semiconductor and	K3

		optoelectronic devices and determine transistor bias stability factors.	
	CO3	analyze experimental observations, characteristic curves, biasing performance, and device parameters to compare the behavior and performance of various electronic devices under different operating conditions.	K4
	CO4	evaluate the performance of electronic devices for specific applications, troubleshoot practical circuits, interpret experimental results critically, and design or modify experimental setups to achieve desired outcomes.	K5,K6

UNIT	Details	No .of Hours
I	PN Junction diode and Zener diode Characteristics	12
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);	12
III	Measurement of stability factor of self-biasing method ;Measurement of stability factor of fixed-biasing method- Field Effect Transistor (FET) characteristics	12
IV	Photoconductivity measurements of LDR, Photodiode characteristics, Phototransistor characteristics	12
V	UJT and SCR characteristics	12
		60

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	Donald A. Neamen, “Semiconductor Physics and Devices-BasicPrinciples”, McGraw-Hill, 4thEdition (2021)
2	Robert L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuit Theory*, Pearson Education, 12th Edition.
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	2	1
CO2	3	3	3	1	0	2	1
CO3	2	3	3	2	0	2	1
CO4	2	3	3	3	1	2	2
TotalScore	10	10	11	7	1	8	5

Level of Correlation between COs and PSOs

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	2	1	1
CO2	3	2	2	1	3	1	1
CO3	3	2	2	1	3	1	1
CO4	3	2	3	2	3	2	2
TotalScore	12	7	8	5	11	5	5

LevelofCorrelationbetweenCOsandPSOs

0–NoCorrelation 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 Outcomes

	COs	On completion of this course, students can able to	RBT
	CO1	recall and explain the concepts of programming languages, algorithms, flowcharts, C language fundamentals, data types, operators, control statements, functions, arrays, structures, pointers, and file handling.	K1, K2
	CO2	apply C programming constructs, operators, control structures, functions, arrays, strings, structures, and file operations to develop solutions for simple computational problems.	K3
	CO3	analyze program requirements, select appropriate programming	K4

		constructs, examine program logic, and interpret the execution of C programs for problem solving.	
	CO4	evaluate alternative programming approaches, debug and optimize C programs, and design efficient solutions using functions, arrays, pointers, structures, and file processing techniques.	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
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	2	0	3	0
CO2	3	3	3	2	0	3	1
CO3	2	3	3	3	0	2	1
CO4	2	3	3	3	1	2	1
TotalScore	10	10	10	10	1	10	3

Level of Correlation between COs and PSOs

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	1	0	0	3	2	1	0
CO2	1	1	1	3	3	2	0
CO3	1	1	1	3	3	2	0
CO4	1	1	2	3	3	3	1
TotalScore	4	3	4	12	11	8	1

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**
	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	recall and explain the syntax, programming constructs, algorithms, and procedures used in developing C programs for mathematical computations, string processing, sorting techniques, recursion, and statistical calculations.	K1, K2

	CO2	apply C programming concepts to develop, compile, and execute programs for temperature conversion, quadratic equation solving, matrix operations, palindrome checking, grading systems, sorting methods, recursion, and numerical computations.	K3
	CO3	analyze programming problems, select suitable algorithms and data structures, interpret program outputs, and evaluate the correctness and efficiency of implemented C programs.	K4
	CO4	evaluate alternative programming approaches, debug and optimize C programs, and design efficient solutions for computational and real-world applications using structured programming techniques.	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.cprogramming.com
2	https://archive.nptel.ac.in/courses
3	https://www.programiz.com/c-programming

MAPPING of COs with POs

CO-PO Mapping (Course Articulation Matrix)

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

Level of Correlation between COs and PSOs

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	1	0	0	3	2	1	0
CO2	1	1	1	3	3	2	0
CO3	1	1	1	3	3	2	0
CO4	1	1	2	3	3	3	1
TotalScore	4	3	4	12	11	8	1

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**
	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	recall and explain the fundamental concepts of semiconductor materials, diode circuits, transistor devices, feedback amplifiers, oscillators, computer software, programming languages, algorithms, flowcharts, and problem-solving techniques.	K1, K2

	CO2	apply the principles of semiconductor devices, rectifier circuits, voltage regulation, programming structures, algorithms, flowcharts, and software concepts to solve basic electronics and computing problems.	K3
	CO3	analyze the operation and characteristics of electronic circuits, transistor configurations, oscillators, programming structures, and computational problem-solving methods to identify suitable solutions for given applications.	K4
	CO4	evaluate electronic and computational approaches, design simple solutions using algorithms and flowcharts, and justify the selection of appropriate electronic devices, programming structures, and software tools 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:** Type of Software's – System Architecture Machine Language – Assembly Language-High Level Language - Object Oriented Languages **PROGRAMMINGSTRUCTURE:** Modules and their function- Local and Global variables-Parameters-Return values-Sequential Logic Structure.		6
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,D C Kulshreshtha and S C Gupta, Basic Electronics and linear circuits, Tata McGraw-Hill (2007).
2	J.Millmanand C.Halkias, Integrated Electronics, Tata Mc Graw Hill (2001).
3	C.S.V.Murthy,(2009)―Fundamentals of Computers‖, Third Edition, 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	2	1	0	3	0
CO2	3	3	3	2	0	3	1
CO3	2	3	3	3	0	2	1
CO4	2	3	3	3	1	2	1
TotalScore	10	10	11	9	1	10	3

