Holy Cross College (Autonomous), Nagercoil
Kanyakumari District, Tamil Nadu.
Accredited with A⁺ by NAAC - IV Cycle – CGPA 3.35
Affiliated to

Manonmaniam Sundaranar University, Tirunelveli

Semester I - IV

Guidelines & Syllabus

DEPARTMENT OF COMPUTER SCIENCE

2023-2026

(With effect from the academic year 2024-2025)

Issued from

THE DEANS' OFFICE

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Vision

To provide a high-quality undergraduate education in computer science that prepares students for productive careers and life-long learning.

Mission

1. To demonstrate proficiency in problem-solving techniques using the computer.
2. To demonstrate proficiency in at least two high-level programming languages and two operating systems
3. To show the ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
4. To show the ability to function effectively on teams to accomplish a common goal.
5. To sensitize the students to the social realities around them with the vision of making them responsible citizen.

Graduate Attributes

Graduates of our College develop the following attributes during the course of their studies.

➢ **Creative thinking:**

Equipping students with hands-on-training through skill-based courses and promote startup.

➢ **Personality development:**

Coping with increasing pace and change of modern life through value education, awareness on human rights, gender issues and giving counselling for the needful.

➢ **Environmental consciousness and social understanding:**

Reflecting upon green initiatives and understanding the responsibility to contribute to the society; promoting social and cultural diversity through student training and service-learning programmes.

➢ **Communicative competence:**

Offering effective communication skills in both professional and social contexts through bridge courses and activities of clubs and committees.

➢ **Aesthetic skills:**

Engaging mind, body and emotions for transformation through fine arts, meditation and exercise; enriching skills through certificate courses offered by Holy Cross Academy.

➢ **Research and knowledge enrichment:**

Getting in-depth knowledge in the specific area of study through relevant core papers; ability to create new understanding through the process of critical analysis and problem solving.

➢ **Professional ethics:**

Valuing honesty, fairness, respect, compassion and professional ethics among students. The students of social work adhere to the *National Association of Social Workers Code of Ethics*

➢ **Student engagement in the learning process:**

Obtaining extensive and varied opportunities to utilize and build upon the theoretical and empirical knowledge gained through workshops, seminars, conferences, industrial visits and summer internship programmes.

➢ **Employability:**

Enhancing students in their professional life through Entrepreneur development, Placement & Career guidance cell.

➢ **Women empowerment and leadership:**

Developing the capacity of self-management, team work, leadership and decision making through gender sensitization programmes.

Programme Educational Objectives (PEOs)

PEOs	Upon completion of B.A/B.Sc. degree programme, the graduates will be able to	Mission addressed
PEO1	apply appropriate theory and scientific knowledge to participate in activities that support humanity and economic development nationally and globally, developing as leaders in their fields of expertise.	M1& M2
PEO2	inculcate practical knowledge for developing professional empowerment and entrepreneurship and societal services.	M2, M3, M4 & M5
PEO3	pursue lifelong learning and continuous improvement of the knowledge and skills with the highest professional and ethical standards.	M3, M4, M5 & M6

Programme Outcomes (POs)

POs	Upon completion of B.Sc. Degree Programme, the graduates will be able to:	Mapping with PEOs
PO1	obtain comprehensive knowledge and skills to pursue higher studies in the relevant field of science.	PEO1
PO2	create innovative ideas to enhance entrepreneurial skills for economic independence.	PEO2
PO3	reflect upon green initiatives and take responsible steps to build a sustainable environment.	PEO2
PO4	enhance leadership qualities, team spirit and communication skills to face challenging competitive examinations for a better developmental career.	PEO1 & PEO3
PO5	communicate effectively and collaborate successfully with peers to become competent professionals.	PEO2 & PEO3
PO6	absorb ethical, moral and social values in personal and social life leading to highly cultured and civilized personality	PEO2 & PEO3
PO7	participate in learning activities throughout life, through self-paced and self-directed learning to develop knowledge and skills.	PEO1 & PEO3

Programme Specific Outcomes (PSOs)

PSOs	Upon completion of the B.Sc. Computer Science Programme, the graduates will be able to:	Mapping with POs
PSO1	obtain sufficient knowledge and skills enabling them to undertake further studies in Computer Science and its allied areas on multiple disciplines linked with Computer Science.	PO1
PSO2	evaluate and apply emerging technologies in computer science to develop innovative solutions for real-world problems	PO2
PSO3	develop a range of generic skills helpful in team building, problem solving, technical ability, employment, internships, communication and societal activities.	PO4 & PO7
PSO4	communicate effectively, work collaboratively, and demonstrate ethical and professional attitudes in diverse settings.	PO5 & PO6
PSO5	sensitize various economic issues related to Development, Growth, International Economics, Sustainable Development and Environment	PO3

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Mapping of POs and PSOs

POs	PSO1	PSO2	PSO3	PSO4	PSO5
PO1	M	S	S	S	S
PO2	S	M	S	S	S
PO3	M	S	S	S	M
PO4	S	S	M	S	S
PO5	S	M	S	M	S
PO6	M	S	S	M	S
PO7	S	S	M	S	S

Eligibility Norms for Admission

Those who seek admission to B.Sc. Computer Science must have passed the Higher Secondary Examination (10+2) (Academic / Vocational Stream) conducted by the Government of Tamil Nadu **with Computer Science or Mathematics as one of the subjects** or an examination accepted as equivalent thereto by the syndicate of Manonmaniam Sundaranar University, Tirunelveli, is eligible for admission and the medium of instruction is English.

Duration of the Programme: 3 years

Medium of Instruction: English

Passing Minimum

A minimum of 40% in the external examination and an aggregate of 40% is required. There is no minimum pass mark for the Continuous Internal Assessment.

Components of the B.Sc Computer Science Programme

Part III (Core and Elective Courses)

Core Courses	Core – Theory papers	8 x100	800
	Core Lab Course	7 x100	700
	Discipline Specific Elective - Theory papers	4 x 100	400
	Core Research Project	1 x 100	100
	Total marks		**2000**
Elective Courses	Theory	4x100	400
	Elective Lab Course	1x100	100
	Total marks		**500**
Part III - Total marks			**2500**

- **Core Lab Courses carry 100 marks each.**
- **Practical examination will be conducted at the end of each semester.**

Course Structure

Distribution of Hours and Credits

Curricular Courses:

Course	S I	S II	S III	S IV	S V	S VI	Total	
							H	**C**
Part I Language	6 (3)	6 (3)	6 (3)	6 (3)			24	**12**
Part II English	6 (3)	6 (3)	6 (3)	6 (3)			24	**12**
Part III								
Core Course	5(5)	5(5)	5(5)	5(5)	5(4) + 5(4)	5(4)+ 5(4)	76	**68**
Core Lab Course	5(5)	5(5)	3(3)	5(5)	5(4)	4(3)+ 4(3)		
Core Research Project					5(4)			
Elective /Discipline Specific Elective Courses	4 (3)	4 (3)	4 (3) 2(2)	4 (3)	4 (3)+ 4 (3)	5 (3)+ 5(3)	36	**26**
Part IV								
Non-major Elective	2 (2)	2 (2)					4	**4**
Skill Enhancement Course		2 (2)	2(2) + 2 (2)	2 (2)			8	**8**
Foundation Course	2 (2)						2	**2**
Environmental Studies				2 (2)			2	**2**
Value Education					2 (2)		2	**2**
Internship					(2)		-	**2**
Professional Competency Skill						2 (2)	2	**2**
Total	**30 (23)**	**30 (23)**	**30 (23)**	**30 (23)**	**30 (26)**	**30 (22)**	180	140

Total number of Hours   =   180

Co-curricular Courses

Course	S I	S II	S III	S IV	S V	S VI	Total
LST (Life Skill Training)	-	(1)	-	(1)			2
Skill Development Training (Certificate Course)	(1)						1
Field Project		(1)					1
Specific Value-added Course	(1)		(1)				2
Generic Value-added Course				(1)		(1)	2
MOOC		(1)		(1)			2
Student Training Activity: Clubs & Committees / NSS				(1)			1
Community Engagement Activity: RUN				(1)			1
Human Rights Education					(1)		1
Gender Equity Studies						(1)	1
Total							**14**

Courses Offered

SEMESTER I

Course	Course Code	Title of the Course	Credits	Hours/ Week
Part I	TU231TL1 FU231FL1	Language: Tamil French	3	6
Part II	EU241EL1 EU241EL2 EU241EL3	English: A Stream English: B Stream English: C Stream	3	6
Part III	SU241CC1	Core Course I: Python Programming	5	5
	SU231CP1	Core Lab Course I: Python Programming Lab	5	5
	SU231EC1	Elective Course I: Numerical Methods	3	4
Part IV	SU231NM1 SU241NM1	Non-Major Elective NME I: Office Automation	2	2
	SU231FC1	Foundation Course: Problem Solving Techniques	2	2
		Total	**23**	**30**

SEMESTER II

Course	Course Code	Title of the Course	Credits	Hours/ Week
Part I	TU232TL1 FU232FL1	Language: Tamil French	3	6
Part II	EU242EL1 EU242EL2 EU242EL3	English: A Stream English: B Stream English: C Stream	3	6
Part III	SU242CC1	Core Course II: Data Structure and Algorithms	5	5
	SU232CP1	Core Lab Course II: Data Structure and Algorithms Lab	5	5
	SU232EC1	Elective Course II: Discrete Mathematics	3	4
Part IV	SU232NM1/ SU242NM1	Non-Major Elective NME II: Introduction to HTML	2	2
	SU232SE1	Skill Enhancement Course SEC I: Advanced Excel	2	2
		Total	**23**	**30**

SEMESTER III

Course	Course Code	Title of the Course	Credits	Hours /Week
Part I	TU233TL1 FU233FL1	Language: Tamil French	3	6
Part II	EU233EL1	English	3	6
Part III	SU233CC1	Core Course III: Programming in Java	5	5
	SU233CP1	Core Lab Course III: Programming in Java Lab	3	3
	SU233EC1	Elective Course III: Web Technology	3	4

	SU233EP1	Elective Lab Course I: Web Technology Lab	2	2
Part IV	SU233SE1	Skill Enhancement Course SEC II: Programming in PHP	2	2
	UG23CSE1	Skill Enhancement Course SEC III: Fitness for Wellbeing	2	2
		Total	**23**	**30**

SEMESTER IV

Course	Course Code	Title of the Course	Credits	Hours /Week
Part I	TU234TL1 FU234FL1	Language: Tamil French	3	6
Part II	EU234EL1	English	3	6
Part III	SU234CC1	Core Course IV: .Net Programming	5	5
	SU234CP1	Core Lab Course IV: .Net Programming Lab	5	5
	SU234EC1	Elective Course IV: Software Engineering	3	4
Part IV	UG23CSE2	Skill Enhancement Course SEC IV: Digital Fluency	2	2
	UG234EV1	Environmental Studies (EVS)	2	2
		Total	**23**	**30**

SEMESTER V

Course	Course Code	Title of the Course	Credits	Hours /Week
Part III	SU235CC1	Core Course V: DBMS	4	5
	SU235CP1	Core Lab Course V: DBMS Lab	4	5
	SU235CC2	Core Course VI: Computer Networks	4	5
	SU235RP1	Core Research Project	4	5
	SU235DE1	Discipline Specific Elective I: a) Artificial Intelligence	3	4
	SU235DE2	Discipline Specific Elective I: b) Cloud Computing	3	4
	SU235DE3	Discipline Specific Elective I: c) Internet of Things	3	4
	SU235DE4	Discipline Specific Elective II: a) Virtual Reality	3	4
	SU235DE5	Discipline Specific Elective II: b) Image Processing	3	4
	SU235DE6	Discipline Specific Elective II: c) Computer Graphics	3	4
Part IV	SU235VE1	Value Education	2	2
	SU235IS1	Internship	2	-
		Total	**26**	**30**

SEMESTER VI

Course	Course Code	Title of the Course	Credits	Hours /Week
Part III	SU236CC1	Core Course VII: Operating System	4	5
	SU236CP1	Core Lab Course VII: Unix and Shell	3	4

	Course Code	Title of the Course		
		programming Lab		
	SU236CC2	Core Course VIII: Machine Learning	4	5
	SU236CP2	Core Lab Course VIII: Machine Learning Lab	3	4
	SU236DE1	Discipline Specific Elective III: a) Cryptography	3	5
	SU236DE2	Discipline Specific Elective III: b) Network security	3	5
	SU236DE3	Discipline Specific Elective III: c) Big Data Analytics	3	5
	SU236DE4	Discipline Specific Elective IV: a) Cybersecurity	3	5
	SU236DE5	Discipline Specific Elective IV: b) Blockchain Technologies	3	5
	SU236DE6	Discipline Specific Elective IV: c) Ethical Hacking	3	5
	SU236PS1	Professional Competency Skill: Multimedia Systems	2	2
		Total	**22**	**30**
		TOTAL	**140**	**180**

Co-curricular Courses

Part	Semester	Course Code	Title of the Course	Credit
Part V	I & II	UG232LC1	Life Skill Training I: Catechism	1
		UG232LM1	Life Skill Training I: Moral	
	I	UG231C01 –	Skill Development Training (SDT) - Certificate Course	1
	II	SU232FP1	Field Project	1
	I & III	SU231V01 -	Specific Value-added Course	1+1
	II &IV	-	MOOC	1+1
	III & IV	UG234LC1	Life Skill Training II: Catechism	1
		UG234LM1	Life Skill Training II: Moral	
	IV & VI	GVAC2401 -	Generic Value-added Course	1 +1
	I - IV	UG234ST1	Student Training Activity – Clubs & Committees / NSS	1
	IV	UG234CE1	Community Engagement Activity – RUN	1
	V	UG235HR1	Human Rights Education	1
	VI	UG236GS1	Gender Equity Studies	1
			Total	**14**

Specific Value-added Course

Semester	Course Code	Title of the Course	Credit	Total hours
I	SU231V01	Procedural Language	1	30
I	SU231V02	Upgrading and Repairing PCS	1	30
I	SU231V03	Robotics and its applications	1	30
III	SU233V01	Adobe InDesign CS4	1	30
III	SU233V02	Flutter	1	30
III	SU233V03	2D Animation using Pivot Animator	1	30

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Self-Learning Course

Semester	Course code	Title of the course	Credit
III/V	SU233SL1/ SU235SL1	Adobe Illustrator CS4	1
IV/VI	SU234SL1/ SU236SL1	Web Animation	1

Examination Pattern

Each paper carries an internal component. There is a passing minimum for external component. A minimum of 40% in the external examination and an aggregate of 40% is required.

i. Part I – Tamil, Part II – English, Part III - (Core Course/ Elective Course)

Ratio of Internal and External= 25:75

Continuous Internal Assessment (CIA)

Internal Components and Distribution of Marks

Components	Marks
Internal test (2) - 40 marks	10
Quiz (2) - 20 marks	5
Assignment: (Model Making, Exhibition, Role Play, Seminar, Group Discussion, Problem Solving, Class Test, Open Book Test etc. (Minimum three items per course should be included in the syllabus & teaching plan) (30 marks)	10
Total	**25**

Question Pattern

Internal Test	Marks	External Exam	Marks
Part A 4 x 1(No choice)	4	Part A 10 x 1 (No choice)	10
Part B 2 x 6 (Internal choice)	12	Part B 5 x 6 (Internal choice)	30
Part C 2 x 12 (Internal choice)	24	Part C 5x 12 (Internal choice)	60
Total	**40**	**Total**	**100**

ii. Lab Course:

Ratio of Internal and External= 25:75

Total: 100 marks

Internal Components and Distribution of Marks

Internal Components	Marks
Performance of the Experiments	10
Regularity in attending practical and submission of records	5
Record	5
Model exam	5
Total	**25**

Question pattern

External Exam	Marks
Major Practical	75
Minor Practical / Spotters /Record	
Total	**75**

iii. Core Research Project

Ratio of Internal and External = 25:75

Components	Marks
Internal	25
External	
Core Research Project Report	40

Viva voce	35
Total	**100**

Part IV

   i. Non-major Elective, Skill Enhancement Course I & II, Foundation Course, Value Education, Professional Competency Skill

     Ratio of Internal and External = 2**5: 75**

Internal Components and Distribution of Marks

Components	Marks
Internal test (2) – 25 marks	10
Quiz (2) – 20 marks	5
Assignment: (Model Making, Exhibition, Role Play, Album, Group Activity, etc. (Minimum three items per course)	10
Total	**25**

Question Pattern

Internal Test	Marks	External Exam	Marks
Part A 2 x 2 (No Choice)	4	Part A 5 x 2 (No Choice)	10
Part B 3 x 4 (Open choice **Three** out of **Five**)	12	Part B 5 x 4 (Open choice any **Five** out of **Eight**)	20
Part C 1 x 9 (Open choice **One** out of **Three**)	9	Part C 5 x 9 (Open choice any **Five** out of **Eight**)	45
Total	**25**	**Total**	**75**

  ii. Skill Enhancement Course III & IV

     Digital Fluency

Components	Marks
Internal	
Quiz (15 x 1)	15
Lab Assessment (5 x 2)	10
Total	**25**
External	
Practical (2 x 25)	50
Procedure	25
Total	**75**

   Fitness and Wellbeing

Components	Marks
Internal	
Quiz (15 x 1)	15
Exercise (2 x 5)	10
Total	**25**
External	
Written Test: Part A: Open choice – 5 out of 8 questions (5 x 5)	25
Part B: Open choice – 5 out of 8 questions (5 x 10)	50
Total	**75**

  iii. Environmental Studies

     Internal Components

Component	Marks
Project Report	15
Viva voce	10
Total	**25**

Question Pattern

Internal Test	Marks	External Exam	Marks
Part A 2 x 2 (No Choice)	4	Part A 5 x 2 (No Choice)	10
Part B 3 x 4 (Open choice **Three** out of **Five**)	12	Part B 5 x 4 (Open choice any **Five** out of **Eight**)	20
Part C 1 x 9 (Open choice **One** out of **Three**)	9	Part C 5 x 9 (Open choice any **Five** out of **Eight**)	45
Total	**25**	**Total**	**75**

iv. Internship

Components	Marks
Industry Contribution	50
Report & Viva-voce	50
Total	**100**

Co-Curricular Courses:

i. Life Skill Training: Catechism & Moral, Human Rights Education & Gender Equity Studies

Internal Components

Component	Marks
Project - Album on current issues	25
Group Activity	25
Total	**50**

External Components

Component	Marks
Written Test: Open choice – 5 out of 8 questions (5 x 10)	50
Total	**50**

ii. Skill Development Training - Certificate Course:

Components	Marks
Attendance & Participation	50
Skill Test	50
Total	**100**

iii. Field Project:

Components	Marks
Field Work	50
Field Project Report & Viva-voce	50
Total	**100**

iv. Specific Value-Added Courses & Generic Value-Added Courses:

Components	Marks
Internal	25
External	75
Total	**100**

v. Student Training Activity: Clubs and Committees

Compulsory for all I & II year students (1 credit).

Component	Marks
Attendance	25
Participation	75
Total	**100**

vi. Community Engagement Activity: Reaching the Unreached Neighbourhood (RUN)

Components	Marks
Attendance & Participation	50
Field Project	50
Total	**100**

vii. Self-Learning Course

Internal Test	Marks	External Exam	Marks
Part A 2 x 2 (No Choice)	4	Part A 5 x 2 (No Choice)	10
Part B 3 x 4 (Open choice **Three** out of **Five**)	12	Part B 5 x 4 (Open choice any **Five** out of **Eight**)	20
Part C 1 x 9 (Open choice **One** out of **Three**)	9	Part C 5 x 9 (Open choice any **Five** out of **Eight**)	45
Total	**25**	**Total**	**75**

Outcome Based Education (OBE)

(i) Knowledge levels for assessment of Outcomes based on Blooms Taxonomy

S. No.	Level	Parameter	Description
1	KI	Knowledge/Remembering	It is the ability to remember the previously learned
2	K2	Comprehension/Understanding	The learner explains ideas or concepts
3	K3	Application/Applying	The learner uses information in a new way
4	K4	Analysis/Analysing	The learner distinguishes among different parts
5	K5	Evaluation/Evaluating	The learner justifies a stand or decision
6	K6	Synthesis /Creating	The learner creates a new product or point of view

(ii) Weightage of K – Levels in Question Paper
Number of questions for each cognitive level:

Programme	Assessment	Lower Order Thinking									Higher order thinking			Total number of questions
		K1			K2			K3			K4, K5, K6			
	Part	A	B	C	A	B	C	A	B	C	A	B	C	
I UG	Internal	2	1	-	1	1	1	1	-	1	-	-	-	**8**
	External	5	2	1	3	2	2	2	1	2	-	-	-	**20**
II UG	Internal	1	1	-	1	1	1	1	-	1	1	-	-	**8**
	External	5	1	1	4	1	1	-	3	1	1	-	2	**20**
III UG	Internal	1	-	-	1	-	1	1	1	1	1	1	-	**8**
	External	5	1	1	4	1	1	-	3	1	1	-	2	**20**

The levels of assessment are flexible and it should assess the cognitive levels and outcome attainment.
Evaluation

i. The performance of a student in each course is evaluated in terms of percentage of marks with a provision for conversion to grade points.

ii. Evaluation of each course shall be done by Continuous Internal Assessment (CIA) by the course teacher as well as by an end semester examination and will be consolidated at the end of the semester.

iii. There shall be examinations at the end of each semester, for odd semesters in October/November; for even semesters in April/ May.
iv. A candidate who does not pass the examination in any course(s) shall be permitted to reappear in such failed course(s) in the subsequent examinations to be held in October/ November or April/May. However, candidates who have arrears in practical examination shall be permitted to reappear for their areas only along with regular practical examinations in the respective semester.
v. Viva-voce: Each project group shall be required to appear for Viva -voce examination in defence of the project.
vi. The results of all the examinations will be published in the college website.

Conferment of Bachelor's Degree

A candidate shall be eligible for the conferment of the Degree of Bachelor of Arts / Science / Commerce only if the minimum required credits for the programme thereof (140 + 18 credits) is earned.

Grading System

For the Semester Examination:

Calculation of Grade Point Average for End Semester Examination:

$$\text{GPA} = \frac{\text{Sum of the multiplication of grade points by the credits of the course}}{\text{Sum of the credits of the courses (passed) in a semester}}$$

For the entire programme:

Cumulative Grade Point Average (CGPA) $\Sigma_n\Sigma_i C_{ni}G_{ni} / \Sigma_{ni}\Sigma_i C_{ni}$

$$\text{CGPA} = \frac{\text{Sum of the multiplication of grade points by the credits of the entire programme}}{\text{Sum of the credits of the courses of the entire programme}}$$

Where ,
C_i - Credits earned for course i in any semester
G_i - Grade point obtained for course i in any semester
n   - semester in which such courses were credited

Final Result

Conversion of Marks to Grade Points and Letter Grade

Range of Marks	Grade Points	Letter Grade	Description
90-100	9.0-10.0	O	Outstanding
80-89	8.0-8.9	D+	Excellent
75-79	7.5-7.9	D	Distinction
70-74	7.0-7.4	A+	Very Good
60-69	6.0-6.9	A	Good
50-59	5.0-5.9	B	Average
40-49	4.0-4.9	C	Satisfactory
00-39	0.0	U	Re-appear
ABSENT	0.0	AAA	ABSENT

Overall Performance

CGPA	Grade	Classification of Final Result
9.5-10.0	O+	First Class – Exemplary*
9.0 and above but below 9.5	O	
8.5 and above but below 9.0	D++	First Class with Distinction*
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	

7.0 and above but below 7.5	A++	First Class
6.5 and above but below 7.0	A+	
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	Second Class
5.0 and above but below 5.5	B	
4.0 and above but below 5.0	C	Third Class
0.0 and above but below 4.0	U	Re-appear

*The candidates who have passed in the first appearance and within the prescribed semester are eligible for the same.

SEMESTER I
CORE COURSE I: PYTHON PROGRAMMING

Course Code	L	T	P	S	Credits	Inst. Hours	Total	Marks		
								CIA	External	Total
SU241CC1	**4**	**1**	**-**	**-**	**5**	**5**	**75**	**25**	**75**	**100**

Prerequisite:

Basic Knowledge of Programming Concept.

Learning Objectives:

1. To understand the syntax and semantics of Python programming language.
2. To know the usage of usage of modules and files

Course Outcomes

On the successful completion of the course, student will be able to:	
1.	recall python syntax, basic structures and control flow statements	**K1**
2.	understand to analyze and debug python code	**K2**
3.	write python scripts to solve specific problems	**K3**
4.	apply python in creating simple applications or scripts for automation	**K3**
5.	create reusable python modules or packages for broader use	**K6**

K1 - Remember; **K2** - Understand; **K3** – Apply; **K6**-Create

Units	Contents	No. of Hours
I	Basics of Python Programming: History of Python – Features of Python – Literal – Constants - Variables – Identifiers - Keywords - Built-in Data Types - Output Statements - Input Statements - Comments - Indentation – Operators. Python Arrays: Defining and Processing Arrays – Array methods.	**15**
II	Control Statements: Selection/Conditional Branching Statements: if, if-else, nested if and if-elif-else Statements. Iterative Statements: while loop, for loop, else suite in loop and nested loops. Jump Statements: break, continue and pass Statements.	**15**
III	Functions: Function Definition – Function Call – Variable Scope and its Lifetime - Return Statement. Function Arguments: Required Arguments, Keyword Arguments, Default Arguments and Variable Length Arguments - Recursion. Python Strings: String Operations - Immutable Strings - Built-in String Methods and Functions - String Comparison. Modules: Import Statement - The Python Module – dir() Function – Modules and Namespace – Defining our own Modules.	**15**
IV	Lists: Creating a list - Access values in List - Updating values in Lists - Nested Lists - Basic List Operations - List Methods. Tuples: Creating, Accessing, Updating and Deleting Elements in a tuple – Nested tuples – Difference between Lists and Tuples. Oops Concepts: Class - Object – Constructors - Types of Variables - Types of Methods. Inheritance: Single Inheritance -Multiple Inheritance - Multi-level Inheritance - Hierarchical and Hybrid Inheritance. Polymorphism: With Functions and Objects - With Class Methods. Abstraction: Abstract Classes.	**15**
V	Python File Handling: Types of files in Python - Opening and Closing Files - Reading and Writing Files: write() and writelines() Methods - append() Method – read() and readlines() Methods – with keyword –	**15**

Splitting words – File methods - File Positions - Renaming and Deleting Files.	
Total	**75**

Self Study	Operators

Textbooks
1. ReemaThareja, 2017. *Python Programming using Problem Solving Approach*, (1st Edition), Oxford University Press.
2. Dr. R. NageswaraRao, 2017. *Core Python Programming*, (1st Edition), Dream Tech Publishers.
3. Micheal T. Goodrich, 2023. *Data Structures and Algorithms in Python*, (1st Edition), DreamTech Press.

Reference Books
1. VamsiKurama, 2018. *Python Programming: A Modern Approach*, (Kindle Edition), Pearson Education.
2. Mark Lutz, 2013. *Learning Python*, (5th Edition), O' Reilly Media, Inc.
3. Adam Stewarts, 2017. *Python Programming*, CreateSpace Independent Publishing Platform.
4. Fabio Nelli, 2015. *Python Data Analytics*, (1st Edition), Apress Publication.
5. Kenneth A. Lambert, 2024. *Fundamentals of Python: First Programs*, (3rd Edition), CENGAGE Publication.

Web Resources
1. https://www.programiz.com/python-programming
2. https://www.guru99.com/python-tutorials.html
3. https://www.w3schools.com/python/python_intro.asp
4. https://www.geeksforgeeks.org/python-programming-language/
5. https://en.wikipedia.org/wiki/Python_(programming_language)

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2	2	2	3	2	2	2	2
CO2	3	3	2	3	2	2	3	3	3	3	2	2
CO3	3	3	2	3	2	2	2	3	3	3	3	2
CO4	3	3	2	3	2	2	2	3	3	3	2	2
CO5	3	3	3	3	3	3	2	3	3	2	3	3
TOTAL	**15**	**14**	**11**	**14**	**11**	**11**	**11**	**15**	**14**	**13**	**12**	**11**
AVERAGE	**3**	**2.8**	**2.2**	**2.8**	**2.2**	**2.2**	**2.2**	**3**	**2.8**	**2.7**	**2.4**	**2.2**

3 – Strong, 2- Medium, 1- Low

SEMESTER I
CORE LAB COURSE I: PYTHON PROGRAMMING LAB

Course Code	L	T	P	S	Credits	Inst. Hours	Total	Marks		
								CIA	External	Total
SU231CP1	-	1	4	-	5	5	75	25	75	100

Prerequisite:
> Basic Knowledge of Programming skill.

Learning Objectives:
1. To acquire programming skills in core Python.
2. To develop the ability to write database applications in Python.

Course Outcomes

On the successful completion of the course, student will be able to:	
1.	remember fundamental python syntax and basic data types , and understand the concepts.	**K1 & K2**
2.	understand the functionality and purpose of control structures and apply the concepts to identify patterns and relationships.	**K2 & K3**
3.	understand the purpose of functions , database and apply this to solve problems.	**K2 & K3**

K1 - Remember; **K2** - Understand; **K3** – Apply

List of Exercises	No. of Hours
Implement the following exercises using Python Programming language: 1. Program using variables, constants, I/O statements in Python. 2. Program using Operators in Python. 3. Program using Conditional Statements. 4. Program using Loops. 5. Program using Jump Statements. 6. Program using Functions. 7. Program using Recursion. 8. Program using Arrays. 9. Program using Strings. 10. Program using Modules. 11. Program using Lists. 12. Program using Tuples. 13. Program using Dictionaries. 14. Program for File Handling.	**75**

Textbooks
1. Reema Thareja, (2017). *Python Programming using problem solving approach.* (1st edition). Oxford University Press.
2. Dr. R. Nageswara Rao, (2017). *Core Python Programming.* (1st edition). Dream tech Publishers.

Reference Books
1. Vamsi Kurama, *Python Programming: A Modern Approach*, Pearson Education.
2. Mark Lutz, *Learning Python*, Orielly.
3. Adam Stewarts, *Python Programming*, online.
4. Fabio Nelli, *Python Data Analytics*, APress.

5. Kenneth A. Lambert, *Fundamentals of Python – First Programs*, CENGAGE Publication.

Web Resources

1. https://www.programiz.com/python-programming
2. https://www.guru99.com/python-tutorials.html
3. https://www.w3schools.com/python/python_intro.asp

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2	2	2	3	2	2	2	2
CO2	3	3	2	3	2	2	3	3	3	3	2	2
CO3	3	3	2	3	2	2	2	3	3	3	2	2
TOTAL	9	8	6	7	6	6	7	9	8	8	6	6
AVERAGE	3	2.7	2	2.3	2	2	2.3	3	2.7	2.7	2	2

3 – Strong, 2- Medium, 1- Low

SEMESTER I
ELECTIVE COURSE I: NUMERICAL METHODS

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU231EC1	3	1	-	-	3	4	60	25	75	100

Pre-requisite:
  Students should know the basic knowledge of programming concept.

Learning Objectives:
1. To realize the basic understanding of numerical algorithms.
2. To implement algorithms to solve mathematical problems on the computer.

Course Outcomes

On the successful completion of the course, student will be able to:	
1.	remember the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for computer problems.	**K1& K2**
2.	understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.	**K2 & K4**
3.	apply this to solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with software applications.	**K3 & K5**
4.	analyze direct methods for solving linear systems.	**K4 & K5**
5.	evaluate methods for solving first and second order ordinary differential equations.	**K3 & K5**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** – Evaluate

Units	Contents	No. of Hours
I	**Fundamentals of Algebraic Equation**: Solution of Algebraic and Transcendental Equations - Bisection Method – Fixed Point Iteration Method – Newton Raphson Method – Linear System of Equations – Gauss Elimination Method. **Chapter 1:** 1.0, 1.3,1.4, 1.6, 2.3	12
II	**Iterative, Interpolation and Approximation:** Iterative Methods - Gauss Jacobi and Gauss Seidel – Interpolation with Unequal Intervals – Lagrange's Interpolation – Newton's Divided Difference Interpolation. **Chapter 2:** 2.5 - 2.7, 4.3 - 4.5	12
III	**Interpolation with Equal Interval:** Difference Operators and Relations. - Interpolation with equal Intervals – Newton's Forward and Backward Difference Formulae. **Chapter 4:** 4.6 **Chapter 5:** 5.1 – 5.2	12
IV	**Numerical Differentiation And Integration:** Approximation of Derivatives using Interpolation Polynomials – Numerical Integration using Trapezoidal, Simpson's 1/3 Rule, Simpson's 1/3 Rule. **Chapter 5:** 5.3 **Chapter 6:** 6.3 - 6.4	12
V	**Initial Value Problems for Ordinary Differential Equations:** Single Step Methods – Taylor's Series Method – Euler's Method – Modified Euler's Method - Runge Kutta Method for solving (first, second, Third) Order Equations. **Chapter 7:** 7.1 -7.4	12
	Total	**60**

Self study	Gauss elimination method
	Newton's divided difference interpolation
	Trapezoidal, Simpson's 1/3 rule
	Runge Kutta method

Textbook

1. Arumugam, S., Thangapandi Isaac, S., Soma Sundaram, A. (2013). *Numerical Analysis with Programming in C*. (4th edition). Bombay: New Gamma Publishing House.

Reference Books

1. Arumugam, S., Thangapandi Isaac, S., Soma Sundaram, A. (2012). *Numerical Methods* (2nd edition). Scitech Publications(India) Pvt Ltd
2. Sastry, S.S. (2003). *Introduction Methods of Numerical Analysis*. (3rd edition). India: Prentice Hall Publication.
3. Gupta, P.P., Malik, G.S., Sanjay Gupta, (1992). *Calculus of Finite Differences and Numerical Analysis*. (16th edition). Bombay: Krishna Prakashan Mandir.

Web Resources

1. https://gdcboysang.ac.in
2. https://www.math.hkust.edu.hk/~machas/numerical-methods.pdf
3. https://perhuaman.files.wordpress.com/2014/07/metodos-numericos.pdf
4. https://www.math.science.cmu.ac.th/docs/qNA2556/ref_na/Katkinson.pdf

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	3	2	2	2	3	2	3	2	2
CO2	3	3	2	2	3	2	3	3	2	3	2	2
CO3	3	3	2	3	3	2	2	3	3	3	2	2
CO4	3	2	2	3	2	3	2	3	2	2	2	2
CO5	3	2	2	3	3	2	2	3	2	2	2	2
TOTAL	15	12	10	14	13	11	11	15	11	13	10	10
AVERAGE	3	2.4	2	2.8	2.6	2.2	2.2	3	2.2	2.6	2	2

3 – Strong, 2- Medium, 1- Low

SEMESTER I
NON-MAJOR ELECTIVE NME I: OFFICE AUTOMATION

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU231NM1/SU241NM1	**1**	**1**	**-**	**-**	**2**	**2**	**30**	**25**	**75**	**100**

Pre-requisite:
Basic skills in Computer operations.

Learning Objectives:
1. To impart training for students in Microsoft Office which has different components like MS Word, MS Excel, MS Access and Power point.
2. To acquire knowledge on editor, spread sheet and presentation software.