Level of Correlation between COs and PSOs

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	2	2	1	1
CO2	3	2	1	3	3	1	1
CO3	3	2	2	3	3	2	1
CO4	2	2	2	3	3	3	2
TotalScore	11	7	6	11	11	7	5

Level of Correlation between COs and PSOs

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	On completion of this course, students can able to	RBT
	CO1	recall and explain the concepts of number systems, digital codes, Boolean algebra, logic gates, logic families, combinational circuits, sequential circuits, registers, counters, and memory devices used in digital electronics.	K1, K2
	CO2	apply number system conversions, Boolean algebra principles, Karnaugh map simplification techniques, and digital circuit design methods to implement combinational and sequential logic circuits.	K3
	CO3	analyze the performance and operation of logic families, arithmetic circuits, multiplexers, decoders, flip-flops, counters, shift registers, and memory organization in digital systems.	K4
	CO4	evaluate and design optimized digital systems using logic minimization techniques, combinational and sequential circuit design principles, and suitable memory devices for specific applications.	K5,K6

UNIT	Details	No .of Hours
I	**NUMBERSYSTEMANDCODES:** 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's Theorem. 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, Anand Kumar, 2nd Edn,2009,PHIL Earning Pvt. Ltd.
3	Digital Circuits and systems, Venugopal,2011, Tata McGraw Hill.
4	Digital Systems: Principles & Applications, R.J.Tocci, N.S.Widmer, 2001, PHI Learning
5	Digital Principles ,R.L.Tokheim, Schaum's Outline Series, Tata McGraw-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	2	0
CO2	3	3	3	2	0	2	1
CO3	2	3	3	3	0	2	1
CO4	2	3	3	3	1	2	1
TotalScore	10	10	11	9	1	8	3

Level of Correlation between COs and PSOs

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	2	2	1	0
CO2	3	2	2	2	3	1	0
CO3	3	2	2	2	3	2	1
CO4	3	2	3	2	3	3	1
TotalScore	12	7	8	8	11	7	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
	DIGITAL ELECTRONICS LAB	**CORE Practical – 4 (CC-4)**	**-**	**-**	**4**	**-**	**3**	**4**	**50**	**50**	**100**

Course Outcomes

	COs		RBT
	CO1	recall and explain the operating principles, truth tables, circuit configurations, and experimental procedures of logic gates, combinational circuits, sequential circuits, counters, shift registers, and clock generation circuits.	K1, K2
	CO2	apply digital electronics concepts to construct, test, and verify logic gates, code converters, multiplexers, demultiplexers, adders, subtractors, encoders, decoders, flip-flops, counters, and shift registers using integrated circuits.	K3
	CO3	analyze the behavior and performance of digital circuits through truth table verification, logic analysis, timing considerations, and interpretation of experimental results.	K4
	CO4	evaluate and troubleshoot digital circuits, compare alternative implementations, and design simple combinational and sequential logic systems to meet specified functional requirements.	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, Design all logic gates using NOR gate	12
II	Verify Demorgan‟stheorem - Construction of gates using discrete components and Code conversion and Multiplexer using IC 74153 and De-Multiplexer using IC 74155	12
III	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
IV	Truth table verification of Half subtractor and Full subtractor and Study of M-S and J-K Flip flopsusing7476IC	12
V	Parallel-in and Parallel-out Shift register using IC 7495 Clock generation using NAND or NOR gate	12
	Total	60

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	2	1
CO2	3	3	3	1	0	2	1
CO3	2	3	3	2	0	2	1
CO4	2	3	3	3	1	2	2
TotalScore	10	10	11	7	1	8	5

Level of Correlation between COs and PSOs

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	2	2	1	0
CO2	3	2	2	2	3	1	0
CO3	3	2	2	2	3	2	1
CO4	3	2	3	2	3	3	1
TotalScore	12	7	8	8	11	7	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
	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	recall and explain the fundamental concepts of Python programming including variables, operators, control structures, functions, modules, data structures, file handling, exception handling, object-oriented programming, and GUI components.	K1, K2
	CO2	apply Python programming constructs, built-in functions, data structures, file operations, exception handling techniques, object-oriented concepts, and GUI elements to develop simple software applications.	K3
	CO3	analyze programming problems, select appropriate Python data structures and programming techniques, interpret program outputs, and examine the efficiency of developed solutions.	K4
	CO4	evaluate alternative programming approaches, debug and optimize Python programs, and design user-oriented applications using object-oriented programming and graphical user interface techniques.	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, nestedtuples, 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, RadioButtons, 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	2	0	3	0
CO2	3	3	3	2	0	3	1
CO3	2	3	3	3	0	2	1
CO4	2	3	3	3	1	2	1
TotalScore	10	10	10	10	1	10	3