Course Outcomes

On the successful completion of the course, student will be able to:	
1.	remember the fundamentals and understand the concepts.	**K1 & K2**
2.	understand the functionality and purpose of commands and apply the concepts.	**K2 & K3**
3.	understand the purpose of functions, database and apply this to solve problems.	**K2 & K3**

K1 - Remember; **K2** - Understand; **K3** – Apply

Units	Contents	No. of Hours
I	**Introductory concepts:** Memory Unit - CPU - Input Devices: Keyboard, Mouse and Scanner. Output Devices: Monitor, Printer. Introduction to Operating Systems & its Features: DOS – UNIX – Windows. Introduction to Programming Languages.	**6**
II	**Word Processing:** Open, Save and Close Word Document; Editing Text – Tools, Formatting, Bullets; Spell Checker - Document Formatting – Paragraph Alignment, Indentation, Headers and Footers, Numbering; Printing – Preview, Options, Merge.	**6**
III	**Spreadsheets:** Excel – Opening, Entering Text and Data, Formatting, Navigating; Formulas – Entering, Handling and Copying; Charts – Creating, Formatting and Printing, Analysis Tables, Preparation of Financial Statements, Introduction to Data Analytics.	**6**
IV	**Database Concepts:** The Concept of Database Management System; Data Field, Records, and Files, Sorting and Indexing Data; Searching Records. Designing Queries, and Reports; Linking of Data Files; Understanding Programming Environment in DBMS; Developing Menu Drive Applications in Query Language (MS – Access).	**6**
V	**Power point:** Introduction to Power Point - Features – Understanding Slide Typecasting & Viewing Slides – Creating Slide Shows. Applying Special Object – Including Objects & Pictures – Slide Transition – Animation Effects, Audio Inclusion, Timers.	**6**
	Total	**30**

Self study	Keyboard, Monitor

Textbook

1.Peter Norton, (2015). *Introduction to Computers.* Tata McGraw-Hill.

Reference Book

1.Jennifer Ackerman Kettel, Guy Hat-Davis, Curt Simmons. (2003). *Microsoft 2003*. Tata McGraw-Hill.

Web Resources

1. Web content from NDL / SWAYAM or open source web resources
2. https://collegedunia.com/courses/diploma-in-office-automation
3. https://nielit.gov.in/sites/default/files/Ranchi/160512_OfficeAutomation.pdf

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2	2	2	3	2	2	2	2
CO2	3	3	2	3	2	2	3	3	3	3	2	2
CO3	3	3	2	3	2	2	2	3	3	3	2	2
TOTAL	9	8	6	7	6	6	7	9	8	8	6	6
AVERAGE	3	2.7	2	2.3	2	2	2.3	3	2.7	2.7	2	2

3 – Strong, 2- Medium, 1- Low

SEMESTER I
FOUNDATION COURSE: PROBLEM SOLVING TECHNIQUES

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU231FC1	1	1	-	-	2	2	30	25	75	100

Pre-requisite:

Students should know the basic of Problem-solving skills.

Learning Objectives:

1. To understand the importance of algorithms and programs, and to know of the basic problem solving strategies.
2. To learn efficient strategies and algorithms to solve standard problems, thus laying a firm foundation for designing algorithmic solutions to problems.

Course Outcomes

On the successful completion of the course, student will be able to:		
1	know the approach and algorithms to solve specific fundamental problems.	**K1**
2	understand the systematic approach to problem solving.	**K2**
3	apply the efficient methods to solve specific problems related to text processing	**K3**

K1 - Remember; **K2** - Understand; **K3** - Apply

Units	Contents	No. of Hours
I	Introduction: History, Characteristics and Limitations of Computer. Hardware/Anatomy of Computer: CPU, Memory, Secondary Storage Devices, Input Devices and Output Devices. Types of Computers: PC, Workstation, Minicomputer, Main Frame and Supercomputer. Software: System Software and Application Software. Programming Languages: Machine Language, Assembly Language, High-level Language, 4GL and 5GL - Features of Good Programming Language. Translators: Interpreters and Compilers.	6
II	Data: Data Types, Input, Processing of Data, Arithmetic Operators, Hierarchy of Operations and Output. Different Phases in Program Development Cycle (PDC). Structured Programming: Algorithm: Features of Good Algorithm, Benefits and Drawbacks of Algorithm. Flowcharts: Advantages and Limitations of Flowcharts, When to use Flowcharts, Flowchart Symbols and Types of Flowcharts. Pseudocode: Writing a Pseudocode. Coding, Documenting and Testing a Program: Comment Lines and Types of Errors. Program design: Modular Programming.	6
III	Selection Structures: Relational and Logical Operators - Selecting from Several Alternatives – Applications of Selection Structures. Repetition Structures: Counter Controlled Loops –Nested Loops – Applications of Repetition Structures.	6
IV	Data: Numeric Data and Character Based Data. Arrays: One Dimensional Array - Two Dimensional Arrays – Strings as Arrays of Characters.	6
V	Data Flow Diagrams: Definition, DFD Symbols and Types of DFDs. Program Modules: Subprograms - Value and Reference Parameters - Scope of a Variable - Functions – Recursion. Files: File Basics - Creating and Reading a Sequential File - Modifying Sequential Files.	6
	Total	**30**

Self study	DFD symbols and types of DFDs

Textbook

1.Stewart Venit, (2010). *Introduction to Programming: Concepts and Design*. (4th edition). Dream Tech Publishers.

Reference Books

1. Greg W. Scragg, *Problem Solving with Computers*, Jones & Bartlett 1st edition, 1996.
2. George Polya, Jeremy Kilpatrick, *The Stanford Mathematics Problem Book: With Hints and Solutions*, Dover Publications, 2009 (Kindle Edition 2013).

Web Resources

1. https://www.codesansar.com/computer-basics/problem-solving-using-computer.htm
2. http://www.nptel.iitm.ac.in/video.php?subjectId=106102067
3. http://utubersity.com/?page_id=876
4. https://www.creative-biolabs.com/drug-discovery/diagnostics/array-technique.Htm
   #:~:text=Among%20all%20kinds%20of%20in,most%20important%20detection%20technology%20modules.
5. https://www.geeksforgeeks.org/algorithms-gq/pattern-searching/

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	2	2	3	3	3	2	3	2
CO2	3	2	3	3	2	2	3	3	2	2	2	2
CO3	3	3	2	3	2	3	2	2	3	2	2	3
TOTAL	9	8	7	8	6	7	8	8	8	6	7	7
AVERAGE	3	2.6	2.3	2.6	2	2.3	2.6	2.6	2.6	2	2.3	2.3

3 – Strong, 2- Medium, 1- Low

SEMESTER I
SPECIFIC VALUE-ADDED COURSE I: PROCEDURAL LANGUAGE

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU231V01	2	-	-	-	1	2	30	25	75	100

Prerequisite:

     Basic knowledge of programming concept.

Learning Objectives:

1. To familiarize the students with basic concepts of computer programming and developer tools.
2. To develop the skill of programming by learning the basic structure and methods.

Course Outcomes

On the successful completion of the course, student will be able to:		
1.	remember the basic fundamentals of C and understand theconcepts.	**K1& K2**
2.	understand the functionality and purpose of control structures and apply the concepts in programming.	**K2 & K3**
3.	understand the various programming constructs and implement it to perform specific task.	**K2 & K3**

K1 - Remember; **K2** - Understand; **K3** – Apply

Units	Contents	No. of Hours
I	**Introduction to Computing:** Introduction – Components of a Computer – Concept of Hardware and Software – Art of Programming through Algorithms and Flowcharts. **Overview of C:** History of C – Importance of C – Sample Programs 1, 2, 3, 4, 5 – Basic Structure – Programming Style – Executing a C Program**.**	6
II	**Control Statements:** Conditional execution – Iterations – Multiple Selection. Expressing Computations. **Basic Values and Data:** The abstract state machine – Basic types – Specifying values – Implicit conversions – Binary representations.	6
III	**Derived Data Types:** Arrays – Structures. **Functions:** Simple functions – main is special – Recursion. **C Library Functions:** General properties of the C library and its functions – String processing and conversion – Runtime environment settings – Program termination and assertions.	6
IV	**Pointers:** Pointer operations – Pointers and Structures – Pointers and arrays – Function pointers. **Function – Like Macros:** Working of function-like macros – Argument checking – Accessing the calling context – Default arguments.	6
V	**Files:** Introduction - Defining and opening a file – Closing a file – Input/Output operations on files – Error handling during I/O operations – Random access to files.	6
	Total	30

Textbooks

1. Jens Gustedt (2019), *Modern C*. (2nd Edition). Publisher(s): Manning Publications. ISBN: 9781617295812.
2. Balagurusamy, E. (2019). Programming in ANSI C. (8th edition). New Delhi: Tata McGraw Hill Education Private Limited.

Reference Books

1. King, K.N. (2008). *C Programming: A Modern Approach.* (2nd edition). New York: W.W. Norton & Company.
2. Stephen Prata, (2004). *C Primer Plus.* (5th edition). New York: Addison-Wesley Publication.
3. Paul Deitel, & Harvey Deitel, (2009). *How to Program C.* (6th edition). New Delhi: PHI Learning Private Limited.

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2	2	2	3	2	2	2	2
CO2	3	3	2	3	2	2	3	3	3	3	2	2
CO3	3	3	2	3	2	2	2	3	3	3	3	2
CO4	3	3	2	3	2	2	2	3	3	3	2	2
CO5	3	3	3	3	3	3	2	3	3	2	3	3
TOTAL	15	14	11	14	11	11	11	15	14	13	12	11
AVERAGE	3	2.8	2.2	2.8	2.2	2.2	2.2	3	2.8	2.7	2.4	2.2

3 – Strong, 2- Medium, 1- Low

SEMESTER I
SPECIFIC VALUE -ADDED COURSE II: UPGRADING AND REPAIRING PCS

Course Code	L	T	P	S	Credit	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU231V02	2	-	-	-	1	2	30	25	75	100

Prerequisite:

Basic understanding of computer hardware and operating systems.

Learning Objectives:

1. To understand fundamental concepts of computer hardware, software, and networking.
2. To learn practical skills for troubleshooting and maintaining computer systems.

Course Outcomes

On the successful completion of the course, students will be able to:	
1.	understand PC development, components, and system design principles comprehensively.	K1&K2
2.	apply skills in building, upgrading, diagnosing, and maintaining PC systems adeptly.	K3
3.	analyze processor types, specifications, upgrades, and troubleshooting methods effectively.	K4
4.	evaluate motherboard components, buses, BIOS, and selection criteria proficiently.	K5
5.	examine memory types, performance, upgrades, and troubleshooting techniques thoroughly.	K5

K1 - Remember; **K2** - Understand; **K3** – Apply; K4 – Analyze; **K5** - Evaluate

Units	Contents	No. of Hours
I	Development of the PC: Computer History: Before Personal Computers - Modern Computers - History of the PC. PC Components, Features and System Design: Define PC - System Types – System Components.	6
II	Processor Types and Specifications: PC Processor Evolution – Processor Specifications – Processor Features - Processor Manufacturing – Processor Socket and Slot Types – Processor Code Names – Intel P6(686) Processors – Processor Upgrades – Processor Troubleshooting Techniques.	6
III	Motherboard and Buses: Motherboard Connectors - Types of I/O Buses – Motherboard Selection Criteria. BIOS Basics: Motherboard ROM BIOS – Upgrading the BIOS – Preboot Environment – BIOS Setup.	6
IV	Memory: Memory Basics – Speed and Performance – Memory Modules – RAM Upgrades - Troubleshooting Memory. Video Hardware: Display Adapters and Monitors – Video Display Adapters. Audio Hardware: Audio Hardware Concepts and Terms – Audio Hardware Features – Motherboard Chipsets with Integrated Audio – Speakers – Microphones.	6

V	Building or Upgrading System: System Components - Hardware and Software Resources – System Assembly and Disassembly – Installing the OS – Troubleshooting New Installations. PC Diagnostics, Testing and Maintenance: Diagnostics Software - The Boot Process – PC Maintenance Tools – Troubleshooting Tips and Techniques.	6
	Total	**30**

Textbook:
1. Scott Mueller's, 2022. *Upgrading and Repairing PCs*, (22nd Edition), Pearson Publishing.

Reference Books:
1. Stuart Yarnold, 2008. *Upgrading and Fixing a PC in Easy Steps*, (8th Edition), In Easy Steps Limited Publisher.
2. Professor of Philosophy John Preston, Scott Mueller, 1996. *Upgrading and Repairing PCs: Academic Edition*, (Academic Edition), Que Education & Training.
3. Marcia Press, Barry Press, 2004. *PC Upgrade and Repair Bible*, (7th Edition), Wiley Publishing.
4. Robert Bruce Thonpson, Barbara Fritchman Thompson, 2003. *PC Hardware in a Nutshell: A Desktop Quick Reference*, (3rd Edition), O'Reilly Media.
5. Scott Mueller, 2009. *Upgrading and Repairing PCs*, (19th Edition), Pearson Education.

Web Resources:
1. Website: Tom's Hardware
2. Website: iFixit
3. Website: PCPartPicker
4. Website: Overclock.net
5. Website: Techspot

**MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2	2	2	3	2	2	2	2
CO2	3	3	2	3	2	2	3	3	3	3	2	2
CO3	3	3	2	3	2	2	2	3	3	3	3	2
CO4	3	3	2	3	2	2	2	3	3	3	2	2
CO5	3	3	3	3	3	3	2	3	3	2	3	3
TOTAL	15	14	11	14	11	11	11	15	14	13	12	11
AVERAGE	3	2.8	2.2	2.8	2.2	2.2	2.2	3	2.8	2.7	2.4	2.2

3 – Strong, 2- Medium, 1- Low

SEMESTER-I
SPECIFIC VALUE-ADDED COURSE III: ROBOTICS AND ITS APPLICATIONS

Course Code	L	T	P	S	Credit	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU231V03	2	-	-	-	1	2	30	25	75	100

Prerequisite:

Fundamental for designing physical parts of robots and understanding motion.

Learning Objectives:

1. To understand the basic concepts of robotics, including definitions and terminologies.
2. To gain an introductory knowledge of machine vision and its integration into robotic systems.

Course Outcomes

On the successful completion of the course, students will be able to:		
1.	classify the various sensors used in robots for better performance.	K1
2.	summarize various industrial and non-industrial applications of robots.	K2
3.	list and explain the basic elements of industrial robots4.	K2
4.	utilize sensors and actuators to develop robotic systems capable of interacting with the environment and responding to stimuli.	K3
5.	analyse robot kinematics and its control methods.	K4

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyze

Units	Contents	No. of Hours
I	Introduction: Definition of 'robo' and 'robotics' – Connection between robotics and some related subjects. Geometric Configuration of Robots: The distinction between arms and vehicles – Degrees of freedom and number of joints – Types of joint – Arm Configuration – Tension structure – Wrists – End effectors.	6
II	Operation, programming and control of industrial robots: Type of industrial robot and their methods of operations – Methods of teaching and programming – Types of controller and program memory – Analysis and control – Programming languages for industrial robots.	6
III	Actuators of robots: Pneumatic actuation – Hydraulic actuation – Hydrostatic circuits – Electric actuation – Mechanical transmission methods. Sensing for robots: Touch sensing – Vision – Types of computer vision.	6
IV	Performance specifications of industrial robots: Geometric configuration: number of axes – Positioning accuracy and repeatability – Angular accuracy and repeatability – Speed – Speed and acceleration accuracy – Control-related specifications.	6
V	Applications of industrial robots: Machine loading – Pallet loading and unloading – Investment casting – Spot welding – Arc welding – Robots in assembly – Integration of industrial robots into the workplace.	6
	Total	30

Textbooks:

1. D. J. Todd, 1986. *Fundamentals of Robot Technology*, (1st Edition), McGraw-Hill Publications.

2. Deb.S.R and Sankha Deb, 2010. *Robotics Technology and Flexible Automation*, (2nd Edition), Tata McGraw Hill Publishing Company Limited.

Reference Books:
1. Klafter.R.D, Chmielewski.T.A, and Noggin's., 1994. *Robot Engineering: An Integrated Approach*, (5th Edition), Prentice Hall of India Pvt. Ltd.
2. Fu.K.S, Gonzalez.R.C&Lee.C.S.G, 2008. Robotics control, sensing, vision and intelligence, (2nd Edition), Tata- McGraw Hill Publications.
3. Yu, 1985. *Industrial Robotics*, (3rd Edition), MIR Publishers Moscow.
4. Thomas R. Kurfess, 2018. *Robotics and Automation Handbook*, (5th Edition), CRC Press.
5. Bruno Siciliano, Oussama Khatib, 2016. *Springer Handbook of Robotics*, (2nd Edition), Springer International Publishing.

Web Resources:
1. Website: Robotics Online
2. Website: IEEE RAS
3. Website: ROS wiki
4. Website: Robotshop Community
5. Website: RPA Academy.

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2	2	2	3	2	2	2	2
CO2	3	3	2	3	2	2	3	3	3	3	2	2
CO3	3	3	2	3	2	2	2	3	3	3	3	2
CO4	3	3	2	3	2	2	2	3	3	3	2	2
CO5	3	3	3	3	3	3	2	3	3	2	3	3
TOTAL	15	14	11	14	11	11	11	15	14	13	12	11
AVERAGE	3	2.8	2.2	2.8	2.2	2.2	2.2	3	2.8	2.7	2.4	2.2

3 – Strong, 2- Medium, 1- Low

SEMESTER II
CORE COURSE II: DATA STRUCTURE AND ALGORITHMS

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU242CC1	**5**	**-**	**-**	**-**	**5**	**5**	**75**	**25**	**75**	**100**

Pre-requisite:
   Basic understanding of programming fundamentals and problem solving skills.

Learning Objectives:
1. To understand the fundamentals of data structure including linked lists, trees, binary search trees, stacks, queues and priority queues.
2. To understand the various algorithm techniques.

Course Outcomes

On the successful completion of the course, students will be able to:		
1.	define data structure and algorithms	**K1**
2.	describe data structures like stack, queue, tree and graph	**K2**
3.	apply data structures in solving the problems	**K2&K3**
4.	use algorithm techniques for solving problems and analyze the time complexity of algorithms.	**K3&K4**
5.	assess various algorithmic techniques and analyze the applications of the algorithm.	**K4&K5**

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyze; **K5** - Evaluate

Units	Contents	No. of Hours
I	Introduction: History of Algorithms – Definitions – Structure and Properties of Algorithms – Development of an algorithm – Data Structures and Algorithms – Data Structure Definition and Classification. Analysis of Algorithms: Efficiency of Algorithms – A priori Analysis – Asymptotic Notations – Time complexity of an Algorithm using O notation – Polynomial versus Exponential Algorithms – Average, Best- and Worst-Case complexities – Analyzing recursive programs. Arrays: Introduction – Array Operations – Number of elements in an array – Representation of arrays in memory – Applications.	**15**
II	Stacks: Introduction – Stack operations – Applications. Queues: Introduction – operations on Queues – Circular Queues – Other Types of Queues – Applications. Linked Lists: Introduction – Singly linked list – Circularly linked list – Doubly linked list –Multiply linked list – Applications.	**15**
III	Trees and Binary Trees: Introduction – Trees: Definition and basic terminology – Representation of Trees – Binary Trees: Basic Terminology and types – Representation of Binary Trees – Binary Tree Traversal – Threaded Binary Tree – Applications. Graphs: Introduction – Definition and Basic Terminology – Representation of Graphs – Graph Traversals – Application.	**15**
IV	Divide and Conquer: General method- Binary Search- Finding the Maximum and Minimum- Merge Sort- Quick Sort. The Greedy Method: General Method – Knapsack Problem – Tree Vertex Splitting-Job	**15**

	Sequencing with Deadlines – Minimum Cost Spanning Trees – Single Source Shortest Paths.	
V	Dynamic Programming: General Method – Multi Stage Graph – All Pairs Shortest Paths – Single Source Shortest Paths– 0/1 Knapsack – Reliability Design – Travelling Salesperson Problem – Flow Shop Scheduling.	**15**
	Total	**75**

Self-study	Data Structure Definition and Classification

Textbooks:
1. G. A.Vijayalakshmi Pai, 2008. Bradley N Miller and David L.Ranum, *Problem Solving with Algorithms and Data Structure*.
2. *Data Structures and Algorithms Concepts, Techniques and Applications*, (1st Edition), Tata McGraw Hill Publishing Company Limited, New Delhi.
3. Ellis Horowitz, Sartaj Sahni, and Sanguthevar Rajasekaran, 2018. *Fundamentals of Computer Algorithms*, (5th Edition), Universities Press (India) Private Limited,

Reference Books:
1. Ellis Horowitz and SartajSahani, 2006. *Fundamentals of Data Structures*, (2nd Edition), Computer Science Press Inc, Galgotia Book Sources Publishers, New Delhi.
2. Dr. Basant Agarwal, Benjamin Baka, 2018. *Hands-On Data Structures and Algorithms*, (2nd Edition), Packt Publishing.
3. Kent D. Lee and Steve Hubbard, 2015. *Data Structures and Algorithms with Python*. (2015th Edition), Springer Nature Publisher.
4. R. Nageswara Rao, 2018. *Core Python Programming,* (2nd Edition), Dreamtech Press.
5. Narasimha Karumanchi, 2015. Data Structure and Algorithmic Thinking with Python, (5th Edition), Tata McGraw Hill.

Web Resources:
1. https://www.programiz.com/python-programming
2. https://www.guru99.com/python-tutorials.html
3. https://www.w3schools.com/python/python_intro.asp
4. https://www.geeksforgeeks.org/python-programming-language/
5. https: https://en.wikipedia.org/wiki/Python_(programming_language)

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2	2	2	3	2	2	2	2
CO2	3	3	2	3	2	2	3	3	3	3	2	2
CO3	3	3	2	3	2	2	2	3	3	3	3	2
CO4	3	3	2	3	2	2	2	3	3	3	2	2
CO5	3	3	3	3	3	3	2	3	3	2	3	3
TOTAL	15	14	11	14	11	11	11	15	14	13	12	11
AVERAGE	3	2.8	2.2	2.8	2.2	2.2	2.2	3	2.8	2.7	2.4	2.2

3 – Strong, 2- Medium, 1- Low

SEMESTER II
CORE LAB COURSE II: DATA STRUCTURE AND ALGORITHMS LAB

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU232CP1	-	-	5	-	5	5	75	25	75	100

Pre-requisite:
     Students should know the basic skills in problem solving.

Learning Objectives:
1. To understand and implement basic data structures.
2. To apply linear and non-linear data structures in problem solving.

Course Outcomes

On the successful completion of the course, student will be able to:	
1.	remember and implement basic data structures linked lists, stacks, queues, trees, graphs.	**K1 & K3**
2.	understand and implement sorting algorithms like bubble, merge, quick sort	**K2 & K3**
3.	applying hash tables and resolving collisions.	**K3**

K1 - Remember; **K2** - Understand; **K3** - Apply

Units	Contents	No. of Hours

	1. Write a program to implement the List ADT using arrays and linked lists.
	 2. Write a programs to implement the following using a singly linked list.
	      Stack ADT
	      Queue ADT
	 3. Write a program that reads an infix expression, converts the expression to postfix form and then evaluates the postfix expression (use stack ADT).
	 4. Write a program to implement priority queue ADT.
	 5. Write a program to perform the following operations:
	      Insert an element into a binary search tree.
	      Delete an element from a binary search tree.
	      Search for a key element in a binary search tree.
	 6. Write a program to perform the following operations
	      Insertion into an AVL-tree
	      Deletion from an AVL-tree
	 7. Write a programs for the implementation of BFS and DFS for a given graph.
	 8. Write a program for implementing the following searching methods:
	      Linear search
	      Binary search.
	 9. Write a program for implementing the following sorting methods:
	      Bubble sort
	      Selection sort
	      Insertion sort
	      Radix sort
		75

Textbooks
1. Mark Allen Weiss, 2014. *Data Structures and Algorithm Analysis in C++,* (4th Edition), Pearson Education.
2. Reema Thareja, 2014. *Data Structures Using C*, (2nd Edition), Oxford Universities Press.

Reference Books
1. Sharma A. K, 2011. *Data Structures using C, (3rd Edition),* Pearson Education India.
2. Mark Allen Weiss, 2018. *Data Structures and Algorithms Analysis in Java, (3rd Edition)*, Pearson, Boston, USA.
3. Brassard G. and Bratley P, 2014. *Fundamentals of Algorithms,* (3rd Edition), PHI, New Delhi.
4. Thomas H. Cormen, Chales E. Leiserson, Ronald L. Rivest, Clifford Stein, 2009. *Introduction to Algorithms,* (3rd Edition). McGraw Hill.
5. Aho, Hopcroft and Ullman, 2003. *Data Structures and Algorithms*, (2nd Edition), Pearson Education.

Web Resources
1. https://onlinelibrary.wiley.com/doi/pdf/10.1002/0470029757.app1
2. https://www.javatpoint.com/travelling-sales-person-problem
3. https://www.programiz.com/dsa
4. https://www.geeksforgeeks.org/learn-data-structures-and-algorithms-dsa-tutorial/
5. https://www.gatevidyalay.com/fractional-knapsack-problem-using-greedy-approach/

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	2	2	3	3	3	2	3	2
CO2	3	2	3	3	2	2	3	3	2	2	2	2
CO3	3	3	2	3	2	3	2	2	3	2	2	3
TOTAL	9	8	7	8	6	7	8	8	8	6	7	7
AVERAGE	3	2.6	2.3	2.6	2	2.3	2.6	2.6	2.6	2	2.3	2.3

3 – Strong, 2- Medium, 1- Low

SEMESTER II
ELECTIVE COURSE II: DISCRETE MATHEMATICS

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU232EC1	3	1	-	-	3	4	60	25	75	100

Pre-requisite:
Basic Concepts in Algebra and Set Theory

Learning Objectives:
1. To learn the concepts of Logic, Functions, Permutations, Combinations and Graph models
2. To motivate the students to solve practical problems using Discrete Mathematics.

Course Outcomes

On the successful completion of the course, student will be able to:	
1.	remember the basic concepts of permutations, combinations, relations and graphs	**K1 & K2**
2.	understand the basic concepts of functions and relations.	**K2**
3.	apply basic counting techniques to solve combinatorial problems.	**K3 & K5**
4.	represent discrete objects and relationships using abstract mathematical structures	**K4 & K5**
5.	apply graphs in a wide variety of models	**K3 & K5**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** – Evaluate

Units	Contents	No. of Hours
I	**Logic:** Propositional logic – Propositions - Conditional Statements – Truth Tables of Compound Propositions - Logical Equivalence - Constructing New Logical Equivalences. **Chapter 1:** Section 1.1 (Pages 1-10 & 16-21) Section 1.2 (Pages 21-29)	12
II	**Functions:** One-to-one and onto Functions - Inverse Functions and Composition of Functions - The Graphs of Functions - Some Important Functions. **Chapter 2:** Section 2.3 (Pages 142-157)	12
III	**Counting**: The basics of Counting - Basic Counting Principles - Permutations and Combinations. **Chapter 5:** Section 5.1 (Pages 335-340 & 344-347) Section 5.3 (Pages 354-362)	12
IV	**Relations**: Relations and their Properties – Functions as Relations - Relation on a Set - Properties of Relation - Combining Relations. **Chapter 7:** Section 7.1 (Pages 459-469)	12
V	**Graphs**: Graph - Undirected Graph - Directed Graph – Multigraph - Pseudo Graph - Simple Graph - General Graph - Degree of Vertex – Theorems - Finite Graph - Order of a Graph - Size of a Graph - Null Graph - Isolated Graph - Isomorphic Graphs. Chapter 11: Section 11.1,11.2	12
	Total	**60**

Self study	Truth Table , Functions

Textbooks

1. Kenneth H. Rosen, 2012. *Discrete Mathematics and Its Applications*, (7th Edition), McGraw Hill.
2. Geetha P, 2023. *Discrete Mathematics*, (2nd Edition), SciTech Publications (India) PVT . LTD.

Reference Books

1. C L Liu, 2018. *Elements of Discrete Mathematics,* (2nd Edition), McGraw Hill.
   Norman L Biggs, 2011. *Discrete Mathematics,* (1st Edition), Pearson, USA.
2. Kenneth Bogart and Robert L Drysdale, 2014. *Discrete Mathematics for Computer Science,* (3rd Edition), Addison-Wesley.
3. Kenneth H. Rosen, 2011. *Discrete Mathematics and its Applications*, (7th Edition), McGraw-Hill.
4. Gupta P.P, Malik G.S, Sanjay Gupta, 1992. *Calculus of Finite Differences and Numerical Analysis*, (16th Edition), Bombay: Krishna Prakashan Mandir.
5. Kenneth H. Rosen, 2022. *Discrete Mathematics and its Applications*, (8th Edition), McGraw-Hill.

Web Resources

1. https://www.slideshare.net/asadfaraz4/intro-to-discrete-mathematics
2. https://slideplayer.com/slide/13589862/
3. https://onlinecourses.nptel.ac.in/noc23_cs109/preview
4. https://www.youtube.com/watch?v=amaH38_mXK4
5. https://www.brilliant.org

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2	2	2	3	2	2	2	2
CO2	3	2	2	2	2	2	2	3	2	2	2	2
CO3	2	3	2	2	2	2	2	3	3	2	2	2
CO4	2	2	2	2	3	2	2	3	2	2	2	3
CO5	3	2	2	2	2	2	2	3	2	2	3	2
TOTAL	13	11	10	10	11	10	10	15	11	10	11	11
AVERAGE	2.6	2.2	2	2	2.2	2	2	3	2.2	2	2.2	2.2

3 – Strong, 2- Medium, 1- Low

SEMESTER II
NON-MAJOR ELECTIVE NME II: INTRODUCTION TO HTML

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU232NM1/ SU242NM1	**1**	**1**	**-**	**-**	**2**	**2**	**30**	**25**	**75**	**100**

Prerequisite:
> Basic knowledge in creating websites.

Learning Objectives:
1. To create a web page, insert a graphic, link, table within a web page.
2. To insert ordered and unordered lists within a web page.

Course Outcomes

On the successful completion of the course, student will be able to:		
1.	recall and recognize HTML tags and their syntax.	**K1& K2**
2.	understand the use of HTML elements like headings, paragraphs, lists and links.	**K2**
3.	apply the concepts in creating web pages and formatting it.	**K3**

K1 - Remember; **K2** - Understand; **K3** – Apply

Units	Contents	No. of Hours
I	**Introduction: Web Basics:** Define Internet – Web Browsers – Define Webpage – **HTML Basics:** Understanding Tags.	**6**
II	Tags for Document Structure (HTML, Head, BodyTag). **Block Level Text Elements:** Headings Paragraph (<p> tag) – Font Style Elements: (bold, italic, font, small, strong, strike, big tags).	**6**
III	**Lists: Types of Lists:** Ordered, Unordered – Nesting Lists – **Other Tags:** Marquee, HR, BR – Using Images – Creating Hyperlinks.	**6**
IV	**Tables:** Creating Basic Table, Table Elements, Caption – Table and Cell Alignment – Rowspan, Colspan – Cellpadding.	**6**
V	**Frames:** Frameset – Targeted Links – Noframe – Forms: Input, Textarea, Select, Option.	**6**
	Total	**30**

Self Study	HTML Basics , Tables

Textbooks

1. Smashing Magazine, 2014. *Mastering HTML5 and CSS3 Made Easy*, Teach U Comp Inc.
2. Thomas Michaud, 2013. *Foundations of Web Design: Introduction to HTML & CSS*, Pearson Education.

Reference Books

1. Jon Duckett, 2010. Beginning HTML, XHTML, CSS and Java Script, (2nd Edition), Wiley Publishing.
2. Jennifer Niederst Robbins, 2013. HTML5 Pocket Reference, (5th Edition), O'Reilly Media.

3. Jennifer Niederst Robbins, 2018. Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics, (5th Edition), O'Reilly Media.
4. Mark Pilgrim, 2010. HTML5: Up and Running, (1st Edition), O'Reilly Media.
5. Elisabeth Robson, Eric Freeman, 2012. Head First HTML and CSS, (2nd Edition), O'Reilly Media.

Web Resources

1. https://www.placementpreparation.io/blog/best-books-to-learn-quantitative-aptitude/
2. https://www.exambazaar.com/blogpost/quantitative-aptitude-books
3. https://www.amazon.in/Quantitative-Aptitude-Competitive-Examinations-Aggarwal/dp/9352534026
4. https://www.w3schools
5. https://www.Learn-HTML.org

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2	2	2	3	2	2	2	2
CO2	3	3	2	3	2	2	3	3	3	3	2	2
CO3	3	3	2	3	2	2	2	3	3	3	2	2
TOTAL	9	8	6	7	6	6	7	9	8	8	6	6
AVERAGE	3	2.7	2	2.3	2	2	2.3	3	2.7	2.7	2	2

3 – Strong, 2- Medium, 1- Low

SEMESTER II
SKILL ENHANCEMENT COURSE SEC - I: ADVANCED EXCEL

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU232SE1	1	-	1	-	2	2	30	25	75	100

Pre-requisite:
Students should know the basic knowledge in office automation / Excel.

Learning Objectives:
1. To learn the advanced features of Excel.
2. To summarise, analyse, explore, and present visualisations of data in the form of charts, graphs.

Course Outcomes

On the successful completion of the course, student will be able to:		
1.	use a wide range of advanced excel functions.	**K1**
2.	understand data validation rules to control data entry	**K2**
3.	presenting data in the form of charts and graphs.	**K3**

K1 - Remember; **K2** - Understand; **K3** - Apply

Units	Contents	No. of Hours
I	Basics of Excel - Customizing Common Options - Absolute and Relative Cells- Protecting and Un-protecting Worksheets and Cells - Working with Functions - Writing Conditional Expressions - Logical Functions - Lookup and Reference Functions - VlookUP with Exact Match, Approximate Match - Nested VlookUP with Exact Match - VlookUP with Tables, Dynamic Ranges - Nested VlookUP with Exact Match - Using VLookUP to Consolidate Data from Multiple Sheets.	**6**
II	Data Validations - Specifying a Valid Range of Values - Specifying a List of Valid Values- Specifying Custom Validations based on Formula - Working with Templates - Designing the Structure of a Template - Templates for Standardization of Worksheets - Sorting and Filtering Data -Sorting Tables - Multiple-level Sorting - Custom Sorting - Filtering Data for Selected View - Advanced Filter Options - Working with Reports Creating Subtotals - Multiple-level Subtotal.	**6**
III	Creating Pivot Tables: Formatting and Customizing Pivot Tables - Advanced Options of Pivot Tables - Pivot Charts - Consolidating Data from Multiple Sheets and Files using Pivot Tables - External Data Sources - Data Consolidation Feature to Consolidate Data - Show Value as % of Row, % of Column, Running Total, Compare with Specific Field - Viewing Subtotal Under Pivot - Creating Slicers.	**6**
IV	More Functions: Date and Time Functions - Text Functions - Database Functions - Power Functions – Formatting using Auto Formatting Option for Worksheets - Using Conditional Formatting Option for Rows, Columns and Cells - WhatIf Analysis - Goal Seek - Data Tables - Scenario Manager.	**6**

V	Charts - Formatting Charts - 3D Graphs - Bar and Line Chart Together - Secondary Axis in Graphs - Sharing Charts with PowerPoint / MS Word, Dynamically - New Features of Excel Sparklines, Inline Charts, Data Charts - Overview of all the New Features.	**6**
	Total	**30**

Self study	Formatting Charts

Textbook
1. Greg Harvey, 2018. *Excel 2019 All-in-One For Dummies,* (1st Edition), For Dummies.

Reference Book
1. Bill Jelen and Michael Alexander, 2019. *Microsoft Excel 2019 Pivot Table Data Crunching,* (1st Edition), McGraw-Hill.
2. Michael Alexander and Richard Kusleika, 2018. *Excel 2019 Bible*, (1st Edition), Wiley.
3. Paul McFedries, 2019. *Excel 2019 Formulas and Functions*, (1st Edition), Microsoft Press.
4. Curtis Frye, 2019. *Microsoft Excel 2019 Step by Step*, (1st Edition). Microsoft Press.
5. Ken Bluttman, 2015. *Excel Formulas and Functions for Dummies*. (1st Edition), For Dummies.