Level of Correlation between COs and PSOs

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	1	0	0	3	2	1	0
CO2	1	1	1	3	3	2	0
CO3	1	1	1	3	3	2	0
CO4	1	1	2	3	3	3	1
TotalScore	4	3	4	12	11	8	1

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
	PROGRAMMING IN PYTHON LAB (Skill Enhancement course) - 2	**Practical (SEC – 2)**	**-**	**-**	**2**	**-**	**2**	**2**	**50**	**50**	**100**

Course Outcomes

	COs	On completion of this course, students can able to	RBT
	CO1	recall and demonstrate the use of Python syntax, control statements, loops, string operations, list methods, dictionary operations, and GUI programming concepts through laboratory exercises.	K1, K2
	CO2	apply Python programming constructs to develop programs for numerical computations, sorting operations, string processing, data handling, and simple	K3

		graphical user interface applications.	
	CO3	analyze programming problems, interpret program outputs, compare alternative coding approaches, and examine the functionality of Python programs using appropriate data structures and algorithms.	K4
	CO4	evaluate program efficiency, debug and optimize Python applications, and develop user-oriented solutions for practical computational problems using Python programming techniques.	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"Reilly publications, 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	2	0	3	1
CO2	3	3	3	2	0	3	1
CO3	2	3	3	3	0	2	1
CO4	2	3	3	3	1	2	2
TotalScore	10	10	10	10	1	10	5

Level of Correlation between COs and PSOs

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	1	0	0	3	2	1	0
CO2	1	1	1	3	3	2	0
CO3	1	1	1	3	3	2	0
CO4	1	1	2	3	3	3	1
TotalScore	4	3	4	12	11	8	1

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
	COMPUTER HARDWARE (Skill Enhancement Course) -3	**SEC-3**	**2**	**-**	**-**	**-**	**2**	**2**	**25**	**75**	**100**

Course Outcomes

	COs		RBT
	CO1	recall and explain the architecture, functions, and characteristics of CPUs, memory systems, motherboards, power supplies, storage devices, and optical drives used in computer hardware systems.	K1, K2

	CO2	apply the concepts of processor operation, memory organization, motherboard configuration, power management, and storage technologies to identify and configure computer hardware components.	K3
	CO3	analyze the structure and performance of CPUs, memory modules, chipsets, power systems, hard drives, and optical storage devices to understand hardware functionality and system requirements.	K4
	CO4	evaluate computer hardware configurations, troubleshoot hardware-related issues, recommend suitable upgrades, and select appropriate components for specific computing applications.	K5,K6

UNIT	**Details**	**No .of Hours**
I	**CPU:** CPU essentials–processor modes–modern CPUconcepts–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 driveElectronics – 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, IBM PC and Clones hardware troubleshooting and Maintenance,Tata McGraw-Hill,NewDelhi,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	1	1	0	3	0
CO2	3	3	2	2	0	3	1
CO3	2	3	3	2	0	2	1
CO4	2	3	3	3	1	2	1
TotalScore	10	10	9	8	1	10	3

Level of Correlation between COs and PSOs

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	0	2	2	1	1	0
CO2	2	1	3	2	3	1	0
CO3	2	1	3	2	3	2	0
CO4	2	1	3	2	3	3	1
TotalScore	8	3	11	8	10	7	1

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
									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	recall and explain the characteristics of resistors, semiconductor materials, PN junction diodes, rectifier circuits, number systems, logic gates, memory devices, and programmable logic devices.	K1, K2
	CO2	apply the principles of semiconductor devices, rectifier circuits, Zener diode voltage regulation, number system conversions, and logic gate operations to solve basic electronics problems.	K3
	CO3	analyze the operation and performance of rectifiers, clipping and clamping circuits, semiconductor devices, digital logic circuits, and memory organizations used in electronic systems.	K4
	CO4	evaluate electronic circuit behavior, compare memory technologies and digital logic implementations, and design simple electronic and digital systems 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, 4thEdition.by **DonaldA. Neamen**(2021)
2	
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	2	0
CO2	3	3	3	1	0	2	1
CO3	2	3	3	2	0	2	1
CO4	2	3	3	3	1	2	1
TotalScore	10	10	11	7	1	8	3

Level of Correlation between COs and PSOs

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	2	1	0
CO2	3	2	1	1	3	1	0
CO3	3	2	2	1	3	2	1
CO4	3	2	2	2	3	3	1
TotalScore	12	7	6	5	11	7	2

Level of Correlation between COs and PSOs

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-solving questions, finish a procedure in many steps, 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 off beat situations, Discussion, Debating or Presentations	