Web Resources
1. https://www.shastacoe.org/uploaded/Dept/it/training_docs/Excel/Excel_Advanced_Training_Packet.pdf
2. https://sscstudy.com/advance-excel-notes-pdf-download/
3. https://www.tutorialspoint.com/advanced_excel/advanced_excel_tutorial.pdf
4. http://www.mcrhrdi.gov.in/group1-2019/Reading%20Material/IT/Adv.Excel%20-%20Handbook(7-6-17).pdf
5. https://www.guru99.com/introduction-to-microsoft-excel.html

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	2	2	2	3	3	3	2	3	2
CO2	3	2	3	3	2	2	3	3	2	3	2	2
CO3	3	2	2	3	2	3	2	2	3	3	2	3
TOTAL	9	7	8	8	6	7	8	8	8	8	7	7
AVERAGE	3	2.3	2.6	2.6	2	2.3	2.6	2.6	2.6	2.8	2.3	2.3

3 – Strong, 2- Medium, 1- Low

SEMESTER I & II
LIFE SKILL TRAINING I: CATECHISM

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
UG232LC1	1	-	-	-	1	1	15	50	50	100

Learning Objectives:

1. To develop human values through value education
2. To understand the significance of humane and values to lead a moral life
3. To make the students realize how values lead to success

Course Outcome

	On the successful completion of the course, student will be able to:	
1	understand the aim and significance of value education	**K1,K2**
2	develop individual skills and act confidently in the society	**K3**
3	learn how to live lovingly through family values	**K3**
4	enhance spiritual values through strong faith in God	**K6**
5	learn good behaviours through social values	**K6**

K1 - Remember **K2**-Understand; **K3**-Apply; **K6**- Create

Units	Contents	No. of Hours
I	**Value Education:** Human Values – Types of Values – Growth – Components – Need and Importance - Bible Reference: Matthew: 5:3-16	**3**
II	**Individual Values: Esther** Vanishing Humanity – Components of Humanity – Crisis – Balanced Emotion – Values of Life - Bible Reference: Esther 8:3-6	**3**
III	**Family Values: Ruth the Moabite** Respecting Parents – Loving Everyone – Confession – True Love Bible Reference: Ruth 2:10-13 **Spiritual Values: Hannah** Faith in God – Wisdom – Spiritual Discipline – Fear in God – Spiritually Good Deeds -Bible Reference: 1 Samuel 1:24-28	**3**
IV	**Social Values: Deborah** Good Behaviour – Devotion to Teachers – Save Nature – Positive Thoughts –The Role of Youth in Social Welfare - Bible Reference: Judges 4:4-9	**3**
V	**Cultural Values**: **Mary of Bethany** Traditional Culture – Changing Culture – Food – Dress – Habit – Relationship – Media – The Role of Youth - Bible Reference: Luke 10:38-42	**3**
	Total	**15**

Textbook:

1. Humane and Values. Holy Cross College (Autonomous), Nagercoil

2. The Holy Bible

SEMESTER I & II
LIFE SKILL TRAINING I: MORAL

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
UG232LM1	1	-	-	-	1	1	15	50	50	100

Learning Objectives:

1. To develop human values through value education
2. To understand the significance of humane and values to lead a moral life
3. To make the students realize how values lead to success

Course Outcomes

	On the successful completion of the course, student will be able to:	
1	understand the aim and significance of value education	K1,K2
2	develop individual skills and act confidently in the society	K3
3	learn how to live lovingly through family values	K3
4	enhance spiritual values through strong faith in God	K6
5	learn good behaviours through social values	K6

K1 - Remember **K2**-Understand; **K3**-Apply; **K6**- Create

Units	Contents	No. of Hours
I	**Value Education:** Introduction – Limitations – Human Values – Types of Values – Aim of Value Education – Growth – Components – Need and Importance	3
II	**Individual Values:** Individual Assessment – Vanishing Humanity – Components of Humanity – Crisis – Balanced Emotion – Values of Life.	3
III	**Family Values:** Life Assessment – Respecting Parents – Loving Everyone – Confession – True Love.	3
IV	**Spiritual Values:** Faith in God – Wisdom – Spiritual Discipline – Fear in God – Spiritually Good Deeds.	3

V	**Social Values:**
	    Good Behaviour – Devotion to Teachers – Save Nature – Positive Thoughts – Drug Free Path – The Role of Youth in Social Welfare.
	Cultural Values:
	    Traditional Culture – Changing Culture – Food – Dress – Habit – Relationship – Media – The Role of Youth.
		3

	Total	15

Textbook:

1.   Humane and Values. Holy Cross College (Autonomous), Nagercoil

SEMESTER III
CORE COURSE III: PROGRAMMING IN JAVA

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU233CC1	**5**	**-**	**-**	**-**	**5**	**5**	**75**	**25**	**75**	**100**

Prerequisite:
> Basic knowledge of programming concept.

Learning Objectives:
1. To understand the basic object-oriented programming concepts and apply them in problem solving.
2. To demonstrate multitasking by using multiple threads and event handling.

Course Outcomes

On the successful completion of the course, students will be able to:		
1.	demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords	**K1&K2**
2.	understand the process of graphical user interface design and implementation using AWT or swings	**K1&K4**
3.	use multithreading concepts to develop inter process communication.	**K2&K3**
4.	demonstrate the behaviour of programs involving the basic programming constructs like control structures, constructors, string handling and garbage collection.	**K2&K4**
5.	develop applets that interact abundantly with the client environment and deploy on the server.	**K6**

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyze; **K6** – Create

Units	Contents	No. of Hours
I	Object Oriented Thinking and Java Basics: Need for OOP Paradigm - Summary of OOP Concept - Java Buzzwords - Data Types - Variables - Scope and lifetime of Variables - Type Conversion and Casting - Arrays - Operators and Expressions - Control Statements - Simple Java Program -Concepts of Classes and Objects - Constructors - Methods - this keyword - Overloading Methods and Constructors - Parameter Passing -Recursion.	**15**
II	Inheritance, Packages and Interfaces: Benefits of Inheritance – Member Access - Types of Inheritance – Method Overriding – Using Super keyword - Using final with Inheritance – Using Abstract Classes. Packages: Defining, Creating and Accessing a Package - Understanding CLASSPATH - Importing Packages – Access Protection. Interfaces: Differences between Classes and Interfaces - Defining an Interface - Implementing Interface - Applying Interfaces -Variables in Interface and Extending Interfaces.	**15**
III	Exception Handling, Multithreading and String Handling: Concepts of Exception Handling - Benefits of Exception Handling - Exception Hierarchy - Usage of try, catch, throw, throws and finally-Built-in Exceptions - Creating own Exception Subclasses. Multithreading:	**15**

	Differences between Multithreading and Multitasking - Thread Life Cycle - Creating Threads - Thread Priorities - Synchronizing Threads - Inter thread Communication- String Handling	
IV	Event Handling and AWT: Events - Event Sources - Event Classes - Event Listeners - Delegation Event Model - Handling Mouse and Keyboard Events - Adapter Classes. AWT: AWT Classes - Working with Frames Windows – AWT Controls – Working with Graphics - Layout Manager – Layout Manager Types.	**15**
V	I/O and Applets: I/O Basics – Reading Console Input – Writing Console Output – Scanner Class – PrintWriter Class. Applets: Two Types of Applets – Applets Architecture - Differences between Applets and Applications – An Applet Skeleton – Simple Applet Display Methods - Creating Applets - Passing Parameters to Applets.	**15**
	Total	**75**

Self-study	OOPS Concept: Inheritance, Abstraction, Encapsulation and Polymorphism

Textbooks
1. Herbert Schildt, 2007. *Java The Complete Reference* (7th Edition), TMH.
2. T. Budd, 2000. *Understanding OOP with Java*, (updated Edition), Pearson Education.

Reference Books
1. J.Nino and F.A. Hosch, 2008. *An Introduction to Programming and OO Design Using Java*, (3rd Edition), John Wiley & Sons.
2. T. Budd, 2002. *An Introduction to OOP*, (3rd Edition), Pearson Education.
3. Y. Daniel Liang, 2018. *Introduction to Java programming*, (10th edition), Pearson Education.
4. R.A. Johnson, 2016. *An Introduction to Java Programming and Object-Oriented Application Development,* (5th Edition), Cengage Learning India Pvt.Ltd
5. Cay.S. Horstmann and Gary Cornell, 2002. *Core Java 2, Vol 1, Fundamentals*, (6th Edition), Pearson Education.

Web Resources
1.https://www.programiz.com/JAVA-programming
2.https://www.javatutorialpoints.com
3.https://www.w3schools.com
4.https://www.geeksforgeeks.org/java-programming-language/
5.https://en.wikipedia.org/wiki/java_(programming_language)

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2	2	2	3	2	2	2	2
CO2	3	3	2	3	2	2	3	3	3	3	2	2
CO3	3	3	2	3	2	2	2	3	3	3	3	2
CO4	3	3	2	3	2	2	2	3	3	3	2	2
CO5	3	3	3	3	3	3	2	3	3	2	3	3
TOTAL	15	14	11	14	11	11	11	15	14	13	12	11
AVERAGE	3	2.8	2.2	2.8	2.2	2.2	2.2	3	2.8	2.7	2.4	2.2

3 – Strong, 2- Medium, 1- Low

SEMESTER III
CORE LAB COURSE III: PROGRAMMING IN JAVA LAB

Course Code	L	T	P	S	Credits	Inst. Hours	Total	Marks		
								CIA	External	Total
SU233CP1	**-**	**1**	**2**	**-**	**3**	**3**	**45**	**25**	**75**	**100**

Prerequisite:
  Basic knowledge of programming skill.

Learning Objectives:
  1. To gain knowledge about Java syntax and semantics to be able to successfully read and write Java computer programs.
  2. To implement interfaces, inheritance, and polymorphism as programming techniques and apply exceptions handling.

Course Outcomes

On the successful completion of the course, students will be able to:		
1.	recall the concepts of object oriented programming such as inheritance, encapsulation and polymorphism in java	**K1**
2.	describe the purpose -and usage of exception handling mechanisms in java.	**K2**
3.	develop and analyse java programs to solve specific problems or implement algorithms using appropriate data structures.	**K3, K4**
4.	evaluate java program using Error handling technique	**K5**
5.	create applet program to implement window based activities	**K6**

 K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyze; **K5-** Evaluate**, K6** – Create

List of Exercises	No. of Hours
1. Define a class called Student with the attributes name, register_number and marks obtained in four subjects (m1, m2, m3, m4). Write a suitable constructor and methods to find the total mark obtained by the student and display the details of the student.	
2. Write a Java program to find the area of a square, rectangle and triangle by (i) Overloading Constructor (ii) Overloading Method.	
3. Write a java program to add two complex numbers. [Use passing object as argument and return object].	
4. Derive another class Student from Student super with data members height and weight. Write a constructor and a method output () to display the details which overrides the super class method output().[Apply method Overriding concept].	**45**
5. Write a java program to create an interface called Demo, which contains a double type constant, and a method called area () with one double type argument. Implement the interface to find the area of a circle.	
6. Write a java program to create a thread using Thread class.	
7. Demonstrate Java inheritance using extends keyword.	
8. Create an applet with four Checkboxes with labels MARUTI-800, ZEN, ALTO and ESTEEM and a Text area object. The program must	

display the details of the car while clicking a particular Checkbox.
9. Write a Java program to throw the following exception,
1) Negative Array Size 2) Array Index out of Bounds
10. Write a java program to create a file menu with option New, Save and Close, Edit menu with option cut, copy, and paste
11. Write a java programming to illustrate Mouse Event Handling

Textbooks
1. Herbert Schildt, 2007. *Java The Complete Reference* (7th Edition), TMH.
2. T. Budd, 2000. *Understanding OOP with Java*, (updated Edition), Pearson Education.

Reference Books
1. J.Nino and F.A. Hosch, 2008. *An Introduction to Programming and OO Design Using Java*, (3rd Edition), John Wiley & Sons.
2. T. Budd, 2002. *An Introduction to OOP*, (3rd Edition), Pearson Education.
3. Y. Daniel Liang, 2018. *Introduction to Java programming*, (10th edition), Pearson Education.
4. R.A. Johnson, 2016. *An Introduction to Java Programming and Object-Oriented Application Development,* (5th Edition), Cengage Learning India Pvt.Ltd
5. Cay.S. Horstmann and Gary Cornell, 2002. *Core Java 2, Vol 1, Fundamentals*, (6th Edition), Pearson Education.

Web Resources
1. https://www.programiz.com/JAVA-programming
2. https://www.javatutorialpoints.com
3. https://www.w3schools.com
4. https://www.geeksforgeeks.org/java-programming-language/
5. https://en.wikipedia.org/wiki/java_(programming_language)

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2	2	2	3	2	2	2	2
CO2	3	3	2	3	2	2	3	3	3	3	2	2
CO3	3	3	2	3	2	2	2	3	3	3	3	2
CO4	3	3	2	3	2	2	2	3	3	3	2	2
CO5	3	3	3	3	3	3	2	3	3	2	3	3
TOTAL	15	14	11	14	11	11	11	15	14	13	12	11
AVERAGE	3	2.8	2.2	2.8	2.2	2.2	2.2	3	2.8	2.7	2.4	2.2

3 – Strong, 2- Medium, 1- Low

SEMESTER III
ELECTIVE COURSE III: WEB TECHNOLOGY

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU233EC1	**3**	**1**	**-**	**-**	**3**	**4**	**60**	**25**	**75**	**100**

Prerequisite:
> Understanding HTML, CSS, and JavaScript forms

Learning Objectives:
1. To understand server-side technologies like databases and server frameworks.
2. To mastering HTML, CSS and JavaScript for webpage creation.

Course Outcomes

On the successful completion of the course, students will be able to:		
1.	recall html tags, css properties, and javascript syntax	**K1**
2.	explain the relationship between html, css and javascript in web development.	**K2**
3.	create well-structured web pages using html and css	**K3**
4.	analyse and evaluate different frameworks and libraries for specific project requirements	**K4, K5**
5.	design and implement responsive web layouts that adopt to various screen sizes and devices	**K6**

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Units	Contents	No. of Hours
I	Introduction to Web Technologies: History of the Web – Understanding Web System Architecture – Understanding 3-Tier Web Architecture – Web Browsers – Overview of HTTP – Exploring Web Technologies. HTML and JavaScript Programming: Introducing HTML Document Structure: The <!DOCTYPE> Element, The <html> Element, The <title> Element, The <body> Element – Creating Headings on a Web Page – Working with Links: Creating a Hyperlink, Setting the Hyperlink Colors, Linking Different Sections of a Web Page.	**12**
II	Working with Images: Inserting an Image on a Web page, Displaying Alternate text for an Image, Adding a Border to an Image, Aligning an Image, Creating Images as Links, Creating Image Maps. Working with Table: Creating a Table, Specifying a Caption to a Table, Adding a Table Heading, Setting the Table Border, Aligning a Table and Cell Content, Setting the Width of a Table and Table Columns, Setting Cell Padding and Cell Spacing, Spanning Rows and Columns, Nesting Tables. Working with Frames: Creating a Frame, Creating Vertical and Horizontal Frames, Setting the Frame Border Thickness, Applying Hyperlink Targets to a Frame.	**12**
III	Introduction to Forms and HTML Controls: Creating an HTML Form, Specifying the Action URL and Methods to Send the Form, Using the HTML Controls. Introducing Cascading Style Sheets: Inline Style, External Style Sheets, Internal Style Sheets, Style Classes, Multiple Styles.	**12**
IV	Introducing JavaScript: Handling Events – Using Variables in JavaScript –	**12**

	Using Array in JavaScript – Creating Objects in JavaScript – Using Operators – Working with Control Flow Statements – Working with Functions.	
V	JavaScript Objects: Window Object - Document object - Browser Object - Form Object - Navigator object - Screen object – Events - Event Handlers – Forms Validations.	**12**
	Total	**60**

Self-study	Form Object, Navigator Object

Textbooks
1. Kogent Learning Solutions Inc, 2012 . *Web Technologies Black Book*. (New Edition). New Delhi: DreamTech Press Publishers.
2. Jon Duckett, 2010. *Beginning HTML, XHTML, CSS and Java Script*, (2nd Edition), Wiley Publishing.

Reference Books
1. Achyut S.Godbole & Atul Kahate, 2008.*Web Technologies TCP/IP to Internet Application Architecture*. (2nd Edition). Tata McGraw Hill Publications, New Delhi.
2. Uttam K.Roy, 2010. *Web Technologies*. (2nd Edition). Oxford University Press, Pune.
3. Craig Grannell, 2008. *The Essential Guide to CSS and Html Web Design*. (2nd Edition). Apress Publication, Bombay.
4. Jennifer Niederst Robbins, 2012. *Learning Web Design*. (4th Edition). O' Reilly Publication, Bombay.
5. David Pitt, 2014. *Modern Web Essential Javascript & Html5*. (2nd Edition), Infoq Publication, New Delhi.

Web Resources
1. https://www.programiz.com/JAVA-programming
2. https://www.javatutorialpoints.com
3. https://www.w3schools.com
4. https://www.geeksforgeeks.org/java-programming-language/
5. https://en.wikipedia.org/wiki/java_(programming_language)

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2	2	2	3	2	2	2	2
CO2	3	3	2	3	2	2	3	3	3	3	2	2
CO3	3	3	2	3	2	2	2	3	3	3	3	2
CO4	3	3	2	3	2	2	2	3	3	3	2	2
CO5	3	3	3	3	3	3	2	3	3	2	3	3
TOTAL	15	14	11	14	11	11	11	15	14	13	12	11
AVERAGE	3	2.8	2.2	2.8	2.2	2.2	2.2	3	2.8	2.7	2.4	2.2

3 – Strong, 2- Medium, 1- Low

SEMESTER III
ELECTIVE LAB COURSE I: WEB TECHNOLOGY LAB

Course Code	L	T	P	S	Credits	Inst. Hours	Total	Marks		
								CIA	External	Total
SU233EP1	-	1	1	-	2	2	30	25	75	100

Prerequisite:

Basic Knowledge of Programming skill.

Learning Objectives:

1. Design web pages using various tags.
2. Write programs using Java Script.

Course Outcomes

On the successful completion of the course, students will be able to:	
1.	recall the basic components and technologies used in web development, such as html, css and javascript.	**K1**
2.	understand and apply css definitions for document presentation.	**K2**
3.	build interactive page using html	**K3**
4.	identify, formulate and analyze problems as well as identify the computing requirements appropriate to their solutions.	**K4**
5.	develop dynamic web pages using client side programming and server side programming.	**K6**

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyze; **K6** – Create

List of Exercises	No. of Hours
HTML 1. Program using tags 2. Program using anchor tag 3. Program using image loading 4. Program using table 5. Program using nested table 6. Program using frames 7. Program using CSS rule 8. Program to create resume 9. Program using controls **JavaScript** 1. Program using operators 2. Program using control statements 3. Program using functions	**30**

Textbooks

1. Kogent Learning Solutions Inc, 2012 . *Web Technologies Black Book*. (New Edition). New Delhi: DreamTech Press Publishers.
2. Jon Duckett, 2010. *Beginning HTML, XHTML, CSS and Java Script*, (2nd Edition), Wiley Publishing.

Reference Books

1. Achyut S.Godbole & Atul Kahate, 2008.*Web Technologies TCP/IP to Internet Application Architecture*. (2nd Edition). Tata McGraw Hill Publications, New Delhi.
2. Uttam K.Roy, 2010. *Web Technologies*. (2nd Edition). Oxford University Press, Pune.

3. Craig Grannell, 2008. *The Essential Guide to CSS and Html Web Design*. (2nd Edition). Apress Publication, Bombay.
4. Jennifer Niederst Robbins, 2012. *Learning Web Design*. (4th Edition). O' Reilly Publication, Bombay.
5. David Pitt, 2014. *Modern Web Essential Javascript & Html5*. (2nd Edition), Infoq Publication, New Delhi.

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4. https://www.geeksforgeeks.org/java-programming-language/
5. https://en.wikipedia.org/wiki/java_(programming_language)

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	2	2	2	2	2	3	2	2	2	2
CO2	3	3	2	3	2	2	3	3	3	3	2	2
CO3	3	3	2	3	2	2	2	3	3	3	3	2
CO4	3	3	2	3	2	2	2	3	3	3	2	2
CO5	3	3	3	3	3	3	2	3	3	2	3	3
TOTAL	15	14	11	14	11	11	11	15	14	13	12	11
AVERAGE	3	2.8	2.2	2.8	2.2	2.2	2.2	3	2.8	2.7	2.4	2.2

3 – Strong, 2- Medium, 1- Low

SEMESTER III
SKILL ENHANCEMENT COURSE II: PROGRAMMING IN PHP

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU233SE1	-	-	2	-	2	2	30	25	75	100

Pre-requisite:
>Basic Knowledge on Web

Learning Objectives:
1. To design and develop dynamic, database-driven web applications using PHP version.
2. To get an experience on various web application development techniques

Course Outcomes

On the successful completion of the course, students will be able to:	
1.	recall and apply PHP syntax to solve programming problems.	**K1, K3**
2.	interpret and analyze PHP code and explain its behaviour.	**K2, K4**
3.	apply PHP scripts to perform specific tasks, such as form processing or database manipulation.	**K3**
4.	manipulate files, sessions and cookies deploy	**K3**
5.	create PHP programs that use various PHP library functions	**K6**

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyse; **K6** - Create

Units	Contents	No. of Hours
I	Introduction to PHP - Basic Knowledge of Websites - Introduction of Dynamic Website - Introduction to PHP - Scope of PHP - XAMPP and WAMP Installation	6
II	PHP Programming Basics - Syntax of PHP - Embedding PHP in HTML -Embedding HTML in PHP. Introduction to PHP Variable - Understanding Data Types - Using Operators - Using Conditional Statements - if(), else if() and else if condition Statement	6
III	switch() Statements -Using the while() Loop - Using the for() Loop - PHP Functions - PHP Functions - Creating an Array - Modifying Array Elements - Processing Arrays with Loops - Grouping Form Selections with Arrays - Using Array Functions	6
IV	PHP Advanced Concepts - Reading and Writing Files - Reading Data from a File	6
V	Managing Sessions and Using Session Variables - Destroying a Session -Storing Data in Cookies - Setting Cookies	6
	Total	**30**

Self-study	Variable and Data Types

Assessment-Internal test and External End Semester Examinations will be conducted as Practical Exams.

Textbooks:
1. Vikram Vaswani, 2017. *PHP A Beginner's Guide*, (Indian Edition), Tata McGraw-Hill, New Delhi.
2. Lynn Beighley, Michael Morrison, 2009. *Head First PHP & MySQL: A Brain-Friendly Guide*, (First Edition), O'Reilly Media, United States of America.

Reference Books:

1. Alan Forbes, 2015. *The Joy of PHP: A Beginner's Guide to Programming Interactive Web Applications with PHP and MySQL*, (3rd Edition), CreateSpace Independent Publishing Platform.
2. Andy Harris, 2015. *PHP5/MYSQL Programming for the Absolute Beginner*, (5th Edition), Thomson Course Technology.
3. Robin Nixon, 2009. *Learning PHP, MySQL and JavaScript*, (2nd Edition), O'reilly Publishers.
4. K.Meena, R.Sivakumar and A.B.Karthick Anand Babu, 2012. *Web Programming Using PHP and MySQL*, (5th Edition), Himalaya Publishing House.
5. Paul Hudson, 2005. *PHP in a Nutshell*, (1st Edition), O' Reilly Publications.

Web Resources:

1. Web resources from NDL Library, E-content from open-source libraries
2. Opensource digital libraries: PHP Programming
3. https://www.w3schools.com/php/default.asp
4. Website: PHP Manual
5. Website: PHP.net

**MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	2	2	2	3	3	3	2	2
CO2	3	3	2	2	2	2	2	3	3	3	2	2
CO3	3	3	2	1	2	2	2	3	3	3	2	2
CO4	3	3	2	1	2	2	2	3	3	3	2	2
CO5	3	3	2	1	2	2	2	3	3	3	2	2
TOTAL	15	15	10	7	10	10	10	15	15	15	10	10
AVERAGE	3	3	2	1.4	2	2	2	3	3	3	2	2

3 – Strong, 2- Medium, 1- Low

SEMESTER III / IV
SKILL ENHANCEMENT COURSE SEC III: FITNESS FOR WELLBEING

Course Code	L	T	P	S	Credits	Total Hours	Marks		
							CIA	External	Total
UG23CSE1	**1**	**-**	**1**	**-**	**2**	**30**	**25**	**75**	**100**

Pre-requisites: Basic understanding of health and wellness concepts

Learning Objectives

1. To understand the interconnectedness of physical, mental, and social aspects of well-being, and recognize the importance of physical fitness in achieving holistic health.
2. To develop proficiency in mindfulness techniques, yoga practices, nutritional awareness, and personal hygiene practices to promote overall wellness and healthy lifestyle.

Course Outcomes

On the successful completion of the course, student will be able to:		
1	know physical, mental, and social aspects of health	**K1**
2	understand holistic health and the role of physical fitness.	**K2**
3	apply mindfulness and yoga for stress management and mental clarity.	**K3**
4	implement proper personal hygiene practices for cleanliness and disease prevention.	**K3**
5	evaluate and implement right nutritional choices.	**K5**

K1-Remember; **K2**-Understand; **K3**-Apply; **K5**-Evaluate

Unit	Contents	No. of Hours
I	**Understanding Health and Physical Fitness** Health – definition- holistic concept of well-being encompassing physical, mental, and social aspects. Physical fitness and its components- muscular strength- flexibility, and body composition. Benefits of Physical Activity- its impact on health and well-being.	**6**
II	**Techniques of Mindfulness** Mind – Mental frequency, analysis of thought, eradication of worries Breathing Exercises – types and its importance Mindfulness –pain management - techniques for practicing mindfulness - mindfulness and daily physical activities.	**6**
III	**Foundations of Fitness** Stretching techniques to improve flexibility. Yoga-Definition, yoga poses (asanas) for beginners, Sun Salutations (Surya Namaskar), Yoga Nidra – benefits of yoga nidra.	**6**
IV	**Nutrition and Wellness** Role of nutrition in fitness - macronutrients, micronutrients - mindful eating practices, balanced diet - consequences of overeating. Components of healthy food. Food ethics.	**6**
V	**Personal Hygiene Practices** Handwashing- techniques, timing, and importance, oral hygiene- brushing,	**6**

	flossing, and dental care, bathing and showering- proper techniques and frequency, hair care- washing, grooming, and maintaining cleanliness, maintaining personal hygiene, dangers of excessive cosmetic use.	
	Total	**30**

Self-study	Balance diet and basic excercises

Textbook:
  1. Bojaxa A. Rosy and Virgin Nithya Veena. V. 2024. *Fitness for Wellbeing*.
Reference Books:
  1. Arul Raja Selvan S. R, 2022. *Yogasanam and Health Science*. Self publisher.
  2. Vision for Wisdom. 2016. *Value Education*. The World Community Service Centre Vethathiri Publications.
  3. WCSC – Vision for Wisdom. 2016. *Paper 1: Yoga and Empowerment*. Vazhga Valamudan Offset Printers Pvt Ltd 29, Nachiappa St, Erode.
  4. Lachlan Sleigh. 2023. *Stronger Together the Family's Guide to Fitness and Wellbeing*. Self Publisher.
  5. William P. Morgan, Stephen E. Goldston. 2013. *Exercise And Mental Health*. Taylor & Francis.

Web Resources:
  1. https://www.google.co.in/books/edition/Psychology_of_Health_and_Fitness/1lYOAwAA BAJ?hl=en&gbpv=1&dq=fitness+for+wellbeing&printsec=frontcover
  2. https://www.google.co.in/books/edition/The_Little_Book_of_Active_Wellbeing/aA6SzgE ACAAJ?hl=en
  3. https://www.google.co.in/books/edition/Physical_Activity_and_Mental_Health/yu96DwA AQBAJ?hl=en&gbpv=1&dq=fitness+for+wellbeing&printsec=frontcover
  4. https://www.google.co.in/books/edition/The_Complete_Manual_of_Fitness_and_Well/pL PAXPLIMv0C?hl=en&gbpv=1&bsq=fitness+for+wellbeing&dq=fitness+for+wellbeing& printsec=frontcover
  5. https://www.google.co.in/books/edition/The_Wellness_Code/4QGZtwAACAAJ?hl=en

SEMESTER III
SPECIFIC VALUE-ADDED COURSE I: ADOBE INDESIGN CS4

Course Code	L	T	P	S	Credit	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU233V01	**2**	**-**	**-**	**-**	**1**	**2**	**30**	**25**	**75**	**100**

Prerequisite:

Basic familiarity with graphic design principles and computer operations.

Learning Objectives:

1. To understand and utilize InDesign CS4 workspace efficiently.
2. To create, format, and publish documents effectively using InDesign CS4.

Course Outcomes

On the successful completion of the course, students will be able to:		
1.	master indesign CS4 interface for efficient document creation.	**K1 & K2**
2.	create, format, and publish documents using advanced features.	**K2**
3.	apply text formatting, styles, and alignment techniques effectively.	**K3 & K4**
4.	prepare documents for printing and export to PDF.	**K3 & K6**
5.	use drawing tools, transform objects, and manage document layout.	**K4**

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyze; **K6** - Create

Units	Contents	No. of Hours
I	Introducing InDesign CS4: Exploring the InDesign CS4 Workspace: The Application Bar – The Menu Bar - The Control Panel – The Tools Panel – The Document Window – The Work Area - The Panel Groups. Working with Custom Workspaces: Creating a Workspace – Saving a Workspace – Deleting a Workspace. Creating a New Document – Saving a Document – Closing the Document and Quitting the Application.	**6**
II	Working with Documents: Opening an Existing Document - Introducing Master Pages: Creating a Master Page – Deleting a Master Page. Working with Text: Creating a Text frame – Adding Text to the Document. Working with the Type on a Path Tool: Creating Type on a Path – Removing Text from the Path.	**6**
III	Performing Basic Formatting Tasks: Changing the Font Size of the Text – Changing the Font Color of the Text – Aligning the text in a Document. Performing Advance Formatting Tasks: Working with Character Styles – Working with paragraph Styles.	**6**
IV	Working with Drawing Tools and Object: Using Shape Tools: Working with Rectangle Tool – Working with Ellipse Tool – Working with Polygon Tool. Using Pencil Tool: Drawing a Freeform Path – Drawing a Closed Path – Editing a Path. Using Pen Tool: Drawing Straight Lines – Drawing Curves. Transforming Objects: Flipping an Object - Rotating an Object – Cropping an Object – Shearing an Object.	**6**
V	Publishing the Document: Creating a Table of Contents: Creating and Applying Styles in a TOC – Importing Styles. Printing a Document:	**6**

Print-previewing a Document – Exploring the Types of Print Options – Saving the Document as a PDF File.	
Total	**30**

Self-study	Creating a Text frame and Adding Text to the Document

Textbook:
1. Vikas Gupta, 2010. *Comdex DTP Course Kit*, (3rd Edition), Dreamtech Press.

Reference Books:
1. Christopher Smith & the AGI Creative Team, 2011. *InDesign CS4 Digital Classroom.* (3rd Edition). Wiley Publication.
2. Galen Gruman, 2009. *Adobe In Design Cs4 Bible*, (Wiley-India Edition), Kay Kay Publication, Delhi.
3. Olav Martin Kvern, David Blatner, Bob Bringhurst, 2012. *Real World Adobe InDesign CS6*, Peachpit Press, California.
4. Michael Murphy, 2010. *Adobe InDesgn CS4 Styles: How to Create Better, FasterText*, (3rd Edition), Pearson Education.
5. Steve Jhonson, Perspection Inc, 2008. *Adobe InDesign CS4 on Demand*, (5th Edition), Pearson Education.

Web Resources:
1. https://helpx.adobe.com/support/indesign.html
2. https://community.adobe.com/
3. https://www.linkedin.com/learning/
4. https://www.udemy.com/
5. https://www.youtube.com/

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	2	2	2	3	3	3	2	2
CO2	3	3	2	2	2	2	2	3	3	3	2	2
CO3	3	3	2	1	2	2	2	3	3	3	2	2
CO4	3	3	2	1	2	2	2	3	3	3	2	2
CO5	3	3	2	1	2	2	2	3	3	3	2	2
TOTAL	**15**	**15**	**10**	**7**	**10**	**10**	**10**	**15**	**15**	**15**	**10**	**10**
AVERAGE	**3**	**3**	**2**	**1.4**	**2**	**2**	**2**	**3**	**3**	**3**	**2**	**2**

3 – Strong, 2- Medium, 1- Low

SEMESTER III
SPECIFIC VALUE-ADDED COURSE II: FLUTTER

Course Code	L	T	P	S	Credit	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU233V02	**2**	**-**	**-**	**-**	**1**	**2**	**30**	**25**	**75**	**100**

Prerequisite:

Basic knowledge of programming concepts.

Learning Objectives:

1. To learn about the features and installation of Flutter
2. To develop simple mobile applications in Flutter using Dart language

Course Outcomes

On the successful completion of the course, students will be able to:		
1.	build simple flutter application using simple widgets and layouts	**K1 & K4**
2.	explain flutter applications using dart packages	**K2**
3.	install flutter in android studio.	**K3**
4.	construct flutter application using database	**K6**
5.	build animation on flutter	**K6**

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** – Analyze;**K6** - Create

Units	Contents	No. of Hours
I	Introduction to Flutter: Features of Flutter - Advantages of Flutter - Disadvantages of Flutter. Flutter Installation - Installation in Windows - Installation in Mac OS - Creating Simple Application in Android Studio - Architecture of Flutter Applications.	**6**
II	Flutter Basics: Widgets – Gestures - Concept of State – Layers - Introduction to Dart Programming - Variables and Data types - Decision Making and Loops. Functions - Object Oriented Programming. Introduction to Widgets - Widget Build Visualization.	**6**
III	Introduction to Layouts: Type of Layout Widgets - Single Child Widgets - Multiple Child Widgets - Advanced Layout Application - Introduction to Gestures - Statement Management in Flutter. Ephemeral State Management - Application State - Scoped Model - Navigation and Routing.	**6**
IV	Animation on Flutter: Introduction to Animation Based Classes - Work flow of the Flutter Animation - Working Application - Android Specific Code on Flutter - Introduction to Package - Types of Packages - Using a Dart Package - Develop a Flutter Plugin Package - Accessing Rest API - Basic Concepts - Accessing Product service API	**6**
V	Database Concepts: SQLite- Cloud Fire Store - Internalization on Flutter - Using intl Package - Testing on Flutter - Types of Testing - Widget Testing - Steps Involved - Working Example – Deployment – Android Application - IOS Application - Development Tools - Widget Sets - Flutter Development with Visual Studio Code - Dart DevTools- Flutter SDK	**6**
	Total	**30**

Self-study	Advantages of Flutter and Type of Layout Widgets

Textbooks
1. Marco L. Napoli, 2019. *Beginning Flutter Paperback – Illustrated Paperback* (1st Edition), Wrox Publisher.
2. Deepti Chopra & Roopal Khurana, 2023. *Flutter & Dart: Up & Running: Build Native Apps for both iOS and Android using a Single Codebase Paperback*. (3rd Edition), BPB Publications.

Reference Books
1. Deven Joshi, 2023. *Building Cross-Platform Apps with Flutter and Dart: Build scalable apps for Android, iOS, and web from a single codebase*, (1st Edition), BPB Publications.
2. Hans Kokx, 2023, *Flutter for Jobseekers: Learn Flutter and take your cross-platform app development skills to the next level*, (3rd Edition), Wrox Publishing.
3. Simone Alessandria, Brian Kayfitz, 2021. *Flutter Cookbook: Over 100 proven techniques and solutions*, (Kindle Edition), Packt Publishing.
4. Alberto Miola, 2023. *Flutter Complete Reference 2.0: The ultimate reference for Dart and Flutter*, (4th Edition), Alberto Miola Publisher.
5. Eric Windmill, 2020. *Flutter in Action*, (5th Edition), Manning Publisher.

Web Resources:
1. Website: Flutter.dev
2. Channel: Flutter
3. Flutter GitHub
4. Flutter Weekly
5. Stack Overflow

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	2	2	2	3	3	3	2	2
CO2	3	3	2	2	2	2	2	3	3	3	2	2
CO3	3	3	2	1	2	2	2	3	3	3	2	2
CO4	3	3	2	1	2	2	2	3	3	3	2	2
CO5	3	3	2	1	2	2	2	3	3	3	2	2
TOTAL	15	15	10	7	10	10	10	15	15	15	10	10
AVERAGE	3	3	2	1.4	2	2	2	3	3	3	2	2

3 – Strong, 2- Medium, 1- Low

SEMESTER III
SPECIFIC VALUE-ADDED COUERSE III: 2D ANIMATION USING PIVOT ANIMATOR

Course Code	L	T	P	S	Credit	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU233V03	**2**	**-**	**-**	**-**	**1**	**2**	**30**	**25**	**75**	**100**

Prerequisite:
Understanding of basic animation principles.

Learning Objectives:
1. To understand the basic 2D animation skills
2. To demonstrate animation using pivot animator.

Course Outcomes

On the successful completion of the course, students will be able to:		
1	understand the software layout and controls.	**K1 & K2**
2	learn to create and modify figures for animation.	**K2**
3	master in between, onion skinning, and auto-easing.	**K3 & K4**
4	utilize multi-figure selection, backgrounds, and text objects.	**K4**
5	learn to export animations in various formats.	**K3 & K6**

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyze; **K6** – Create

Units	Contents	No. of Hours
I	Getting Started - Interface at a Glance - Positioning Figure - Canvas Zoom - Figure Controls - Animation Frame Controls - Saving & Opening Animations.	**6**
II	Playing an Animation - Creating Figure Types - Edit Mode - Polygon Fill - Segment Gradients.	**6**
III	Figure Outlines - Adding Sprite Images - Modifying Existing Figure Types - STK Files - Window Transparency	**6**
IV	Onion Skins - Frame Inbetweening - Creating a Basic Inbetweening Sequence - Auto-Easing - Adding Inbetween Frames to the Timeline -Multi-figure Selection -Joining Figures - Backgrounds - Sprites - Text Objects.	**6**
V	Speech Bubbles - Virtual Camera - Options - Exporting an Animation -Animated GIF - Animated PNG Video - Separate Images.	**6**
	Total	**30**

Self-study	Edit Mode and Polygon Fill

Textbooks
2. Pivot_Animator_Help_5-1.pdf (pivotanimator.net)
3. Richard Williams, 2012. *The Animator's Survival Kit*, (3rd Edition), Farrar, Straus and Giroux Publisher.

Reference Books
1. Les Pardew, ross S. Wolfley, 2005. *The Animator's Reference Book*, (1st Edition), Thomson Course Technology.
2. Steve Roberts, 2012, *Character Animation Fundamentals: Developing Skills for 2D*, (Kindle Edition), CRC Press.

3. Harold Whitaker, John Halas, 2013. *Timing for Animation*, (5th Edition), Focal Press.
4. Morr Meroz, 2021. *Animation for Beginners: Getting Started with Animation Filmmaking*, (3rd Edition), Bloop Animation Studios LLC.
5. Francis Glebas, 2012. *Directing the Story*, (2nd Edition), CRC Press.

Web Resources

1. Website: Pivot Animator
2. Websites Reddit
3. Website Droidz.org
4. GitHub
5. PivotAnimation.org

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	2	2	2	3	3	3	2	2
CO2	3	3	2	2	2	2	2	3	3	3	2	2
CO3	3	3	2	1	2	2	2	3	3	3	2	2
CO4	3	3	2	1	2	2	2	3	3	3	2	2
CO5	3	3	2	1	2	2	2	3	3	3	2	2
TOTAL	15	15	10	7	10	10	10	15	15	15	10	10
AVERAGE	3	3	2	1.4	2	2	2	3	3	3	2	2

3 – Strong, 2- Medium, 1- Low

SEMESTER III / V
SELF LEARNING COURSE I: ADOBE ILLUSTRATOR CS4

Course Code	L	T	P	S	Credit	Inst. Hours	Total Hours	CIA	External	Total
								Marks		
SU233SL1/ SU235SL1		-	-	-	1	-	-	25	75	100

Prerequisite:

Familiarity with vector graphics concepts and basic computer skills.

Learning Objectives:

1. To master the tools and techniques for creating and manipulating vector graphics in Adobe Illustrator CS4.
2. To develop proficiency in designing Illustrations, logos, and other graphic elements using advanced features and workflows of adobe Illustrator CS4.

Course Outcomes

On the successful completion of the course, students will be able to:	
1.	recall key features and tools of adobe illustrator and explain the purpose and significance of vector graphics in design.	**K1 & K2**
2.	apply color theory principles to create visually appealing illustrations and designs	**K3**
3.	analyze and troubleshoot common issues encountered during illustrator project	**K4**
4.	assess personal growth and skill development in using adobe illustrator	**K4**
5.	synthesis design concepts and ideas into cohesive and visually appealing compositions using adobe illustrator	**K6**

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyze; **K5** - Evaluate; **K6** – Create

Units	Contents
I	Introduction to Illustrator CS4: The Illustrator CS4 Workspace: The Application Bar – The Control Panel – The Tools Panel – The Document Window – The Panel Groups. Creating New Illustrator Documents.
II	Customizing the Workspace: Creating a New Workspace – Navigating to a Different Workspace – Managing a Workspace. Saving a Document and Quitting the Application. Getting Started with Drawing Tools: Understanding the Basics of Drawing: About Vector Images – About paths.
III	Line Tools in Illustrator: Using Line Segment Tool – Using the Arc Tool – Using the Spiral Tool – Using the Spiral Tool – Using the Rectangular Grid Tool – Using the Polar Grid Tool. Shape Tools in Illustrator: Using the Rectangle Tool – Using the Rounded Rectangle Tool – Using the Ellipse Tool – Using the Polygon Tool – Using the Star Tool – Using the Flare Tool.
IV	Drawing Tools in Illustrator: Using the Pencil Tool – Using the Pen Tool – Using the Blob Brush Tool. Editing Tools in Illustrator: Using the Smooth Tool – Using the Path Eraser Tool – Using the Eraser Tool. Cutting Tools in Illustrator: Using the Scissors Tool – Using the Knife Tool.

V	Working with Objects: Selecting Objects in Illustrator: Using Selection Tool – Using Direct Selection Tool – Using Group Selection Tool – Using Magic Wand Tool – Using Lasso Tool. Editing Objects: Transforming Objects – Aligning Objects – Duplicating Objects.

Textbook
1. Vikas Gupta, 2010. *Comdex DTP Course Kit*, (3rd Edition), Dreamtech Press.

Reference Books
1. Ted Alspach, 2011. *Illustrator CS4 for Dummies.* (3rd Edition). Wiley Publication.
2. Chris Botello, 2009. *Adobe Illustrator CS4 Revealed*, (2nd Edition), Cengage Learning, Delhi.
3. Mordy Golding, 2008. *Real World Adobe Illustrator CS4*, (5th Edition), Pearson Education.
4. Elaine Weinmann, Peter Lourekas, 2009. *Illustrator CS4 for Windows and Macintosh: Visual QuickStart*, (3rd Edition), Pearson Education.
5. Sue Jenkins, 2009. How to Do Everything Adobe Illustrator, (2nd Edition), McGraw-Hill Education.

Web Resources
1. Website: Adobe Help Center Archives
2. Lynda.com
3. Websites: Tuts+
4. Websites: vectips
5. Websites: Adobe Community forums

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	2	2	2	3	3	3	2	2
CO2	3	3	2	2	2	2	2	3	3	3	2	2
CO3	3	3	2	1	2	2	2	3	3	3	2	2
CO4	3	3	2	1	2	2	2	3	3	3	2	2
CO5	3	3	2	1	2	2	2	3	3	3	2	2
TOTAL	15	15	10	7	10	10	10	15	15	15	10	10
AVERAGE	3	3	2	1.4	2	2	2	3	3	3	2	2

3 – Strong, 2- Medium, 1- Low

SEMESTER IV
CORE COURSE IV: .NET PROGRAMMING

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU234CC1	5	-	-	-	5	5	75	25	75	100

Pre-requisite:

     Basic Knowledge on .NET Framework

Learning Objectives:

1. To develop ASP.NET Web application using standard controls.
2. To enable the students to understand the programming features of .Net Framework using ASP.NET and C#.

Course Outcomes

On the successful completion of the course, students will be able to:	
1.	identify and understand the basic syntax and language constructs of C# and .NET framework	K1 & K2
2.	develop console applications using C# to solve simple programming problems.	K3
3.	analyze existing .NET codebases to understand their structure, dependencies, and design patterns.	K4
4.	analyze C# programming techniques in developing web applications.	K4
5.	create web application using various controls.	K6

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyze; **K6** – Create

Units	Contents	No. of Hours
I	ASP.Net 3.5 Essentials: New Features in ASP.Net 3.5 - The ASP.Net Life Cycle - Overview of Visual Studio 2008 - Exploring a sample ASP.Net - Creating a sample ASP.Net Website. Web Forms: Standard Control: The Label Control - The Button Control - The Textbox - The Hidden Field Control - File Upload Control - The Image Control - The ImageMap Control - The ListBox Control - The Drop - Down List Control - The Checkbox Control - The Radio Button Control.	15
II	Navigation Control: The TreeView Control - Creating the TreeView Control - Generating TreeView from a Database - Using the Menu Class - The Menu Control - Creating Static Menus - Creating Dynamic Menus. Validation Control: Introduction - The Required Field Validation Control - The Range Validator Control - The Regular Expression Validator Control - The Compare Validator Control - The Custom Validator Control - The Validation Summary Control.	15
III	Working with Database Controls: The GridView Control - The DataList Control - The DetailsView Control - The FormView Control - The ListView Control - The SqlDataSource Control - The AccessDataSource Control - The ObjectDataSource Control - The XmlDataSource Control. Introducing Login Controls: The Login Control - The LoginView Control - The LoginStatus Control - The LoginName Control - The Password Recovery Control.	15

IV	Introducing C# 2008: Need of C# - C# Preprocessor Directives - New Features of 2008 - Creating A Simple C# 2008 Console Application - Identifiers and Keywords - Data Types, Variables, and Constants - Expressions and Operators. Namespace, Classes, Objects, and Structs: Namespaces - Classes and Objects - Constructors and Destructors – Properties – Indexers -Structs.	**15**
V	Object Oriented Programming: Encapsulation – Inheritance – Polymorphism – Abstraction - Interfaces. Pointers, Delegates and Events: Delegates, Events. Flow Control and Exceptional Handling: Control Flow Statements - Exceptional handling.	**15**
	Total	**75**

Self-study	Inheritance and Constructors

Textbook:
1. Kogent Learning Solutions Inc, 2011. *NET 3.5 Programming - Black Book.* (New Edition). DreamTech Press Publication, New Delhi.Chapters: 26, 29, 30,31,33,39.

Reference Books:
1. Kogent Learning Solutions Inc., 2010. *C# 2008 Programming - Black Book.* (Platinum Edition). DreamTech Press Publications, New Delhi.
2. Reynald Adolphe, 2016. *Expert Programming In C# and .Net*. (2nd Edition). Packt Publication, Bangalore.
3. Richaro Peres, 2016. *Entity Framework Core Cookbook*. (2nd Edition). Packt Publication, Bangalore.
4. Matthew Mac, Donald and Màrio Szpuszta, 2008. *Pro Asp.Net 3.5 in C# 2008*. (2nd Edition). Apress Publication, Hariyana
5. Jeff Martin, 2016. *Visual Studio 2015*. (2nd Edition), Packt Publication, Bangalore.

Web Resources:
1. Web resources from NDL Library, E-content from open-source libraries
2. Opensource digital libraries: .Net Programming
3. https://www.geeksforgeeks.org/introduction-to-net-framework/
4. official website
5. https://www.javapoint.com/net-framework

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	2	2	2	3	3	3	2	2
CO2	3	3	2	2	2	2	2	3	3	3	2	2
CO3	3	3	2	1	2	2	2	3	3	3	2	2
CO4	3	3	2	1	2	2	2	3	3	3	2	2
CO5	3	3	2	1	2	2	2	3	3	3	2	2
TOTAL	15	15	10	7	10	10	10	15	15	15	10	10
AVERAGE	3	3	2	1.4	2	2	2	3	3	3	2	2

3 – Strong, 2- Medium, 1- Low

SEMESTER IV
CORE LAB COURSE IV: .NET PROGRAMMING

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU234CP1	-	-	5	-	5	5	75	25	75	100

Pre-requisite:
> Basic knowledge on .NET framework

Learning Objectives:
1. To develop ASP.NET Web application using standard controls.
2. To enable the students to understand the programming features of .Net Framework using ASP.NET and C#.

Course Outcomes

On the successful completion of the course, students will be able to:		
1.	identify and understand the basic syntax and language constructs of C# and .NET framework	K1 & K2
2.	develop console applications using C# to solve simple programming problems.	K3
3.	analyze existing .NET codebases to understand their structure, dependencies, and design patterns.	K4
4.	analyze C# programming techniques in developing web applications.	K4
5.	create web application using various controls.	K6

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyze; **K6** - Create

List of Exercises	No. of Hours
Visual C# 1. Designing an application to work with Class and Object 2. Designing an application to work with Constructor 3. Designing an application to work with Single Dimensional Arrays 4. Designing an application with Method Overload 5. Designing an application to work with Inheritance 6. Designing an application to work with Exception handling **ASP.NET** 1. Designing a Webpage using standard Web Forms Application 2. Designing Application with Navigation Controls 3. Designing application to work with databases 4. Program using Gridview Control. 5. Developing an application using Validation Controls. 6. Designing a Webpage using Login Controls.	75

Textbook
1. Kogent Learning Solutions Inc., (2011). *NET 3.5 Programming - Black Book.* (New Edition). New Delhi: DreamTech Press Publication. Chapters: 26, 29, 30,31,33,39.

Reference Books
1. Kogent Learning Solutions Inc., 2010. *C# 2008 Programming - Black Book.* (Platinum Edition). New Delhi: DreamTech Press Publications.
2. Reynald Adolphe, 2016. *Expert Programming in C# and .Net.* (2nd edition). Bangalore: Packt Publication.

3. Richaro Peres, 2016. *Entity Framework Core Cookbook*. (2nd edition). Bangalore: Packt Publication.
4. Matthew Mac, Donald and Màrio Szpuszta, 2008. *Pro Asp.Net 3.5 in C# 2008*. (2nd edition). Hariyana: Apress Publication.
5. Jeff Martin, 2016. *Visual Studio 2015*. (2nd edition), Bangalore: Packt Publication.

Web Resources
1. Web resources from NDL Library, E-content from open-source libraries
2. Opensource digital libraries: .Net Programming
3. https://www.geeksforgeeks.org/introduction-to-net-framework/
4. official website
5. https://www.javapoint.com/net-framework

**MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	2	2	2	3	3	3	2	2
CO2	3	3	2	2	2	2	2	3	3	3	2	2
CO3	3	3	2	1	2	2	2	3	3	3	2	2
CO4	3	3	2	1	2	2	2	3	3	3	2	2
CO5	3	3	2	1	2	2	2	3	3	3	2	2
TOTAL	15	15	10	7	10	10	10	15	15	15	10	10
AVERAGE	3	3	2	1.4	2	2	2	3	3	3	2	2

3 – Strong, 2- Medium, 1- Low

SEMESTER IV
ELECTIVE COURSE IV: SOFTWARE ENGINEERING

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	CIA	External	Total
									Marks	
SU234EC1	4	-	-	-	3	4	60	25	75	100

Pre-requisite:

Basic knowledge in programming, software design principles and communication skills.

Learning Objectives:

1. To understand the basics of modular programming and how to create reusable code components.
2. To learn how to collaborate effectively with team members and gain proficiency in debugging techniques to identify and fix software bugs efficiently.

Course Outcomes

On the successful completion of the course, students will be able to:	
1.	recall fundamental concepts and principles of software engineering, including software development life cycle models, requirements engineering, and software design patterns.	**K1**
2.	understand the principles of software testing, including test planning, test case design, and test execution.	**K2**
3.	apply requirements engineering techniques to gather, analyze, and document software requirements for a given project.	**K3**
4.	analyze software requirements documents to identify inconsistencies, ambiguities, and conflicts.	**K4**
5.	create comprehensive test plans, test cases, and test scripts to ensure the quality and reliability of software systems.	**K6**

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyze; **K6** – Create

Units	Contents	No. of Hours
I	Introduction to Software Engineering: The Evolving role of Software - Changing Nature of Software - Software Myths - A Generic view of process: Software Engineering – A Layered Technology - A Process Framework - The Capability Maturity Model Integration (CMMI) - Process Models: The Waterfall Model - Spiral Model and Agile Methodology.	12
II	Software Requirements: Functional and Non-functional Requirements - User Requirements - System Requirements - Interface Specification - The Software Requirements Document - Requirements Engineering Process: Feasibility Studies - Requirements Elicitation and Analysis - Requirements Validation - Requirements Management.	12
III	Design Engineering: Design Process and Design Quality - Design Concepts - The Design Model - Creating an Architectural Design: Software Architecture - Data Design - Architectural Styles and Patterns - Architectural Design - Conceptual Model of UML - Basic Structural Modeling - Class Diagrams - Sequence Diagrams - Collaboration Diagrams - Use Case Diagrams - Component Diagrams.	12

IV	Testing Strategies: A Strategic Approach to Software Testing – Strategic Issues – Test Strategies for Conventional Software – Test Strategies for Object Oriented Software – Validation Testing – System Testing – Art of debugging – Testing Tactics: Software Testing Fundamentals – White-Box Testing – Basis Path Testing – Control Structure Testing – Black-Box Testing	12
V	Risk management: Reactive Vs Proactive Risk Strategies - Software Risks - Risk Identification - Risk Projection - Risk Refinement - RMMM. Quality Management: Quality Concepts - Software Quality Assurance - Software Reviews - Formal Technical Reviews - Statistical Software Quality Assurance - Software Reliability - The ISO 9000 Quality Standards.	12
	Total	**60**

Self-study	Process Model: Waterfall model and Spiral model

Textbooks:
1. Roger S. Pressman, 2005. *Software Engineering, A Practitioner's Approach*, (6th Edition), McGraw Hill International Edition.
2. Ian Sommerville, 2008. *Software Engineering*, (7th Edition), Pearson Education

Reference Books:
1. Grady Booch, James Rambaugh, Ivar Jacobson, 2005. *The Unified Modeling Language User Guide*, Addison-Wesley.
2. James F. Peters, Witold Pedrycz, 2000. *Software Engineering, An Engineering Approach (1st edition),* John Wiley & Sons
3. Waman S Jawadekar, 2004. *Software Engineering: Principles and Practice,* The McGraw Hill Companies.
4. Meilir Page-Jones, 2008. *Fundamentals of Object-Oriented Design using UML*, Pearson Education.
5. Capers Jones, 2013. The Technical and Social History of Software Engineering, Addison-Wesley.

Web Resources:
1. https://www.javatutorialpoints.com
2. https://www.guru99.com/python-tutorials.html
3. https://www.w3schools.com/software engineering
4. https://www.geeksforgeeks.org
5. https://en.wikipedia.org/wiki/software engineering

**MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	2	2	2	3	3	3	2	2
CO2	3	3	2	2	2	2	2	3	3	3	2	2
CO3	3	3	2	1	2	2	2	3	3	3	2	2
CO4	3	3	2	1	2	2	2	3	3	3	2	2
CO5	3	3	2	1	2	2	2	3	3	3	2	2
TOTAL	15	15	10	7	10	10	10	15	15	15	10	10
AVERAGE	3	3	2	1.4	2	2	2	3	3	3	2	2

3 – Strong, 2- Medium, 1- Low

SEMESTER III / IV
SKILL ENHANCEMENT COURSE SEC IV: DIGITAL FLUENCY

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
UG23CSE2	**2**	-	-	-	**2**	**2**	**30**	**50**	**50**	**100**

Pre-requisite: Basic computer knowledge
Learning Objectives:
1. To provide a comprehensive suite of productivity tools that enhance efficiency
2. To build essential soft skills that are needed for professional success.
Course Outcomes

On the successful completion of the course, students will be able to:		
1.	work with text, themes and styles	**K1**
2.	produce a mail merge	**K2**
3.	secure information in an Excel workbook	**K2**
4.	perform documentation and presentation skills	**K2, K3**
5.	add special effects to slide transitions	**K3**

K1 - Remember; **K2** - Understand; **K3** – Apply

Units	Contents	No. of Hours
I	**Microsoft Word 2010:** Starting Word 2010 - Understanding the Word Program Screen - Giving Commands in Word - Using Command Shortcuts – Document: Creating - Opening - Previewing - Printing and Saving. Getting Started with Documents: Entering and Deleting Text - Navigating through a Document - Viewing a Document. Working with and Editing Text: Spell Check and Grammar Check- Finding and Replacing Text - Inserting Symbols and Special Characters – Copying, Moving, and Pasting Text.	**6**
II	**Formatting Characters and Paragraphs**: Changing Font Type, Font Size, Font Color, Font Styles and Effects, Text Case, Creating Lists, Paragraph Alignment, Paragraph Borders and Shadings, Spacing between Paragraphs and Lines. Formatting the Page: Adjusting Margins, Page Orientation and Size, Columns and Ordering, Headers and Footers, Page Numbering. Working with Shapes, Pictures and SmartArt: Inserting Clip Art, Pictures and Graphics File, Resize Graphics, Removing Picture's Background, Text Boxes, Smart Art, Applying Special Effects. Working with Tables: Create Table, Add and delete Row or Column, Apply Table Style - Working with Mailings.	**6**
III	**Microsoft Excel 2010:** Creating Workbooks and Entering Data: Creating and Saving a New Workbook - Navigating the Excel Interface, Worksheets, and Workbooks - Entering Data in Worksheets - Inserting, Deleting, and Rearranging Worksheets. Formatting Worksheets: Inserting and Deleting Rows, Columns and Cells - Formatting Cells and Ranges - Printing your Excel Worksheets and Workbooks. Crunching Numbers with Formulas and Functions: Difference between Formulae and Functions - Applying Functions. Creating Powerful and Persuasive Charts: Creating, Laying Out, and Formatting a Chart.	**6**
IV	**Microsoft PowerPoint 2010:** Creating a Presentation - Changing the Slide Size and	**6**

	Orientation - Navigating the PowerPoint Window - Add content to a Slide - Adding, Deleting, and Rearranging Slides - Using views to work on Presentation. Creating Clear and Compelling Slides: Planning the Slides in Presentation - Choosing Slide Layouts to Suit the Contents - Adding Tables, SmartArt, Charts, Pictures, Movies, Sounds, Transitions and Animations - Slideshow.	
V	**Digital Platforms:** Graphic Design Platform: Canva - Logo Making, Invitation Designing. E-learning Platform: Virtual Meet – Technical Requirements, Scheduling Meetings, Sharing Presentations, Recording the Meetings. Online Forms: Creating Questionnaire, Publishing Questionnaire, Analyzing the Responses, Downloading the Response to Spreadsheet.	**6**
	Total	**30**

Self-study	Parts of a computer and their functions

Textbook:

1. Anto Hepzie Bai J. & Divya Merry Malar J.,2024, Digital Fluency, Nanjil Publications, Nagercoil.

Reference Books:

1. Steve Schwartz, 2017, *Microsoft Office 2010 for Windows,* Peachpit Press.
2. Ramesh Bangia, 2015, Learning Microsoft Office 2010, Khanna Book Publishing Company.
3. Bittu Kumar, 2018, *Mastering MS Office*, V & S Publishers.
4. James Bernstein, 2020, *Google Meet Made Easy*, e-book, Amazon.
5. Zeldman, Jeffrey, 2005, *Web Standards Design Guide*, Charles River Media.

Web Resources:

1. https://www.youtube.com/watch?v=oocieLn6umo
2. https://www.youtube.com/watch?v=pPSwbK4_GdY
3. https://www.youtube.com/watch?v=DKAiSDhU4To
4. https://www.youtube.com/watch?v=sbeyPahs-ng
5. https://www.youtube.com/watch?v=fACEzzmXelY

SEMESTER IV
ENVIRONMENTAL STUDIES

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
UG234EV1	2	-	-	-	2	2	30	25	75	100

Pre-requisite: Interest to learn about nature and surrounding.

Learning Objectives

1. To know the different types of pollutions, causes and effects
2. To understand the importance of ecosystem, resources and waste management

Course Outcomes

On the successful completion of the course, students will be able to:	
1. know the different kinds of resources, pollution and ecosystems	**K1**
2. understand the biodiversity and its constituents	**K2**
3. use the methods to control pollution and, to conserve the resources and ecosystem	**K3**
4. analyse the factors behind pollution, global warming and health effects for sustainable development	**K4**
5. evaluate various water, disaster and waste management systems	**K5**

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyse; **K5** - Evaluate

Units	Contents	No. of Hours
I	**Nature of Environmental Studies** Multidisciplinary nature of environmental studies- scope of environmental studies - environmental ethics-importance- types- natural resources - renewable and non-renewable resources – forest, land, water and energy resources.	**6**
II	**Biodiversity and its Conservation** Definition: genetic, species of biodiversity - biodiversity hot-spots in India - endangered and endemic species of India – Red Data Book - In-situ and Ex-situ conservation of biodiversity. Ecosystem- types - structure and function - food chain - food web- ecological pyramids- forest and pond ecosystems.	**6**
III	**Environmental Pollution** Pollution - causes, types and control measures of air, water, soil and noise pollution. Role of an individual in prevention of pollution. Solid waste management: Causes, effects and control measures of urban and industrial wastes. Disaster management– cyclone, flood, drought and earthquake.	**6**
IV	**Environmental Management and Sustainable Development** From unsustainable to sustainable development -Environmental Law and Policy – Objectives; The Water and Air Acts-The Environment Protection Act -Environmental Auditing-Environmental Impact Assessment-Life Cycle Assessment- Human Health Risk Assessment, Water conservation, rain water harvesting, watershed management.	**6**
V	**Social Issues and the Environment** Population explosion-impact of population growth on environment and social environment. Women and Child Welfare, Role of information technology in environment and human health. Consumerism and waste products. Climate change - global warming, acid rain and ozone layer depletion.	**6**

	Field work: Address environmental concerns in the campus (or) Document environmental assets- river / forest / grassland / hill / mountain in the locality (or) Study a local polluted site-urban / rural / industrial / agricultural area.	
	Total	**30**

Self-study	Pollutants, Ecosystems and Resources

Textbook
1. Punitha A and Gladis Latha R, 2024. Fundamentals of Environmental Science.

Reference Books
1. Agarwal, K.C., 2001. *Environmental Biology*, Nidi Publishers. Ltd. Bikaner.
2. Brunner R.C., 1989, *Hazardous Waste Incineration*, McGraw Hill Ltd.
3. Gorhani, E & Hepworth, M.T. 2001. *Environmental Encyclopedia*, Jaico Publ. House, Mumbai.
4. De A.K.,2018. *Environmental Chemistry*, Wiley Eastern Ltd.
5. Gleick, H.P. 1993. *Water in crisis*, Pacific Institute for Studies Oxford Univ. Press.

Web Resources
1. https://www.sciencenews.org/topic/environment
2. https://news.mongabay.com/2024/05/
3. https://www.sciencedaily.com/news/earth_climate/environmental_issues/
4. https://wildlife.org/rising-oryx-numbers-may-distress-new-mexico-ecosystem/
5. https://phys.org/news/2024-02-global-wild-megafauna-ecosystem-properties.html

SEMESTER III & IV
LIFE SKILL TRAINING II: CATECHISM

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
UG234LC1	1	-	-	-	1	1	15	50	50	100

Learning Objectives:
1. To develop human values through value education
2. To understand the importance of personal development to lead a moral life

Course Outcomes

On the successful completion of the course, students will be able to:	
1	know and understand the aim and importance of value education	**K1,K2**
2	get rid of inferiority complex and act confidently in the society	**K3**
3	live lovingly by facing loneliness and make decisions on their own	**K3**
4	develop human dignity and able to stand bravely in adversity	**K6**
5	learn unity in diversity and grow in a life of grace	**K6**

K1 - Remember **K2**-Understand; **K3**-Apply; **K6**- Create

Units	Contents	No. of Hours
I	**Face Loneliness:** Loneliness – Causes for Loneliness – Loneliness in Jesus Christ Life – Ways to Overcome Loneliness – Need and Importance Bible Reference: Matthew: 6:5-6	**3**
II	**Inferiority Complex:** Inferiority Complex - Types – Ways to Get Rid of Inferiority Complex – Words of Eric Menthol – Balanced Emotion – Jesus and his Disciples. Bible Reference: Luke 8:43-48	**3**
III	**Decision Making:** Importance of Decision Making – Different Steps – Search – Think – Pray – Decide- Jesus and his Decisions Bible Reference: Mathew 7:7-8 **Independent:** Freedom from Control – Different Types of Freedom - Jesus the Liberator Bible Reference: Mark 10:46-52	**3**
IV	**Human Dignity:** Basic Needs – Factors that Degrade Human Dignity – How to Develop Human Dignity. Bible Reference: Luke 6:20-26 **Stand Bravely in Adversity:** Views of Abraham Maslow – Jesus and his Adversity. Bible Reference: Luke 22:43	**3**
V	**Unity in Diversity:** Need for Unity – The Second Vatican Council on the Mission of Christian Unity. Bible Reference: I Corinthians 1:10 **To Grow in a Life of Grace:** Graceful Life – View of Holy Bible – Moses – Amos – Paul – Graceful Life of Jesus Bible Reference: Amos 5:4	**3**
	TOTAL	**15**

Textbooks

1. *Valvukku* Valikattuvom, Christian Life Committee, Kottar Diocese

2. The Holy Bible

SEMESTER III & IV
LIFE SKILL TRAINING II: MORAL

Course Code	L	T	P	S	Credits	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
UG234LM1	1	-	-	-	1	1	15	50	50	100

Learning Objectives:

1. To cultivate human values through value education
2. To comprehend the importance of humane and morals to lead ethical and moral life.

Course Outcome

On the successful completion of the course, students will be able to:	
1	know the significance of life	**K1**
2	understand the importance of self-care	**K2**
3	realise the duty of youngsters in the society and live up to it	**K3**
4	analyse how to achieve success in profession	**K4**
5	develop mystical values by inculcating good thoughts	**K5**

K1 - Remember; K2 - Understand; K3 – Apply; K4 - Analyse; K5 – Evaluate

Unit	Contents	No. of Hours
I	**Edu Care:** Introduction- -Personal Care-Temple of Mind-Emotional stability- Inner views- Internal and external Beauty- Life is a Celebration	3
II	**Self-care:** Self- discipline- Selfishness in doing good things- Adolescence stage- What am I? - Self-esteem- Self-Confidence- Respect for womanhood	3
III	**Profession based Values:** Time Management-Continuous effort- What next? –Present moment is yours, Hard work and Smart Work-Broad view- destruct your failures	3
IV	**Mystical Values:** Thoughts- Positive and negative thoughts- Origin of negative thoughts-Moralisation of needs- Elimination of obstacles	3
V	**Society and you:** Knowing Humanity-Thankfulness- love and happiness-Honesty- Heroism -Youth is gift of God-Youngsters in politics and social media utilization.	3
TOTAL		**15**

Textbook

2. "Munaetrathin Mugavari", G. Chandran, Vaigarai Publisher.

SEMESTER IV/VI
SELF LEARNING COURSE II: WEB ANIMATION

Course Code	L	T	P	S	Credit	Inst. Hours	Total Hours	Marks		
								CIA	External	Total
SU234SL1/ SU236SL1	-	-	-	-	1	-	-	**25**	**75**	**100**

Prerequisite:
Basic understanding of web development and animation concepts.

Learning Objectives:
1. To understand the principles of timing, easing and sequencing in web animation.
2. To gain proficiency in using CSS and JavaScript libraries/frameworks for creating interactive and visually appealing web animations.

Course Outcomes

On the successful completion of the course, students will be able to:	
1.	remember and understand HTML structure, tags, and saving web pages.	**K1 & K2**
2.	utilize CSS for image styling and text wrapping.	**K3**
3.	analyse and create various types of hyperlinks and use CSS.	**K3 & K4**
4.	learn and evaluate pose-to-pose sketching, rapid sketching, and basic acting.	**K4 & K5**
5.	develop master pencil shading, textures, landscapes, and human anatomy.	**K6**

K1 - Remember; **K2** - Understand; **K3** – Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Units	Contents
I	Introduction: Define HTML and HTML 5 - Getting started with tags – Saving web pages - Viewing your web pages - Basic HTML Tags - Basic HTML template - Heading Tags - Paragraph and Break tags - Bold and Italics - HTML lists
II	Dealing with Images: Types of Images - Inserting Images - Image Attributes - Images and CSS - Text wrapping with CSS - CSS and image borders - Background Images - Adding Captions to Images.
III	Linking to other Pages: Hyperlinks - Linking to other Pages - Other Types of Hyperlinks - CSS and Hyperlinks - External Stylesheets – Inline Stylesheets – Internal Stylesheets.
IV	Introduction to pose to pose sketching: Rapid sketching from live Models - Introduction to Acting – Modeling - Sketching from Acting - Sketching from live Models - Introduction to Rapid Sketching Techniques - Sketching from Memory - Live Action - Basics of Acting - Style Breaking - Movements.
V	Shading in Different Angles of Pencil Strokes - Formatting in Different Textures with Pencil – Shading - Simple Objects in Drawing - Simple Shapes of Geometrical Shapes – Roadsides – Rivers - Perspective in Lines in Landscapes - Different Head Shapes – Characters - Human Anatomy

Textbooks
1. Thomas A. Powell, 2010. *HTML & CSS: The complete Reference*, (5th Edition), Osborne/McGraw Hill Reference.
2. Ethan Watrall, Jeff Siarto, 2009. *Head First Web Design*, (4th Edition), O'Reilly Media.
3. Roger King, 2015. *3D Animations for the Raw Beginner Using Maya*, (5th Edition), CRC Press Publisher.

Reference Books
2. Tod Polson, 2013. *The Noble Approach: Maurice Noble and the Zen of Animation Design*, (5th Edition), Chronicle Books LLC.
3. Kirupa Chinnathambi, 2017. *Creating Web Animations: Bringing Your UIs to Life*, (4th Edition), O'Reilly Media.
4. Julian Shapiro, 2015. *Web Animation Using JavaScript: Develop and Design*, (5th Edition), PeachpitPress Publisher.
5. Les Pardew, Ross S. Wolfley, 2005. *The Animator's Reference Book*, (3rd Edition), Thomson Course Technology.
6. Steven Bradley, 2014. *CSS Animations and Transitions for the Modern Web*, (2nd Edition), Pearson Education.

Web Resources
1. Website: MDN Web Docs - Animation
2. Website: CSS-Tricks
3. Website: GreenSock Documentation
4. Website: CodePen
5. Website: Aen Animation API

MAPPING WITH PROGRAMME OUTCOMES
AND PROGRAMME SPECIFIC OUTCOMES

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	2	2	2	2	3	3	3	2	2
CO2	3	3	2	2	2	2	2	3	3	3	2	2
CO3	3	3	2	1	2	2	2	3	3	3	2	2
CO4	3	3	2	1	2	2	2	3	3	3	2	2
CO5	3	3	2	1	2	2	2	3	3	3	2	2
TOTAL	15	15	10	7	10	10	10	15	15	15	10	10
AVERAGE	3	3	2	1.4	2	2	2	3	3	3	2	2

3 – Strong, 2- Medium, 1- Low